

NEW MEXICO STATE UNIVERSITY



LAS CRUCES CAMPUS ACADEMIC CATALOG 2023-2024

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RXPP-PRESCRIP PRIV PRAC PSYCH	1904
SIGN-SIGN LANGUAGE	1906
SMET-SCIENCE/MATH/ENG/TECH	1907
SOCI-SOCIOLOGY	1908
SOIL-SOIL	1914
SOWK-SOCIAL WORK	1916
SPAN-SPANISH	1923
SPED-SPECIAL EDUCATION	1936
SPHS-SPEECH & HEARING SCIENCE	1954
SPMD-SPORTS MEDICINE	1959
STAT-STATISTICS	1974
SUR-SURVEYING	1975
SURG-SURGICAL TECHNOLOGY	1977
TBGD-TRANSBORDER & GLOBAL HUMAN DYNAMICS	1978
TCEN-ENVIRONMENTAL/ENERGY TECH	1979
THEA-THEATER	1982
TOX-TOXICOLOGY	1987
UNIV-UNIVERSITY STUDIES	1987
WATR-WATER UTILITIES	1987
WELD-WELDING TECHNOLOGY	1988
WSAM-WATER SCIENCE & MGT	1990
Index	1992

LAS CRUCES ACADEMIC CATALOG

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

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

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

The academic program requirements of each catalog are effective for a period of eight academic years. This 2023-2024 Catalog is effective summer 2023 through spring semester 2031. All other catalog content, including rules, regulations, course descriptions and prerequisites are effective only for the catalog's denoted academic year. While content changes are typically implemented between Catalog years, the catalog does not represent a contract and NMSU reserves the right to make modifications to the catalog at any time.

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

Associate Registrar: Gabrielle Martinez

Graduation & Curriculum Data Specialist: Daniela Lucero

University Leadership

NEW MEXICO STATE UNIVERSITY

Chancellor

TBD, Chancellor

Board of Regents

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

Ammu Devasthali, Appointed Regent from Las Cruces, NM for term December 31, 2028.

Deborah Romero, Appointed Regent from Santa Fe, NM for term December 31, 2026.

Christopher Saucedo, Appointed Regent from Albuquerque, NM for term expiring December 31, 2026.

Dina Chacón-Reitzel, Appointed Regent from Albuquerque, NM for term expiring December 31, 2024.

Garrett Moseley, Appointed Student Regent for term expiring December 31, 2024.

Provost/Academic

Shoho, Alan, Senior VP & Provost

Gray, Tara, Associate Provost for Faculty Development

McAteer, James, Associate Provost for Academic Affairs

Stovall, Shelly, Associate Provost for Institutional Effectiveness

Turner, Patrick, Associate Provost for Student Success

Vice Chancellor/Presidents/Provosts

Cifuentes, Luis, VP Research

Dictson, Derek, VP University Advancement

Johnston, Ruth, Vice Chancellor & COO

Kollmann, Sherry, Associate Vice Chancellor for Digital Learning

Scott, Renay, VP Student Success

Van Winkle, Kenneth, Associate Vice Chancellor External Relations/ Economic Development & Branch Executive Director

Deans

Camarena, Phame, Dean, Honors College and Crimson Scholars & Interim Dean of the Graduate School

Comerford, Kevin, Dean, Library

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

Ashenbaum, Bryan, Dean, Business College

Iwasaki, Yoshitaka, Dean, Health, Education and Social Transformation College

Pontelli, Enrico., Dean, Arts and Sciences College

Reddi, Lakshmi, Dean, Engineering College

COMMUNITY COLLEGES ADMINISTRATION

Alamogordo

Cal, Mark P., VP Academic Affairs

TBD, VP Student Success

Salinas, Antonio A., VP Business & Finance

Dona Ana

Torres, Monica F., Campus President

Brooks, Kelly, VP Business & Finance

Woodley, Xeturah, VP Academic Affairs

Ledesma, Amadeo "Ike," VP Student Services

Grants

Chavez-Toivanen, Marlene, VP Academic Affairs

Clingman, Patrick, VP Student Services

The History of the University

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

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

Mission

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

Vision

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

Values

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

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

Accreditation

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

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

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

NMSU Graduation and Retention Rates

These rates may be found on the NMSU Institutional Research web site at: <https://oia.nmsu.edu/>.

Programs A-Z

Academic Programs

Associate Degree Programs

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

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

Las Cruces Campus

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

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

Designated Associate Degrees

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

- **Associate in Art and Graphic Design**
Administered by the Community Colleges
- **Associate in Criminal Justice**
Administered by the Community Colleges
- **Associate in Education**
Administered by the Community Colleges

- **Associate in Pre-business**
Administered by the College of Business
- **Associate of Arts in Heritage Interpretation**
Administered by the Community Colleges

Community Colleges

Many of the associate degrees offered on Las Cruces campus, as well as other programs, are available at NMSU's three community college campuses. For more information on community college campus offerings, refer to the "Community Colleges (p. 1329)" chapter in this catalog and to their respective catalogs or admissions offices.

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

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

Undergraduate Programs

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

Graduate Degree Programs

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

Academic Minors

Students seeking a degree may elect to complete one or more minors from those available, and the minor will be designated on their transcripts. Minors cannot be earned after the degree has been conferred. The minor may be in a single department or may be interdepartmental. Specific requirements for these minors are available in printed form in departmental and deans' offices. See the College sections for a each Colleges complete list of the minors they offer.

Programs offered at New Mexico State University

Program are titled in the following styles:

- **Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture**
 - Major Title (Agricultural Biology), will appear on diplomas and transcripts
 - Concentration Title (Applied Biology), will appear on diplomas and transcripts
 - Degree Title (Bachelor of Science in Agriculture), will appear on diplomas and transcripts
- **Animation and Visual Effects - Bachelor of Creative Media***
 - Major Title (Animation and Visual Effects), will appear on diplomas and transcripts
 - Degree Title (Bachelor of Creative Media), will appear on diplomas and transcripts
- **Sociology - Bachelor of Arts (Online)**
 - Major Title (Animation and Visual Effects), will appear on diplomas and transcripts

- Degree Title (Bachelor of Creative Media), will appear on diplomas and transcripts
- Online, these programs are a part of the NMSU-Online campus

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

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

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- Accounting - Master of Accountancy (p. 89)
- Accounting - Undergraduate Minor (p. 856)
- Advanced Manufacturing - Graduate Minor (p. 212)
- Advertising - Undergraduate Minor (p. 917)
- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 1071)
- Aerospace Engineering - Doctor of Philosophy (p. 173)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 90)
- Aerospace Engineering - Master of Science (p. 90)
- Aerospace Engineering - Undergraduate Minor (p. 1074)
- Aerospace Studies - Undergraduate Minor (p. 431)
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- Animal Science (Science) - Bachelor of Science in Agriculture (p. 314)
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- Anthropology - Bachelor of Arts (p. 450)
- Anthropology - Graduate Minor (p. 212)
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- Anthropology - Undergraduate Minor (p. 456)
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- Applied Statistics - Graduate Minor (p. 212)
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- Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies (p. 1266)
- Applied Studies - Bachelor of Applied Studies (<http://catalogs.nmsu.edu/nmsu/arts-sciences/applied-studies-bachelor-applied-studies/>)
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- Art (Studio Art) - Bachelor of Fine Arts (p. 479)
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- Chemistry - Bachelor of Science (p. 529)
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Catalog Glossary

A

Academic Calendar

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

Academic College:

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

Academic Course:

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

Academic Department:

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

Academic Integrity:

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

Academic Probation I:

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

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

Academic Probation II:

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

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

Academic Standing:

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

- Good standing
- Warning
- Probation I

- Probation II
- Suspension

Academic Suspension:

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

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

Academic Warning (Undergraduate Only):

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

Academic Year

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

Accreditation / Accredited:

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

Admission:

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

Adjusted Credit Option (ACO):

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

Administrative Withdrawal:

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

Advanced Placement (AP):

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

Advising Document:

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

Advisor:

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

Articulation:

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

Articulation Agreement:

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

Associate Degree (AA/AS/AAS):

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

Asynchronous Class (WB):

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

Audit:

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

B

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

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

Basic Skills:

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

C

Career Technical Courses (CTE):

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

Catalog:

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

Catalog Year:

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

Canvas (Learning Management System):

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

CCN (State of NM Common Course Number):

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

Certificate:

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

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

Challenge Exam:

Any enrolled student with a cumulative GPA of at least 2.0 currently attending classes may, with permission of the appropriate department, challenge by examination any undergraduate course in which credit has not been previously earned except an independent study, research or reading course, or any foreign language course that precedes the final course in the lower-division sequence. The fee for challenging a course

is the same as the approved tuition rate. Courses may not be challenged under the S/U option.

Class:

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

Class Delivery Modes:

Classes at NMSU are delivered in a variety of modalities.

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

Classification:

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

- Freshman (1 – 28 credit hours)
- Sophomore (29 – 59 credit hours)
- Junior (60 – 89 credit hours)
- Senior (90+ credit hours)
- Masters (Master level degree program)
- Doctoral (Doctoral level degree program)
- Non-degree seeking
- Dual credit (concurrent high school enrollment)

Clinical:

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

Cohort:

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

College:

See "Academic College"

College Level Examination Program (CLEP):

A group of standardized tests assessing college-level knowledge. At NMSU, CLEP scores may be evaluated for academic transfer credit.

Commencement:

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

Community College:

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

Completion Rate:

Ratio of courses completed versus attempted.

Concentration:

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

Consent of Instructor:

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

Corequisite:

Courses that students must register for at the same time.

Course:

See "Academic Course"

Course Exception:

An exemption from a required course because competencies and/or learning objectives of the course have been, demonstrably, attained.

An exception removes the course, and its associated credits, from a student's degree program requirements. All substitutions must be approved the Academic Associate Dean of the College awarding the degree.

Course Substitution:

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

Credit Hour:

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

Credit for Prior Learning (CPL):

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

CRN (Course Reference Number):

A five digit number identifying a particular class being offered for student registration.

D**Dean / Associate Dean (Academic):**

The title of an administrative position in charge of an Academic College.

Dean of Students:

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

Dean's List:

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

Degree:

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

Degree Audit (DARS / STAR):

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

Department:

See "Academic Department"

Department Head / Department Chair:

The title of an administrative position in charge of an Academic Department.

Developmental Courses:

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

Diploma:

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

Dropping/Withdrawing from Courses:

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

Doctoral Degree:

A degree requiring significant scholarly study beyond the master's. The individualized program of study is designed to meet the campus residency requirement and includes a minimum of 30 graduate

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

Dual Credit:

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

E

Elective:

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

Enrollment:

Process by which students formally select classes each term.

Exception:

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

Experiential Learning:

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

F

Faculty (Instructor):

Any employee who teaches classes at an educational institution.

Fees:

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

FERPA (Family Educational Rights and Privacy Act):

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

Financial Aid:

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

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

FAFSA (Free Application for Federal Student Aid):

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

Fractional Grading:

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

Freshman:

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

Full-time:

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

G

General Education (GE):

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

General Education (GE) Certification:

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

Grade Appeals:

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

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

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

Grade Mode:

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

Grade Point Average (GPA):

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

Grading System:

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

Graduate Certificate:

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

Graduate level:

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

Graduation:

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

Graduation with Honors:

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

Graduation with High Honors:

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

Graduation with Highest Honors:

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

H

Hybrid class:

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

I

Incomplete (I) Grade:

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

Independent Study:

Individualized learning, which allows student to work independently under the supervision of an assigned instructor on specific topics directly

related to a course or program of study. The meeting time is arranged between the student and instructor.

Instructor (Faculty):

Any employees who teaches classes at an educational institution.

Internship / Co-op:

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

J

Junior:

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

L

Lab:

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

Late Registration Fee:

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

Lecture (Class):

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

Lower Division:

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

M

Master's Accelerated Program (MAP):

An opportunity for select undergraduate students to take graduate level courses that will apply to their future graduate degree at NMSU.

Master's Degree:

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

Major:

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

Maximum Time Frame:

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

Military Duty:

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

Minor:

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

my.NMSU:

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

N**New Mexico State University Online (NMSU-O / UO):**

Fully online degree programs and support services for online learners under the University campus.

New Mexico State University System:

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

Non-Degree Status:

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

No Release of Information:

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

O**Official Transcript:**

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

P**Part-time:**

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

Placement Exams:

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

Practicum:

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

Prerequisite:

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

Prior Learning Assessment (PLA):

See "Credit for Prior Learning (CPL)".

Priority Registration Dates:

One

Probation:

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

Program of Study:

See "Major".

Public Directory Information:

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

- Name
- Aggie ID number
- Class (i.e. Freshman, Sophomore, Junior, Senior)
- College and major
- Dates of attendance
- Degree(s) earned
- Honors and awards received, including selection to the dean's or chancellor's list, honorary organization, or the GPA range for the selection
- Address
- Telephone number
- NMSU e-mail address

- Most recent previous educational institution attended
- Participation in officially recognized activities and sports
- The weight and height and age of members of athletic teams

Q R

Readmission

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

Registration:

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

Repeating a Course for Credit:

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

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

Restriction (Registration):

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

Residency for Tuition Purposes:

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

Residency Requirement:

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

S

Satisfactory Academic Progress (SAP):

Federal regulations require all students receiving financial aid to meet Satisfactory Academic Progress in order to maintain eligibility for financial aid. Undergraduate students must maintain a 2.0 cumulative GPA or greater on all hours attempted at NMSU. Graduate students must maintain a 3.0 cumulative GPA or greater. Undergraduate and Graduate students are required to pass and complete 70% of all hours attempted. Students receiving financial aid must complete their program

of study within a reasonable timeframe. The maximum timeframe is 150% of the published length of the academic program or certificate

Schedule of Classes:

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

Second Degree:

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

Section:

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

Semester:

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

Senior:

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

Social Security Number (SSN):

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

Sophomore:

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

Student Code of Conduct (Student Handbook):

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

Student Concerns Process:

Visit <https://report.nmsu.edu/>.

Summer Session:

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

S/U Grade Mode (Satisfactory/Unsatisfactory):

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

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

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

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

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

Substitution:

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

Suspension:

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

Syllabus:

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

Synchronous Class (ONL):

A class that is taught fully online, with a requirement for attendance at a specific day/time.

T

TBD:

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

Term:

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

Teaching Credential:

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

TOEFL (Test Of English as a Foreign Language):

An English exam for foreign students used for admission purposes and for placement in college English classes.

Traditional Grading:

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

Transcript:

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

Transfer Courses (Transfer Credits):

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

Tuition:

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

U

Upper Division Courses:

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

Undergraduate:

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

Unofficial Transcript (Advising Document):

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

W

Wait List:

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

Warning:

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

Withdraw from a Course (Drop):

Officially withdrawing from a class/section through the online registration system, or in person with an academic advisor or at the Student Records Office. Classes may be dropped/cancelled according to the registration

deadlines posted at <https://records.nmsu.edu/students/important-dates.html>.

Withdraw from the University:

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

Work Study:

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

The NMSU System Academic Regulations

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

The regulations section is broken down into different areas:

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

Academic Programs of Study

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

Additional Degree Designations

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

Catalog Effective Period

The annual catalog edition is effective Summer Session I through Spring Semester and is considered active for an eight-year period for

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

Application for Degree/Graduation or Certificate

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

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

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

Multiple Degrees and Designations

A student may earn more than one degree or multiple degree designations by completing all of the requirements in an appropriate catalog for each degree or designation. Students meeting requirements for more than one degree must apply for and pay the application fee for each degree to be awarded. Upon completion of all requirements, multiple majors for a single degree (e.g., B.A., Major in Art; Major in Anthropology) and multiple bachelor's degrees (e.g., B.A. and B.S.) will be noted on the student's academic record/transcript and may also be granted at one commencement.

Degree Revocation

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

Honorary Degrees

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

Community College Certificate

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

Certificate of Achievement

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

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

Certificate of Completion

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

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

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

Associate's Degree

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

toward a four-year degree. Associate degree-seeking students who are interested in a dual degree should consult with their academic advisor. The Associate of Arts and the Associate of Science degrees cannot be earned together. The Associate of General Studies degree may not be earned with other associate degrees.

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

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

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

Associate Major

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

Baccalaureate Degree (Bachelor's Degree)

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

1. **Minimum Credit Hours:** a minimum of 120 credits (excluding "N" suffix courses)
2. **GPA requirement-** a minimum cumulative GPA of 2.0 in all courses taken at NMSU
3. **New Mexico General Education-** 32-35 credits of state-mandated general education courses (as specified in the General Education section); such courses are designed with a "G"
4. **New Mexico State University's Viewing a Wider World-** 6 credits of Viewing a Wider World courses; such courses are designated with a "V", or alternatives as specified in the Viewing a Wider World section

5. **Upper Division Courses**- a minimum of 48 credits in courses numbered 300-499/3000-4999.
6. **Residency** – Of the last 36 credits earned toward award of the degree:
 - a. 30 credits must be completed at NMSU
 - b. 21 credits must be upper-division (300/3000 or above) and
 - c. 12 of the 21 upper-division credits must be within the student's major.
NOTE: colleges or departments may require that more than 12 upper-division credits be within the major and they may direct that a certain number of these credits be course specific.
7. **Major** – all requirements for at least one undergraduate major field of study, other than a supplemental major, as specified in the college and departmental sections of the catalog. As an undergraduate student seeking a baccalaureate degree you are expected to declare a major before earning 45 credit hours toward your degree. You should complete your general education requirements within your first 90 credit hours earned

Second Baccalaureate Degree (Bachelor's Degree)

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

Bachelor's Degree Designations

Undergraduate Major

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

Supplemental Major

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

Undergraduate Minor

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

Undergraduate Concentration

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

concentrations are specified in the college and department's designated sections of this catalog.

Distance Education Bachelor's Degree Completion Program

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

Graduating with Honors

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

Graduate Degrees

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

Graduate Degree Designations

Graduate Major

A graduate major may include courses from more than one department, but at minimum, it must consist of at least 30 graduate credits. Additional requirements may be imposed by the State of New Mexico and New Mexico State University as specified in this Catalog.

Graduate Minor

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

Graduate Concentrations

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

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

1. Request the concentration at the time they file their official program of study.
2. Identify the concentration on their official Application for Degree.

Graduate Certificates

A Graduate Certificate program requires 12-18 credits of course work that is interrelated and designed to develop a focused skill or area of expertise but does not culminate in the awarding of a degree. Courses that comprise a graduate certificate must be regular approved courses

offered by the University and must be numbered 450/4500 or above. A graduate certificate is indicated on the student's transcript.

Master's Degree

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

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

Admissions to the Master's Degree

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

Program of Study

In the absence of a degree audit at the completion of one year of enrollment, each new graduate student should prepare a complete program of study in consultation with the student's advisor for programs. Students should check with their Program Director prior to completing either, the Graduate School only needs to receive one or the other.

Application to Candidacy

The program of study will formally list the curriculum requirements for degree completion and is required for application to candidacy. The program of study must be approved by the advisor, department, and academic dean and submitted to the Graduate School. The Program of study may specify the Catalog at the time of graduation, as long as the catalog is considered active. Otherwise, the current Catalog will be listed.

An Application for Admission to Candidacy must be filed with the Graduate School. This must be done before the completion of 12 credits of graduate coursework. The student must have a minimum cumulative GPA of 3.0 at the time the application is submitted. The application may specify the Catalog at the time of graduation, as long as the catalog is considered active. Otherwise, the current Catalog will be listed.

The student's program of study must:

1. Meet the requirements of the chosen catalog, including the regulations of the Graduate School and of the major department.
2. Be signed by the student, the student's advisor, department head, minor faculty if applicable, and academic dean.
3. List each course prefix/number, short title, credit hours and grades if available.

If the program of study does not comply with the departmental requirements or the potential degree audit, the program of study must be approved by the Dean of the Graduate School. . The Program of Study is not required for master's programs if defined within the Star Degree Audit.

Credit Hour Requirement

A minimum of 30 credits is required for the master's degree. Most master's degrees require at least 15 credits in courses numbered 500/5000 or above. This includes thesis credits for any master's programs that include a thesis option. Master's programs involving a

thesis, must include, either a minimum of 4 credits or a maximum of 6 credits of thesis. Please see the "Thesis" section for more information.

At least 15 credits for the master's degree must be for work in courses within the student's department. Additional credits may be selected from other fields to fit into a logical and justifiable program. However, courses that are used to remove deficiencies or satisfy prerequisites cannot be counted as requirements for a master's degree.

Coursework Requirement

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

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

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

Thesis Option

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

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

Graduate Committee for Thesis Option

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

1. **Committee chair:**
 - a. Must be from the student's home department
 - b. Must be a graduate faculty member
2. **Committee member(s):**
 - a. May be from outside the student's home department
 - b. Student's with a declared minor- may have the representative from a related area or be appointed by the Dean of the Graduate School.
 - c. Must be a graduate faculty member
3. **Dean's Representative:**
 - a. Must be a representative from a related area or appointed by the Dean of the Graduate School
 - b. Must be a graduate faculty member

Finalizing the Master's Thesis

After successful completion of the final examination, electronic submission of the approved thesis must be submitted to ProQuest ETD, no later than the deadline posted to the Graduate School website. The form and style of the thesis must comply with the guidelines provided in preparing your manuscript for submission, located here (<https://gradschool.nmsu.edu/Current%20Students/thesis-and-dissertation.html>). The guidelines also contain detailed information on the thesis submission and approval process. The thesis is not complete until the Graduate School has accepted it electronically.

Professional Degree and Non-Thesis Final Examination

Each candidate will be given a final examination conducted by their graduate committee in accordance with the schedule provided by the Graduate School. The department is responsible for ensuring that the Report of Results for the Master's Professional or Non-Thesis Final Exam form is submitted to the Graduate School no later than ten working days after the exam.

The final examination format for the professional degrees and non-thesis option will be determined by the department, with the approval of the Dean of the Graduate School. If a department does not specify an examination format, the final examination will consist of an oral defense of the candidate's field of study.

At the time of the final examination, a graduate student must have a cumulative GPA of at least a 3.0 and must be enrolled for a minimum of one credit hour in the final semester; or if the student is writing a thesis, he or she must have completed all course work for the master's degree.

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

Any candidate who fails the final examination may either:

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

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

Time Limit

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

Master's Accelerated Program (MAP)

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

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

Graduate departments within the colleges may allow academically qualified undergraduate students to substitute a maximum of 12 graduate course credits for elective courses in an undergraduate degree program. Graduate programs can use up to 12 credits of NMSU coursework (450/4500 level or higher) that can logically be applied toward completing a master's program of study. A grade of B or higher in this coursework will be required.

Program Participation Requirements:

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

Interdisciplinary Master's Degree

Interdisciplinary studies, at New Mexico State University, are intended for individuals specializing in programs that require integrating more than one discipline to fully engage in the field of study. The programs provide a mechanism to address emerging scholarship, innovation, research, and allow graduate students to engage in emerging technologies that optimize their education outside the traditional disciplinary boundaries. An Interdisciplinary study takes advantage of traditional academic training within specific departments and also allows students to customize their own career preparation. In these programs, a coherent common core is expected to combine existing courses across disciplines to meet unique objectives.

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

Admission

Students interested in pursuing an Interdisciplinary Master's Degree (IMAS) degree must meet with the Graduate School for advisement. The advisement session will include information on completing the IMAS admission application:

1. Develop a proposal for interdisciplinary studies
2. Create the IMAS graduate committee
3. Once the student's graduate committee is designated, the committee can require additional materials such as a statement of interest, letters of recommendation, GRE or GMAT scores and a personal interview.
4. Complete the IMAS referral form and procure committee members IMAS program approval.
5. Procure academic department head IMAS referral form approval.

6. Submit IMAS referral form and proposal for interdisciplinary studies to Graduate School for admissions.

Degree(s) Awarded

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

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

1. The student must present a written description of the program concept consisting of the following, as well as, the designated degree being sought and a name of the interdisciplinary area:
 - a. The objective of the program of study should include, proposed areas of skill development and proposed courses in more than one graduate degree granting department at NMSU.
 - b. A justification for not using an existing degree program.
2. The student's program of study must include a minimum of 30 graduate-level credits and a maximum of 36 graduate-level credits. Students may take six credits in departments that do not grant a graduate degree, but the courses must be numbered 450/4500 or above and be pertinent to the program of study.
3. The majority of the departments involved in the student's program will be master's degree granting departments. The student is expected to take at least 15 credits in the primary area of study within one department. The department selected by the student will receive a copy of the student's application for admissions to the Graduate School. In addition, the student is required to select a minor area of study in another department that consists of at least 9 graduate credit hours.
4. The student will form a committee composed of members of the graduate faculty and select an advisor who will chair the committee. The chair must be from the primary department where the student has taken at least 15 credit hours listed in the proposal submitted. The other committee member must be from the department in which the student has selected a minor area of study from the approved list.
5. The student will be required to submit the Candidacy Form after they have satisfactorily completed 12 credits.
6. The program will meet all requirements of a master's degree, with the interpretation, that "major field" includes courses from two or more departments and in the designated interdisciplinary study area.
7. The program of study will include the completion of a research thesis or project. The work may be submitted in the form of a publishable manuscript, technical report, thesis or creative option.
8. The student may enroll on a part-time basis keeping in mind that coursework cannot be more than seven years old at the time of the final examination.
9. The student will be administered a final comprehensive exam that is consistent with the department selected for the primary area of study. For example, if a department requires a written exam, the student in the interdisciplinary masters will also be required to take a written exam.
10. The final oral comprehensive exam will consist of questions pertinent to the area of study and the defense of the research thesis or project. In both cases, an integrated approach to the areas of study chosen should be followed.
11. All other rules for graduate study at NMSU must be followed.

Thesis/Non-thesis Option

As with any graduate student, the student in interdisciplinary studies can select to follow a thesis or non-thesis option. Students enrolled in the

thesis option register for six thesis credits. Students not wishing to follow the thesis option will be required to complete a project report. The project must reflect the interdisciplinary nature of the program which the student is pursuing.

Comprehensive Exam

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

Second Master's Degree

A student who has earned one master's degree at NMSU may be allowed to count a maximum of six semester credits earned on the first degree toward a second master's degree, if those credits fit into a logical graduate program. The number of shared credits may be increased for joint degree programs.

Teacher Licensure

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

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

Specialist in Education

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

Residency and Credit Requirements

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

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

Program of Study

After the completion of one year of enrollment, each beginning graduate student should prepare a complete program of study with the student's advisor. The program of study can be tentative, should be kept in the student's file within the department, and is not considered an "Application for Admission to Candidacy."

Major Field

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

Candidacy

Following the successful completion of 12 credits the student is eligible for admission to candidacy. With the achievement of candidacy, a committee is appointed to work with the candidate on the remainder of the program. The committee consists of three members of the graduate faculty in the College of Education.

Internship

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

Oral Examination

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

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

Time Limit

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

Doctoral Degrees

The doctoral degree requires significant scholarly study beyond the master's program.

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

Professional Doctoral Degrees

Doctor of Economic Development (DED)

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

Doctor of Education (Ed.D)

The degree of Doctor of Education demonstrates proficiency in a program of graduate study in which the emphasis is in preparation for performance in professional education. This program is intended primarily for students pursuing careers in which teaching, administration

or school services are predominant rather than those in research. The Ed.D. Degree in curriculum and instruction is offered in the Department of Curriculum and Instruction; the degree in educational administration is offered in the Department of Educational Leadership and Administration.

The requirements for doctoral degrees in the two departments of the College of Education have the following distinguishing elements:

1. The qualifying examination consists of a written and an oral section, both of which are administered prior to admission to the program. Acceptance for doctoral admission is equivalent to the successful completion of the qualifying examination. Residency of at least two consecutive semesters cannot commence until the semester after the qualifying examination is successfully completed.
2. Comprehensive examinations usually are administered three times annually. The written examination tests the major and related areas of concentration and is administered after successful completion of the orals within two weeks' time. A student who fails any part of the comprehensive examination may present him or herself for re-examination of the failed part of the exam before moving on to the next part.
3. The major area of study must be within the College of Education

A minimum of nine credits constitutes the related area. The courses can be taken in any department of the university with the approval of the student's committee. The related area must be specifically planned with the major and minor departments in order for the doctoral fields to be mutually supportive. Any transfer credit or predoctoral course work to be included in the related field must have the approval of both the major and minor department at the outset. Specified course work in both research and statistics is required for this degree. Other requirements are described in the departmental sections of this catalog.

Doctor of Nursing Practice (DNP)

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

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

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

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

Doctor of Philosophy (Ph.D.)

The Doctor of Philosophy degree requires distinguished attainment in both scholarship and original research. The doctoral degree requires significant scholarly study beyond the master's that is tailored to the

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

Interdisciplinary Doctorate

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

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

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

memorandum. Formal acceptance into a doctoral program may be required in order to receive financial assistance.

10. The number of courses required for degree completion will vary depending on the student's program of study, please see the department for more specific requirements. However, Interdisciplinary doctorate degree students must meet the requirements for residency, registration, the comprehensive examination, the Final Examination, the dissertation and the declaration of approved minor.
11. The dissertation work shall include at least 18 credits of a 700/7000-level course.

Completing your Doctoral Degree Program

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

Declaration of Approved Minor

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

Qualifying Examination

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

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

1. For students who enter the Graduate School with little or no previous graduate experience but wish to proceed directly to the doctorate, the qualifying examination should be taken after 12 credits of graduate work
2. For students who enter with a master's degree or equivalent from another university, or another department, the qualifying examination should be taken before completing one semester of graduate work.
3. For students who earn their master's degree at New Mexico State University and will continue in the same department, the department may allow the master's final examination to serve as the doctoral qualifying examination or may require a separate examination.

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

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

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

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

doctorate program of study. The student must submit the program of study to the Graduate School immediately following admission into the doctoral program and before registering for additional coursework.

Doctoral Graduate Committee

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

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

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

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

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

Program of Study

Students should file the Program of Study Form once they have:

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

The Program of Study Form should be completed and submitted to the Graduate School before registering for any additional courses. The individualized program of study is designed to meet the campus residency requirement and includes a minimum of 30 graduate credits beyond the master's.

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

Comprehensive Examination

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

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

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

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

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

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

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

Time Limit for the Comprehensive Examination

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

Advancement to Candidacy

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

For advancement to candidacy the following criteria must be met

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

Upon receiving advancement to candidacy, students must establish residency and follow the Dissertation Registration Requirements (see Residency Requirements below).

Residency Requirements

The minimum campus residency requirements for the doctoral degree include enrollment in a minimum of 9 credit hours of program course work, including a minimum of 3 credit hours of dissertation, in at least two semesters of classes taught at NMSU. In some cases the minimum credit hour enrollment for the two semesters required to establish

residency may vary based on the instructional delivery of the program, and must have prior approval from the Dean of the Graduate School.

Dissertation Registration during Fall/Spring Sessions

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

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

Dissertation Registration during Summer Sessions

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

Dissertation Leave of Absence

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

Final Examination

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

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

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

Every student meeting the final examination qualifications must be enrolled in a minimum of 1 credit hour in order to defend. The final examination must be completed in accordance with the schedule provided in the academic calendar. Ten working days before the examination is taken the department must submit the form requesting this examination to the Graduate School. This form may be found by visiting the Graduate School website (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>) and departmental offices.

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

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

Finalizing the Doctoral Dissertation

After successful completion of the final examination, electronic submission of the approved dissertation must be submitted to ProQuest ETD, no later than the deadline posted to the Graduate School website. The format review of dissertation will be performed electronically by the Graduate School. The form and style of the dissertation must comply with the regulations given in Preparing your manuscript for submission located on the Graduate School's website (<https://gradschool.nmsu.edu/Current%20Students/thesis-and-dissertation.html>). The dissertation is not complete until the required forms are received at the Graduate School. Required forms may be found here (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>).

Registration

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

Admission Requirement

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

Class Schedule

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

Registration Schedule by Classification

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

University Credits

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

Course Load for Undergraduate Students

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

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

Course Load for Graduate Students

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

Course Numbering

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

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

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

Class Delivery

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

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

Prerequisites and Corequisites

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

Registration Changes

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

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

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

1. **Last day to add a class without instructor's signature** - during this period courses may be added online through myNMSU, or through your academic advisor (if necessary).
2. **Last day to add a class with instructor's signature** - during this period courses may only be added with either the "Change of Schedule (https://records.nmsu.edu/_files/sro-forms/Change%20of%20Schedule%20Form.pdf)" form signed by the instructor (available

online on the University Student Records Office website (<https://records.nmsu.edu>)).

Or students taking classes online and who do not live in the Las Cruces Area must email the instructor, using the NMSU email, in order to get permission to be added to the course. If the instructor approves the addition, the approved response must be sent to either the student's academic advisor or to record_grade@nmsu.edu with the student's name, ID number and course CRN number they are wanting to add.

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

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

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

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

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

Waitlisting

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

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

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

Students cannot be added to the waitlist after the first day of classes. Instructor overrides can only be made after the second day of class, at

which point the instructor's signature is required on either the "Change of Schedule (https://records.nmsu.edu/_files/sro-forms/Change%20of%20Schedule%20Form.pdf)" form to add a course.

Graduate Registration Requirements for Summer

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

Repeating Courses for A Change in Grade

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

Substitutions and Waivers

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

Auditing a Course (No Credit)

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

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

Academic Performance and Progress Attendance and Student Performance

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

Absences from Class and Failure to Complete Assignments

Students who must miss class due to accident or illness or other circumstances beyond their control should consult the course syllabus and the instructor for guidance. Students may be administratively withdrawn from a course due to excessive absences (consecutive absences in excess of the number of class meetings held within a week or any number of absences, including failing to use the online Learning

Management System, which are impairing the student's performance), or for persistent failure to complete assignments. In such cases, the Instructor may recommend administrative withdrawal by providing a completed "Student Absence/Lack of Progress Report" form to the Academic Associate Dean. If the Academic Associate Dean agrees with the recommendation of the course instructor, the student will be administratively withdrawn from the course. To appeal the decision see the Administrative Withdrawal (p. 48) section.

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

Classroom Conduct

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

Student Performance Assessment

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

Academic Program Assessment

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

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

only in aggregate form. Learn more about NMSU's Academic Program Assessment at <https://assessment.nmsu.edu/>

Exam Week and Final Examinations

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

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

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

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

Developmental Evaluation

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

Basic Academic Skills

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

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

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

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

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

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

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

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

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

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

Independent Study and Directed Reading Courses

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

Adjusted Credit Option

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

1. All of the student's academic history pre-dating the request, including all NMSU course credits previously attempted or completed, transfer coursework, CLEP, ACT, advanced placement, special examination, and/or military service are included in the adjustment and designated as "ADJUSTED CREDITS" on the transcript. These credits are no longer included in the cumulative grade point average calculation.
2. Courses carrying an academic grade of S, CR, C- or better, earned prior to the grading period in which the student requested this option, are treated as earned academic credit and need not be repeated, except where a higher grade is required in the student's academic program.
3. Courses carrying an academic grade of U, CD, D or F, earned prior to the grading period in which the student requested this option, remain on the student's transcript, but no academic credit is provided for these courses. The student must repeat these courses to obtain academic credit.
4. The student's academic transcripts will continue to reflect all coursework, including courses falling under the adjusted credit option. In no circumstances will a transcript be issued that does not include all courses attempted at this university.
5. The student's current academic status, eligibility for employment, and financial aid may be impacted. Probationary status and eligibility for on-campus employment are not affected by the exercise of the adjusted credit option.
6. The repeat rule for courses starts anew.
7. The student will not be eligible for the award of an associate degree until earning thirty (30) or more additional credits after exercise of the Option.
8. The student is eligible for University honors at graduation upon completing a minimum of 60 academic credits at NMSU, after the

adjusted credit option is exercised, with a resulting grade point average that satisfies University regulations for honors.

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

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

Credit by College Level Examination Program (CLEP)

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

Credit by Examination

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

Credit for Military Service

New Mexico State University will award academic credit to United States military personnel for courses and Military Occupational Specialties (MOS), based on the American Council of Education Guide (ACE) as well as through national standardized tests, such as CLEP, AP, PEP and DANTES. Credit for military training is in accordance with NMSU Faculty Senate Legislation Proposition 24-07/08, which was passed in May 2008. Military Training and Military Occupational Specialties (MOS) must have

a recommendation evaluation by ACE (in the ACE Guide) for credit to be awarded. Courses accepted for transfer credit become part of the student's official NMSU transcript and academic record. If a student wishes to appeal a decision regarding the acceptance of military training/education and/or MOS for academic credit, the student must submit a written statement of appeal to the Dean of the College to which the student has applied. The Dean will review the merits of the appeal and render a decision. The decision of the Dean is final.

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

NOTE: Students submitting military transcripts for credit evaluation must keep in mind the Maximum Time Frame policy. See Financial Aid (p. 69) Section.

Graduate Course Deficiencies

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

Short Courses for Graduate Students

Short course(s) that are numbered 450/4500 and above have been approved to carry graduate credit. Graduate students must be registered for the short course(s) to receive graduate credit. Concurrent enrollment of graduate students in regular and short courses for the fall/spring semesters is allowed, provided the combined total credits does not exceed 15. All short courses carrying one-semester credit will be graded on a S/U basis, and these credits will be counted toward the student's limit of S/U credits.

Challenging Graduate Courses

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

Grading University Grading System

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

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

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

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

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

Midterm and Six-Week Early Performance Grades

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

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

Retention of Grading Records

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

Minimum Grade Requirement for Undergraduate Students

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

Minimum Grade Requirement for Graduate Students

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

Courses in which a student earns a D or F grade do not ever satisfy graduate degree requirements; however, these grades will be calculated in determining the students' cumulative grade-point average. To obtain academic credit, students must retake courses in which a grade of D or F was earned.

S/U Grading

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

Designated S/U Courses

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

Election of the S/U Grading Option - Undergraduate Students

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

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

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

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

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

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

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

I Grade Designation

The letter grade of I (incomplete) is given for passable work that could not be completed due to circumstances beyond the student's control

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

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

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

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

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

RR Grade

The RR grade may be assigned only in undergraduate developmental courses (CCDE, CCDL, CCDD & CCDD) and indicates that the student has made substantial progress toward completing the requirements of the course. It carries neither penalty nor credit, so a student must re-enroll and successfully complete the course in order to earn credit. The grade

of RR may be received only once in any given course, and is a permanent notation on the student's transcript.

W Grade Designation

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

Effect of Change of Grade

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

Repeating Courses for a Change in Grade

Undergraduate students: may repeat courses, for a change in grade, when the original grade earned was a D or F. Las Cruces Main Campus students are not allowed to count repeated courses towards the minimum 15 credits required to retain merit-based institutional scholarship. Once a grade of C- or better is earned, the course will then be substituted in the calculation of the grade-point-average and students will no longer be able to repeat that course for change of grade purposes. Student transcripts will continue to show the grade awarded for each course attempt. If the student's original grade was a D and he/she repeats the course, but receives a F, the second grade will not be substituted for the original.

Graduate students: may repeat courses to achieve a higher grade, but the grade assigned for each attempt will remain on the transcript and will be counted in the grade point average calculation.

Grade Point Average

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

Grading in Graduate Research

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

PR indicates that the student has devoted an adequate amount of time to the work scheduled but does not indicate the quality. U indicates that the student has stopped work or is doing work of unacceptable quality.

At the conclusion of the final oral examination, or when the thesis/dissertation is submitted for the final signature of the graduate dean, the instructor will report the final S or U grade for that semester. If the thesis/dissertation and the performance in the final oral examination are found to be acceptable, the instructor will report an S (satisfactory) grade. If the thesis/dissertation or the performance in the final oral examination is found to be unacceptable, the instructor will report an U (unsatisfactory) grade.

If a student accumulates a total of two U (unsatisfactory) grades in courses numbered either 599/5999, 600/6991, 700/7000, or any other graduate level project/research type courses with S/U grading, the student will be placed on provisional status. If three U (unsatisfactory) grades are reported for these courses, the student will be dismissed from the Graduate School.

Withdrawals

For more information regarding how withdrawals impact tuition refunds, please see the Tuition, Fees & Other Expenses (p. 68) section of the catalog.

Withdrawal from a Single Course

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

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

Leave of Absence from the Graduate School

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

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

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

Administrative Withdrawals

If a student has stopped attending class without formally withdrawing, stopped using the online Learning Management System, or has a history of persistent unexcused absences or failures to complete assignments, the University reserves the right to remove the student from the class by means of an administrative withdrawal. An administrative withdrawal may be requested under the following circumstances, excluding absences excluded through University policy:

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

In NO case is an administrative withdrawal used to avoid the assigning of D, F, U or RR grades for marginal or failing work. Administrative

withdrawals are subject to the same refund rules as student initiated withdrawals (100% refund prior to census and no refund after census)/

To request consideration for an administrative withdrawal, the instructor must complete the Student Absence/Lack of Progress Report (https://records.nmsu.edu/_files/sro-forms/Student%20Absence%20or%20Lack%20of%20Progress%20Report%20-%20Administrative%20Withdrawal.pdf), found on the forms page of the University Student Records Office webpage, and route for approvals. The University Student Records Office is ultimately responsible for processing the administrative withdrawal.

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

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

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

Military Withdrawal

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

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

1. **Military and Veterans Programs (MVP):** TA/VA students ordered to Active Duty must provide a copy of orders to the MVP office, in Corbett Center Student Union, Room 244, or by email mvp@nmsu.edu. To assist in reporting accurate information to their military service or the VA Regional Office, the student should also provide, in writing, the last day of class attendance.
2. **NMSU University Student Records:** All students presenting their orders to the University Student Records Office, (575) 646-3411, or records@nmsu.edu, will receive a military withdrawal from classes and full tuition and fees refund for that semester.

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

Student Medical Withdrawal

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

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

Medical Conditions of a Family Member Withdrawal

A student who is withdrawing because of a medical condition of an immediate family member must submit a letter from the family member's attending physician. This action applies to all courses a student is registered for in the affected semester(s). The student cannot select which courses they want to withdraw from and which they want to remain registered for when exercising this option. It must be on official letterhead with an original signature, stating the date(s) within the semester that the student's immediate family member was under medical care and that the student must withdraw to attend to the immediate family member's medical condition. This letter must be submitted within the semester or no later than one academic year at the end of the term for which the withdrawal is being requested.

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

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

Withdrawal from NMSU

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

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

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

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

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

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

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

Graduation and Commencement

Graduation Requirements

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

Applying for a Degree

Any students that are in their final semester of classes are considered degree candidates and are required to submit an "Application for Degree" as well as pay graduation fees for each degree being sought. The application for Degree form is available online through the myNMSU website. It must be completed and submitted by the designated deadline for that semester. The fees for the Las Cruces campus are all listed in the Tuition, Fees and other Expenses (p. 67) section of the catalog. Once a student submits the application, the fee will be included in the total cost for the semester or session in which the candidate anticipates completing their degree requirements.

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

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

Attendance at the Commencement Ceremony

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

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

1. Receive permission from the Academic Dean of their college
2. Show a minimum cumulative grade-point average of 2.0
3. Only need 12 or fewer credit hours to complete their degree requirements
4. These remaining credit hours are being offered in the upcoming summer schedule of classes
5. Submit a degree application and approved petition form (available in the Dean's office of the student's primary major) by the late application deadline to apply for a degree in the spring semester.

Academic Regalia

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

Diploma

All fees and bills owed the university must be paid in full before a student may receive a diploma or official transcripts. The degree title and major(s) will be printed on the diplomas, in accordance to the degree application award, determined by the academic colleges. Academic honors will also be printed on the diplomas below the degree and major(s). The name on

the diploma will reflect the student's current official NMSU records. Name changes are only processed for currently admitted students.

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

Academic Standing, Probation and Suspension

Undergraduate Academic Standing

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

Undergraduate Academic Warning

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

While under Academic Warning the following restrictions may apply:

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

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

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

Undergraduate Academic Probation I

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

Under Academic Probation I the following conditions apply:

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

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

Undergraduate Academic Probation II

Academic Probation II is issued in two ways.

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

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

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

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

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

Continuing in Probationary Status

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

Removal of Academic Probation

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

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

Academic Suspension

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

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

Summer Attendance Impact on Academic Standing

A student may use summer classes to get a warning or probationary status removed. Students suspended at the close of the spring semester may have their Academic Suspension rescinded if they attend a summer session at NMSU or one of its Community College campuses. Such

attendance must raise the combined spring semester and summer GPA to 2.0 or better. Under no circumstances may a student on Academic Warning or Academic Probation be allowed to register for an overload. The current academic status is continued if the student withdraws from the university and the probation or suspension status applies to all subsequent enrollments until the cumulative GPA is 2.0 or higher.

Graduate Academic Probation and Suspension

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

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

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

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

Students on Graduate Academic Suspension are barred from enrolling in graduate-level courses at NMSU while on suspension. Graduate students on Graduate Academic Suspension must sit out a minimum of one semester. Graduate students on suspension who wish to continue Graduate School after suspension must re-apply to the department and Graduate School. The student must also petition College Academic Dean or the Graduate School Dean, based on the major and degree the student is pursuing to be removed from Graduate Academic Suspension. At this time the graduate academic suspension status will be evaluated for possible readmission to the department. Should the suspension be lifted, the graduate student is placed on Graduate Academic Probation II or Graduate Re-admit on Probation II until such time that the graduate cumulative GPA equals or exceeds 3.0.

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

Academic Misconduct and Grievances Student Academic Code of Conduct

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

While it is essential to refer to the detailed governing rules in the ARP, the process is summarized as follows: An institution-wide Academic Conduct Officer is responsible for processing each case of alleged academic misconduct. The accused student is provided notice of the

allegation and has the right to participate during the fact-finding process. The student may contest the investigative findings or sanction in a formal review before a university Hearing Panel. Either party to the matter has the right to a final appeal of the results or a Level II sanction to the Office of the Provost.

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

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

Policies

- ARP 5-10 (<https://arp.nmsu.edu/5-10/>)
- ARP 5-11 (<https://arp.nmsu.edu/5-11/>)

Examples of Academic Misconduct and Report Form

- ARP Appendix 5.10-A (Examples) (<https://arp.nmsu.edu/wp-content/uploads/sites/26/2018/01/Appendix-5-10-A.pdf>)
- ARP Appendix 5.11-B (Form) (<https://arp.nmsu.edu/wp-content/uploads/sites/26/2018/01/Appendix-5-11-B.pdf>)

Flowchart of Procedures

- ARP Appendix 5.11-A (<https://arp.nmsu.edu/wp-content/uploads/sites/26/2018/01/Appendix-5-11-A.pdf>)

University Student Records Office Privacy Rights

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

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

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

Social Security Numbers in Student Records

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

university in accordance with the Family Educational Rights and Privacy Act.

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

Change in Demographic Information

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

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

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

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

Changes in Residency Status for Tuition Purposes

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

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

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

residency.html website or the University Student Records Office on the Las Cruces campus.

Official Transcripts

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

Transcripts can either be ordered in person at the University Student Records Office or online at <https://records.nmsu.edu/forms/transcripts.html>, there will be a fee for these that may vary depending on the total number of transcripts ordered and the type of delivery method that is selected. A student can request two types of transcripts an electronic one, which is sent as a secured PDF or a printed hard copy that can be delivered in a sealed envelope.

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

Purging of Student Files

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

Areas of Interest

What Are Meta-Majors?

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

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

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

- Applied and Clinical Health Sciences
- Applied Social and Behavioral Sciences
- Business
- Communication, Media Study, and Creative Arts
- Humanities and Social Sciences

- Life Sciences
- Physical Sciences and Engineering
- Teacher Education

Applied and Clinical Health Sciences

- Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences (p. 364)
- Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences (p. 366)
- Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology (p. 1151)
- Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology (p. 1153)
- Nursing - Bachelor of Science in Nursing (p. 1191)

Applied Social and Behavioral Sciences

- Anthropology - Bachelor of Arts (p. 450)
- Communication Studies - Bachelor of Arts (p. 539)
- Computer Science - Bachelor of Arts (p. 561)
- Counseling and Community Psychology - Bachelor of Science (p. 1113)
- Geography (Geographic Information Science Tech) - Bachelor of Science (p. 650)
- Geography (Human/Environment Relationships) - Bachelor of Science (p. 652)
- Human Development Family Science - Bachelor of Science (p. 362)
- Social Work - Bachelor of Social Work (p. 1308)
- Sociology - Bachelor of Arts (p. 1317)

Business

- Accounting - Bachelor of Accountancy (p. 851)
- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 297)
- Computer Science - Bachelor of Arts (p. 561)
- Economics (Energy Economics) - Bachelor of Business Administration (p. 871)
- Economics - Bachelor of Business Administration (p. 869)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 355)
- Finance (Banking and Financial Planning) - Bachelor of Business Administration (p. 882)
- Finance (Entrepreneurial Finance) - Bachelor of Business Administration (p. 883)
- Finance (Financial Analyst) - Bachelor of Business Administration (p. 885)
- Finance (Risk Management and Insurance) - Bachelor of Business Administration (p. 886)
- Finance - Bachelor of Business Administration (p. 881)
- General Business (Entrepreneurship) - Bachelor of Business Administration (p. 894)
- General Business - Bachelor of Business Administration (p. 892)

- Hotel, Restaurant and Tourism Management - Bachelor of Science (p. 419)
- Information Systems - Bachelor of Business Administration (p. 853)
- International Business - Bachelor of Business Administration (p. 873)
- Management (Human Resource Management) - Bachelor of Business Administration (p. 896)
- Management (Project Supply Chain Management) - Bachelor of Business Administration (p. 898)
- Management (Small Business Management Entrepreneurship) - Bachelor of Business Administration (p. 900)
- Marketing (Advertising) - Bachelor of Business Administration (p. 910)
- Marketing (PGA Golf Management) - Bachelor of Business Administration (p. 911)
- Marketing (Professional Selling) - Bachelor of Business Administration (p. 913)
- Marketing (Strategic Marketing) - Bachelor of Business Administration (p. 915)
- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 300)

Communication, Media Study, and Creative Arts

- Animation and Visual Effects - Bachelor of Creative Media (p. 596)
- Art (Art History) - Bachelor of Arts (p. 474)
- Art (Museum Conservation) - Bachelor of Fine Arts (p. 477)
- Art (Studio Art) - Bachelor of Arts (p. 476)
- Art (Studio Art) - Bachelor of Fine Arts (p. 479)
- Communication Studies - Bachelor of Arts (p. 539)
- Dance (Contemporary Dance) - Bachelor of Arts in Dance (p. 1148)
- Digital Film Making - Bachelor of Creative Media (p. 599)
- English (Creative Writing) - Bachelor of Arts (p. 633)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 637)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 639)
- English - Bachelor of Arts (p. 635)
- Journalism and Media Studies - Bachelor of Arts (p. 704)
- Music (Instrumental Performance) - Bachelor of Music (p. 790)
- Music (Piano Performance) - Bachelor of Music (p. 791)
- Music (Pre-Music Therapy) - Bachelor of Arts (p. 784)
- Music (Pre-Speech Language Pathology) - Bachelor of Arts (p. 786)
- Music (Theatre) - Bachelor of Arts (p. 788)
- Music (Vocal Performance) - Bachelor of Music (p. 793)
- Music - Bachelor of Arts (p. 783)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 795)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 797)
- Theatre Arts (Musical Theatre) - Bachelor of Arts (p. 840)
- Theatre Arts - Bachelor of Arts (p. 838)

Humanities and Social Sciences

- Anthropology - Bachelor of Arts (p. 450)
- Communication Studies - Bachelor of Arts (p. 539)
- Criminal Justice - Bachelor of Criminal Justice (p. 608)
- Economics - Bachelor of Arts (p. 615)
- Economics - Bachelor of Arts in Economics (p. 867)
- English (Creative Writing) - Bachelor of Arts (p. 633)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 637)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 639)
- English - Bachelor of Arts (p. 635)
- Foreign Languages (French) - Bachelor of Arts (p. 733)
- Foreign Languages (German) - Bachelor of Arts (p. 736)
- Foreign Languages (Spanish) - Bachelor of Arts (p. 738)
- Geography (Geographic Information Science Tech) - Bachelor of Science (p. 650)
- Geography (Human/Environment Relationships) - Bachelor of Science (p. 652)
- Government - Bachelor of Arts (p. 678)
- History - Bachelor of Arts (p. 696)
- Justice, Political Philosophy, and Law - Bachelor of Arts (p. 802)
- Linguistics - Bachelor of Arts (p. 741)
- Philosophy - Bachelor of Arts (p. 804)
- Psychology - Bachelor of Arts (p. 830)

Life Sciences

- Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture (p. 323)
- Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 325)
- Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 326)
- Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 327)
- Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture (p. 329)
- Agricultural and Extension Education (Agricultural Extension/Community Development) - Bachelor of Science in Agriculture (p. 287)
- Agronomy - Bachelor of Science in Agriculture (p. 393)
- Animal Science (Animal Industry) - Bachelor of Science in Agriculture (p. 312)
- Animal Science (Science) - Bachelor of Science in Agriculture (p. 314)
- Biology - Bachelor of Arts (p. 501)
- Biology - Bachelor of Science (p. 503)
- Computer Science - Bachelor of Arts (p. 561)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 505)
- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 374)
- Environmental Science - Bachelor of Science in Environmental Science (p. 395)

- Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 376)
- Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 379)
- Food Science and Technology (Culinary Science) - Bachelor of Science in Food Science and Technology (p. 357)
- Food Science and Technology (Meat Science) - Bachelor of Science in Food Science and Technology (p. 358)
- Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology (p. 360)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 397)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 507)
- Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture (p. 401)
- Horticulture - Bachelor of Science in Agriculture (p. 399)
- Microbiology - Bachelor of Science (p. 509)
- Range Science - Bachelor of Science in Agriculture (p. 316)
- Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture (p. 404)
- Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture (p. 406)
- Soil Science (Soils) - Bachelor of Science in Agriculture (p. 408)

Physical Sciences and Engineering

- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 1071)
- Biochemistry - Bachelor of Science (p. 524)
- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 934)
- Chemistry - Bachelor of Arts (p. 526)
- Chemistry - Bachelor of Science (p. 529)
- Civil Engineering - Bachelor of Science in Civil Engineering (p. 946)
- Computer Science (Algorithm Theory) - Bachelor of Science (p. 566)
- Computer Science (Artificial Intelligence) - Bachelor of Science (p. 568)
- Computer Science (Big Data and Data Science) - Bachelor of Science (p. 571)
- Computer Science (Computer Networking) - Bachelor of Science (p. 573)
- Computer Science (Cybersecurity) - Bachelor of Science (p. 576)
- Computer Science (Human Computer Interaction) - Bachelor of Science (p. 578)
- Computer Science (Software Development) - Bachelor of Science (p. 581)
- Computer Science - Bachelor of Science (p. 563)
- Cybersecurity - Bachelor of Science (p. 583)
- Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering (p. 969)
- Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering (p. 971)

- Electrical Engineering (Control Power) - Bachelor of Science in Electrical Engineering (p. 973)
- Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering (p. 977)
- Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering (p. 979)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 966)
- Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics (p. 994)
- Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics (p. 995)
- Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics (p. 997)
- Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics (p. 999)
- Engineering Technology - Civil (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology (p. 1027)
- Engineering Technology - Civil (Transportation Technology) - Bachelor of Science in Engineering Technology (p. 1029)
- Engineering Technology - Civil - Bachelor of Science in Engineering Technology (p. 1025)
- Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology (p. 1031)
- Engineering Technology - Information - Bachelor of Science in Engineering Technology (p. 1033)
- Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology (p. 1035)
- Geology (Earth Science Education) - Bachelor of Science (p. 663)
- Geology (Earth and Environmental Sciences) - Bachelor of Science (p. 660)
- Geology (Geological Sciences) - Bachelor of Science (p. 666)
- Geomatics - Bachelor of Science in Geomatics (p. 1037)
- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 1059)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (p. 1043)
- Information and Communication Technology (Network Technologies) - Bachelor of Information Communication Technology (p. 1046)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (p. 1049)
- Information and Communication Technology - Bachelor of Information and Communication Technology (p. 1039)
- Mathematics (Actuarial Science and Insurance) - Bachelor of Science (p. 760)
- Mathematics (Probability and Statistics) - Bachelor of Science (p. 763)
- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 1073)
- Physics - Bachelor of Arts (p. 820)
- Physics - Bachelor of Science (p. 822)

Teacher Education

- Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture (p. 285)

- Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture (p. 286)
- Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies (p. 1266)
- Early Childhood Education - Bachelor of Science in Education (p. 1269)
- Educational Leadership - Bachelor of Science (p. 1271)
- Elementary Education (Math K-8) - Bachelor of Science in Education (p. 1274)
- Elementary Education (Science K-8) - Bachelor of Science in Education (p. 1276)
- Elementary Education (Social Studies K-8) - Bachelor of Science in Education (p. 1277)
- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 353)
- Kinesiology (Physical Education) - Bachelor of Science in Kinesiology (p. 1155)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 795)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 797)
- Secondary Education (Secondary Education General Science) - Bachelor of Science in Education (p. 1278)
- Secondary Education (Secondary Education Language Arts) - Bachelor of Science in Education (p. 1281)
- Secondary Education (Secondary Education Math) - Bachelor of Science in Education (p. 1283)
- Secondary Education (Secondary Education Social Studies) - Bachelor of Science in Education (p. 1286)
- Special Education (Elementary Education) - Bachelor of Science in Education (p. 1288)
- Special Education (Secondary Education) - Bachelor of Science in Education (p. 1290)

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

All applicants with tentative admission must submit a final, official high school transcript showing a graduate date before a final admission decision is granted. If the student also attended a non-NMSU system post-secondary institution during high school, official transcripts from each institution will also be needed. If the high school attended was outside of the United States, a professional foreign credential evaluation from a NACES company will also be required.

Freshman Admission Requirements

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

- Cumulative high school GPA of 2.75, or
- ACT composite score of 21 or SAT score of 1060, or
- Ranked in the top 20 percent of their high school graduating class or
- A GED cumulative score of 480 or HiSET cumulative score of 45

Applicants who meet at least one of the above criteria will be admitted to NMSU. An applicant who does not meet admission requirements may be admitted if a review of additional academic information indicates that the student would be successful at NMSU. When reviewing the admissibility of students, Undergraduate Admission and Orientation considers many factors, including high school GPA, test scores, dual-credit coursework, leadership experience, community involvement, and other accomplishments. Applicants may be asked for additional information, including a personal statement, to support their application.

Note for students about scholarships: Although home school students only need to submit a high school transcript for admission to NMSU, a New Mexico GED or HiSET may be required to be eligible for state-funded scholarships. Similarly, the ACT or SAT scores may be needed for out-of-state students for competitive scholarships.

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

Aggie Pathway

In the Aggie Pathway program, the NMSU system works together to assist students who do not meet the admission requirements to the university or who choose to start at one of the system's community colleges. Aggie Pathway students begin at one of NMSU's community college campuses. They may transition to the university campus upon meeting the following requirements:

- Successful completion of 24 credits, in addition to any required developmental courses
- 2.0 cumulative college GPA

All students participating in the Aggie Pathway program can attend academic, cultural and athletic events on the NMSU Las Cruces campus. Students enrolling through NMSU Doña Ana Community College campus also have access to on-campus housing and dining.

Undergraduate Admissions and Orientation

Contact Information

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

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

- A degree-seeking student or
- A nondegree student under the policies and conditions as set forth in this section.

Degree-Seeking Students

How to Apply as a First-Time Student (Regular Student)

Requirements for admission as a degree-seeking student:

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

Aggie Welcome and Orientation

Orientation for all new first-time and transfer students is mandatory. At NMSU's Aggie Welcome and Orientation (AWO) programs, students will attend information sessions, learn about campus resources and college life, meet with an academic advisor, and register for classes.

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

More information about Aggie Welcome and Orientation is available at <https://awo.nmsu.edu/>.

Nondegree- Seeking Students

How to Apply as a Nondegree Seeking Student

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

Non-degree students are ineligible to:

- Receive financial aid or student employment
- Participate in student government or intercollegiate athletics
- Receive benefits from any veterans' program

Transcripts from the last post-secondary institution or high school may be required to assure readiness for university-level courses. A \$25 one-time, nonrefundable application fee is required.

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

Changing from Nondegree Status

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

How to Apply For Readmission

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

A student who has attended other post-secondary institutions during an absence must have official transcripts from those other post-secondary institutions sent directly to Undergraduate Admissions and Orientation. They must be eligible to return to the institution they last attended.

Transcripts must be received before the date of registration. Academic standing at the time of readmission will generally be determined by previous NMSU academic standing. However, academic performance at other institutions attended during the applicant's absence from NMSU may be considered when determining the student's admission status.

Opportunities for High Schools Students

Dual Credit for High School Students

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

Eligibility Requirements

- High school junior or senior
- High school grade point average (GPA) of 3.0 or higher
- ACT composite of 21 or SAT score of 1060
- For those students who have not had the opportunity to take the ACT or SAT, a PSAT score of 860 or above will be required
- Approval from a high school counselor
- Approval from a parent or guardian
- Meet with an NMSU Dual Credit Academic Advisor
- Completion of all required documentation:
 - Application for Admission
 - State Dual Credit Request Form
 - Student Acknowledgement and Parent Certification Form
 - High School Transcript and Test Scores

Out-of-State Students and Legal Jurisdiction

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

Applying for Admission

Application Materials

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

Application Deadlines

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

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

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

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

Transfer Students

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

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

Community/Junior College Transfers

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

NOTE: Students currently enrolled at an NMSU Community College (Alamogordo, Dona Ana or Grants) are not considered transfer students. If a student wants to change campuses they must submit a Change of Campus (<https://admissions.nmsu.edu/change-of-campus-request/>) form.

Transfer Students- Admission Requirements

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

4. Students with fewer than 24 completed college credit hours must fulfill the transfer and first-year admission requirements.
5. Students must be eligible to return to their last college or university.
6. Any student who conceals the fact that they attended another college or university and has not submitted a transcript for each institution, whether or not credit was earned, will be subject to immediate suspension.
7. NMSU will uphold academic and judicial suspensions from other colleges and universities.
8. * The types of credits listed below are not counted toward the 24 completed credit hour requirement:
 9. Courses taken for college credit while in high school
 10. Credits by examination (i.e. CLEP, IB, AP, etc.)
 11. Credits from a non-regionally accredited institution
 12. Credits from institutions that do not provide grades
 13. Credits from experience such as a Joint Services Transcript

Transfer of International Credit

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

General Requirements for Transfer Credits

Credit will be awarded for transfer courses as follows:

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

Student Responsibility

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

NMSU maintains a database (<http://nmsudirect.nmsu.edu/>) of commonly transferred courses from numerous institutions. Courses included in the database at the time the student is admitted to NMSU will automatically transfer to NMSU, provided the student follows all guidelines (see Currently Enrolled NMSU Students below). If a transferred course does not exist in the database, it is the student's responsibility to provide the departmental faculty with sufficient materials (e.g. catalog

description, syllabi, etc.) to determine if any of the department's courses may be equivalent to the credits being transferred.

Currently Enrolled NMSU Students

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

Religious Center Courses in Religion

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

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

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

Graduate Transfer Credits

For more information about transferring graduate credits please visit the Graduate School (p. 74) section of this catalog.

Evaluation of Transfer Credits

NMSU has 3 levels of course credit transfer. Once a student has been admitted to NMSU, they are awarded credit for equivalent courses accordingly. Following award of credit as described in Levels 1 and 2 (below), application of any additional credit transfer via specific Program Articulation agreements will be approved by the student's academic department and dean, including additional courses in the major that may count toward a degree or a minor but, are not included in a Program Articulation.

Level 1

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

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

Level 2

Faculty established NMSU course-to-course equivalency transfer

1. Equivalency is determined by the designated departmental faculty in the department/program in which the equivalent course is offered, and may include a review of course description, syllabus and/or interaction with the other institution. If a course equivalency does not exist in the database, it is the student's responsibility to provide departmental faculty with sufficient materials to determine if any

of the department's courses may be equivalent to the credits being transferred.

2. Credit for courses transcribed with NMSU equivalency may/will count toward the degree/major.
3. Credit for courses with no NMSU equivalence will be transcribed as 100E (lower level) or 300E (upper level) and may or may not count as credit toward a specific degree. Departmental faculty may accept the "E" course as elective credit toward the degree, or as a substitute for a course not applied universally.

Level 3

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

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

National Student Exchange (NSE)

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

Transfer Credit Appeal Process

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

Military and Veterans Programs (MVP)

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

- In-state tuition rates for active-duty military and their dependents stationed at regional military installations (including Ft. Bliss); or those eligible for U.S. Department of Defense (DoD) Tuition Assistance (TA) or U.S. Department of Veterans Affairs (VA) education benefits
- Easily transferable military credits that count toward degrees at NMSU
- Facilitation of MyCAA military spouse benefits and DoD TA
- Advocacy from admission to graduation
- Student Veteran Housing for student veterans and their families
- Priority registration for military and veteran students

- Aggie Green Zone Training, educating faculty and staff about our military and veteran students and the unique value they bring to campus
- SALUTE National Honor Society for student veterans
- Connection with the Student Veterans Organization (SVO) of NMSU
- Scholarships and Internship opportunities
- Veteran Mentorship Program, helping first-year student veterans transition to an academic setting successfully
- Processing of TA and VA education benefits
- Student Computer Lab and Lounge

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

For further information contact:

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

MVP Student Computer Lab and Lounge

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

Costs

Active-Duty

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

NMSU Online

NMSU Online (<http://online.nmsu.edu>) includes 100% online undergraduate and graduate degrees, certificates, and courses within the NMSU system. NMSU Online programs are designed to serve students who may not be able to pursue an education through traditional means. Plus, online programs give students maximum flexibility. Active Duty students admitted to NMSU Online are assessed the Active Military \$250

per credit hour cost fixed rate. Please contact MVP or NMSU Online at online@nmsu.edu or 800.662.6678 for more information.

Dependents Receiving VA Educational Benefits

Per NM 2015 HB 427:

A spouse or child of a veteran of the armed forces is entitled to pay tuition and fees at the rate provided for New Mexico residents; provided that the spouse or child is eligible for benefits pursuant to the federal Post-9/11 Veterans Educational Assistance Act of 2008 or any other federal law authorizing educational benefits for a veteran and the dependents of a veteran. Applications are available at the Military and Veterans Programs, online at <http://mvp.nmsu.edu>, or through the University Student Records Office. Please contact MVP on the required documents needed to complete the waiver application.

Veterans

Veterans receiving U.S. Department of Veterans Affairs education benefits are eligible for in-state tuition through the Veterans In-State Tuition Act by submitting a "Resident Tuition Application for Active Military, Veterans and Dependents of the U.S. Armed Forces" waiver. For further information concerning approved programs and application process, eligible persons should contact Military and Veterans Programs.

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

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

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by VA is available at the official U.S. government website at <https://www.benefits.va.gov/gibill>. (<https://nam01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fbenefits.va.gov%2Fgibill%2Findex.asp&data=01%7C01%7Cemz0724%40nmsu.edu%7C5845cd850ebe483b899f08d833db4ce9%7Ca3ec87a89fb84158ba8ff11bace1eb%7C1&sdata=dodHbJeg6EwzrzZbjmlbt%2BB6bAsHp8eFnUZyFpUNZPQ%3D&reserved=0>)

Allowing Veterans to Attend or Participate in Courses Pending VA Payment

Background

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

Pending Payment Compliance

In accordance with Title 38 US Code 3679(e), New Mexico State University adopts the following additional provisions for any students using U.S. Department of Veterans Affairs (VA) Post-9/11 G.I. Bill® (Ch. 33) or Vocational Rehabilitation & Employment (Ch. 31) benefits, while

payment to the institution is pending from VA. New Mexico State University will not:

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

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

- Produce the VA Certificate of Eligibility (COE) by the first day of class;
- Provide a written request to be certified;
- Provide additional information needed to properly certify the enrollment as described in other institutional policies

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

Responsibility of Students Receiving VA Education Benefits

Students must pursue a degree in a specific program in order to be eligible for VA education benefits. Students must submit their degree plans or Student Academic Requirements (STAR) Degree Audit Report and Concise Student Schedule to Military and Veterans Programs in order to be certified. For continued certification, students must submit their degree plans or STAR Degree Audit Report and Concise Student Schedule to MVP every semester they plan to use VA education benefits.

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

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

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

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

Tuition Assistance

Federal Tuition Assistance (TA) is a benefit paid to eligible members of the Army, Marines Corps, Navy, Air Force, Coast Guard, and Space Force. The Department of Defense (DoD) has given each service the ability to pay up to \$250 per semester credit hour of the actual cost of tuition (no

fees) during the fiscal year (Oct. 1 - Sept. 30). TA must be requested and approved before the start date of the course. Refer to your service portal for specific TA deadlines and procedures. TA is paid directly to the school by the individual military services.

Service members must first be admitted to NMSU before they may enroll in any classes at NMSU. Prior to applying, speak with your military service or Educational Services Officer to know your education options and make an informed decision. Please be aware of NMSU admission and registration process:

1. Service members must apply online to be admitted,
2. Login to my.NMSU.edu (<http://my.NMSU.edu>) to register for classes, and
3. Request TA through your service online portal. Each service has its own criteria for eligibility, application process, and restrictions. Refer to our website for service login information: <http://mvp.nmsu.edu/tuition-assistance> (<https://mvp.nmsu.edu/military-members/federal-tuition-assistance.html>)

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

State Tuition Assistance

New Mexico National Guard Tuition Scholarship Program (NMGTSPP) also referred to as State Tuition Assistance (STA). The scholarship provides eligible members of the New Mexico National Guard an opportunity to complete a bachelor's degree or below. Air National Guard yearly cap is \$8,000. Army National Guard yearly cap is \$4,000. STA fiscal year is from July 1 – June 30. STA is paid directly to the school and is invoiced after the term's Last Day to Drop a Course without a "W" (100% refund). Refer to our website for STA deadlines and procedures at <https://mvp.nmsu.edu/military-members/state-tuition-assistance.html> or contact the Military Veterans Programs for assistance.

MyCAA Spouse Scholarship

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

Regulations

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

Credit for Military Service

New Mexico State University will award academic credit to United States military personnel for courses and Military Occupational Specialties (MOS), based on the American Council of Education Guide (ACE) as well as through national standardized tests, such as CLEP, AP, PEP, and

DANTES. Credit for military-training is in accordance with NMSU Faculty Senate Legislation Proposition 24-07/08, which was passed in May 2008. Military Training and Military Occupational Specialties (MOS) must have a recommendation evaluation by ACE (in the ACE Guide) for credit to be awarded. Courses accepted for transfer credit become part of the student's official NMSU transcript and academic record. If a student wishes to appeal a decision regarding the acceptance of military training/education and/or MOS for academic credit, the student must submit a written statement of appeal to the Dean of the College to which the student has applied. The Dean will review the merits of the appeal and render a decision. The decision of the Dean is final.

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

Note: Students submitting military transcripts for credit evaluation must keep in mind the Maximum Time Frame policy, see the Financial Aid Section (<https://fa.nmsu.edu/satisfactory-academic-progress/>) for more information.

Graduate Student Status (Training Time)

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

Fall and Spring semester, for 16-week terms, full-time enrollment includes 9 or more credit hours. Students are considered three-fourths time if they are enrolled in 7 to 8 credit hours. Half-time enrollment is 5 to 6 credit hours. Students enrolled in less than 5 credit hours are reimbursed for tuition and allowable fees only. For 8-week terms, full-time enrollment includes 5 or more credit hours. Students are considered three-fourth time if they are enrolled in 4 credit hours. Half-time enrollment is 3 credit hours. Students enrolled in less than 1-2 credit hours are reimbursed for tuition and allowable fees only.

There are several sessions within the summer term. For the 10-week summer session, full-time enrollment is 6 or more credit hours. Students are considered three-fourths time if they are enrolled in 4 to 5 credit hours. Half-time enrollment is 3 credit hours. Students enrolled in less than 1-2 credits hours are reimbursed for tuition and allowable fees only. For the 8-week summer session, full-time enrollment is 5 credit hours or more credit hours. Students are considered three-fourths time if they are enrolled in 4 credit hours. Half-time enrollment is 3 credit hours. Students enrolled in less than 1-2 credits hours are reimbursed for tuition and allowable fees only. For the 5-week summer session, full-time enrollment is 4 credit hours or more credit hours. Students are considered three-fourths time if they are enrolled in 3 credit hours. Half-time enrollment is

2 credit hours. Students enrolled in less than 1 credit hour are reimbursed for tuition and allowable fees only.

Military Withdrawal

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

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

1. **Military and Veterans Programs (MVP):** TA/VA students ordered to Active Duty must provide a copy of orders to the MVP office, in Corbett Center Student Union, Room 244, or by email mvp@nmsu.edu. To assist in reporting accurate information to their military service or the VA Regional Office, the student should also provide, in writing, the last day of class attendance.
2. **NMSU University Student Records:** All students presenting their orders to the University Student Records Office, (575) 646-3411, or records@nmsu.edu, will receive a military withdrawal from classes and full tuition and fees refund for that semester.
3. **Bookstore:** Students who still have their receipts for textbooks purchased the semester in which they are called to active duty will be given a full refund for these textbook purchases when they present their orders. Please contact the bookstore for assistance at (575) 646-4431 or nmsu@bkstr.com.

Veterans' Attendance and Satisfactory Progress

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

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

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

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

Military Experience Waiver

Prior to graduating, during the student's junior and/or senior year, NMSU students are required to take two 3-credit Viewing a Wider World

(VWW) upper-division (300-400 level) courses. These courses strongly emphasize the international character and multicultural influences in the fields of study and strengthen information retrieval skills. There are two options that NMSU allows for replacing one of the two courses (3 credits) of VWW requirement with another form of educational experience, these are: (Study Abroad Experience or Military Experience for students who have served at least four weeks of U.S. Military Foreign/Sea Service in a foreign country.

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

1. Obtain a copy of your DD Form 214 or Memo from your Commanding Officer proving your 4-week deployment
2. Provide the above copy to your college academic advisor to request a waiver
3. Wait for your college to approve and confirm

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

Resources for Students

Veteran Mentorship Program

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

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

Goals:

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

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

Military and Veteran Housing

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

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

Service Members Opportunity Consortium (SOC)

The NMSU system has been designated a Servicemembers Opportunity Colleges (SOC) Consortium university. As a member of SOC, NMSU has

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

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

For further assistance contact:

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

Reserve Officer Training Corps (ROTC)

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

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

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

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

For more detailed information about the ROTC programs, see the College of Arts and Sciences departments of Aerospace Studies (<https://catalogs.nmsu.edu/nmsu/arts-sciences/aerospace-studies/>) and Military Science (<https://catalogs.nmsu.edu/nmsu/arts-sciences/military-science/>) in this catalog. Additional information may be obtained by contacting the departments directly at:

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

Aggies Green Zone

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

Aggies Green Zone Allies

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

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

International Students

International students are an essential and valuable part of the NMSU community. International students enjoy all the rights, privileges, and protections of domestic students. They are subject to all the same responsibilities and regulations as their fellow domestic students. However, some special policies apply only to international students. The Office of International Student and Scholar Services (ISSS) ensures requirements are met and explains university standards for admission. Some students not seeking degrees, such as international exchange students, may work directly with the Office of Education Abroad.

Federal Regulations

An international student is any individual attending NMSU while present in the United States on a non-immigrant student visa (F-1, F-2, J-1, J-2, H-4, NATO visas, and possibly others such as students in temporary protected status).

Lawful permanent residents (green card holders) should present documentation of their status to University Student Records and go through the same admission process as U.S. citizens.

The United States Department of Homeland Security has established rules for students in non-immigrant status, such as those with F-1 or J-1 visa types. Some of these rules include the following:

1. For immigration purposes, each student must maintain full-time student status
 - a. Full-time status for fall and spring semesters is defined as 12 or more credits for undergraduates (only three online credits can apply to the full-time requirement).
 - b. Full-time status for summer is defined according to NMSU requirements. Exceptions possible for final semester. Consult ISSS officials for more details.
2. International students may not work off campus without authorization. On-campus employment may be authorized under certain conditions.

3. All international students must maintain an up-to-date record in the ISSS Office. This record must indicate the student's current living address, phone number, and email address.
4. Before admission, a prospective international student must demonstrate the following:
 5. Academic ability to succeed in the chosen course of study.
 6. Adequate financial support to complete the chosen course of study.
 7. English language proficiency as defined by the university.

University Procedures for International Students

Regular Undergraduate Admission (Degree Seeking)

International students are subject to the same admissions standards as all other NMSU students, but some additional requirements apply. This section addresses those additional requirements. Visit <https://issn.nmsu.edu/> for more information.

Applications for admission that include the transfer of credits earned at a non-U.S. university must include a professional Foreign Credential Evaluation (FCE) report from a member institution of the National Association of Credential Evaluation Services (NACES) (<http://www.naces.org/members.html>) for every transcript from a foreign secondary school and/or university attended. The ISSS department highly recommends that applicants consider using SpanTran for their FCE. NMSU has worked with SpanTran to provide applicants with clear understand of which evaluation is needed. SpanTran provides an applicant portal to track and access evaluations. SpanTran is a long standing member of NACES. For more information please visit <https://spantran.com/web/>

English Language Proficiency Requirements

For full undergraduate admission to the university, NMSU requires a score of 520 (paper-based) or 68 (internet-based) or better on the Test of English as a Foreign Language (TOEFL) or a score of 6.0 on the International English Language Testing System (IELTS), or a score of 95 on the Duolingo English test for all international students both non-degree and degree seeking.

A waiver of the TOEFL/IELTS requirement may be considered for:

1. Students who are native speakers of English.
2. Students from the following countries will be exempt from providing a TOEFL score for admission purposes. However, NMSU retains the right to require the applicant/student to take the English Language Placement Test if deemed necessary:
 - a. Anguilla, Antigua, Australia, Bahamas, Barbados, Barbuda, Belize, Bermuda, Botswana, Caicos Islands, Cameroon (Anglophone), Canada (except Quebec), Cayman Islands, Christmas Islands, Cook Island, Dominica, England, Eritrea, Fiji, Gambia, Ghana, Grand Cayman Islands, Grenada, Grenada and the Grenadines, Guernsey, Guyana, Ireland, Israel, Jamaica, Jersey, Kenya, Kiribati Islands, Lesotho, Liberia, Malawi, Malta, Mauritius, Micronesia (Federated States of), Montserrat, Namibia, Nauru, New Zealand, Nigeria, Norfolk Island, Papua New Guinea, Philippines, Scotland, Sierra Leone, Singapore, Solomon Islands, South Africa, St. Christopher, St. Helena, St. Kitts and Nevis, St. Lucia, St. Vincent & Grenadines, Swaziland, Tanzania, Trinidad & Tobago, Tristan

da Cunha Island, Turks & Caicos Islands, Uganda, Virgin Islands, Wales, Zambia, Zimbabwe

- Students completing high school in the United States who (a) have attended the high school for at least two full years and (b) have scored in at least the 75th percentile in English on the ACT.
- Students transferring from a two-year college, community college, or university in the United States who have earned a minimum of 30 acceptable semester credits (45 acceptable quarter credits) with a GPA of 2.0 or better (acceptable credit means classes that require a high proficiency in both written and oral English).
- Students scoring a 70%—(3) or better in English with the International Baccalaureate.

The university reserves the right to require any prospective international student to meet the TOEFL or IELTS requirement.

English Language Placement Test

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

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

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

Proof of Financial Support

The university reserves the right to require advance deposit of funds for any period deemed reasonable before granting admission. Each prospective international student must submit a current financial support document with their application. This document must show that:

- The person providing the financial support has the necessary funds.
- The funds can be transferred from the student's home country to the United States.
- Proof of adequate financial support should be sent directly to ISSS.

Admission Restrictions

International student admission may be prohibited if, Sufficient classroom-based courses are not available to maintain visa status (e.g. courses are online).

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

testing agency, or evaluation agency. All documents should be emailed to admissions@nmsu.edu.

SEVIS Check-In Course & Document Upload Portal

The SEVIS Check-In Course & Document Upload Portal is a mandatory online course for new undergraduate and graduate international students to NMSU. The SEVIS Check-In & Document Upload Portal is a Canvas Course. Students will receive an email invitation to the course once they have set up their NMSU email address. The course consists of 7 modules, and each module must be completed before proceeding to the next module. The Check-In Course covers important legal rules and requirements students must follow to maintain their F-1 status, as well as information about acclimating to New Mexico State University and the Las Cruces community. During the Check-In Course, new international students are required to submit specific documentation and physically check in with the International Student and Scholar Services office.

New international students should activate their NMSU email address <https://myaccount.nmsu.edu/activation> and reach out to the ISSS office at iss@nmsu.edu to be enrolled in the SEVIS Check-In Course. In addition, the NMSU ISSS office will facilitate 3 Mandatory In-person SEVIS Check-In Session. The dates for these sessions will be found in the final module of the SEVIS Check-In Course. and further orientation information.

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

July 1 (application initiated)	Fall Semester
July 15th (all documents submitted)	Fall Semester
October 1st* (Study Abroad and CELP Programs)	Spring Semester
November 15th (application initiated)	Spring Semester
December 1st (all documents submitted)	Spring Semester
Financial Aid Deadlines	

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

**New international graduate students seeking admission to summer terms are encouraged to work closely with their department and The Graduate School to assure that the student is enrolled in a schedule that meets federal enrollment guidelines*

** Contact the Office of Education Abroad for exchange program admission deadlines.*

Graduate International Students

For more information on graduate international student procedures, please visit the Graduate School (p. 74) section of this catalog.

Miscellaneous Regulations

- All international students are required to have student health insurance. Insurance will be automatically billed to the student's account each semester. (See <https://iss.nmsu.edu/newly-admitted-students/health-insurance.html> for more information.)

2. New international students are not permitted to register until all ISSS requirements are met, including attending orientation and taking the English Language Placement Test (when applicable, see English Language Proficiency Requirements section). All international students, are therefore, required to report to the campus to which they were admitted. The following are the offices that a student may need to report to:

- Las Cruces campus: International Student & Scholar Services, Suite 101 of the Educational Services Building (575) 646-2834, iss@nmsu.edu. (Note: Exchange students need to report to the Office of Study Abroad in 132 Garcia Center.)
- Doña Ana Community College: International Student & Scholar Services, Sufficient classroom-based courses are not available to maintain visa status (e.g., courses are online).
- Alamogordo Community College: Office of Student Services, Student Services Building, second floor
- Grants Community College: Office of Student Services, Walter Martinez Building, Main Office Complex

3. Students in non-degree exchange J-1 visa status must be engaged full time in a prescribed course of study. Consult OEA for more details.

4. All international students are required to register at the Aggie Health and Wellness Center within a week of arriving to undergo a TB test or submit results of a current TB test done in the home country within a week of arriving. Guidelines will be provided by the Aggie Health and Wellness Center.

International Exchange Students

An Exchange Student is defined as a visiting student who is coming to NMSU for one semester to one Academic Year but is not seeking a degree. An Exchange Student typically comes to NMSU from one of NMSU's partner universities or one of NMSU's partner consortiums.

All international exchange students are required to be enrolled in NMSU-approved health insurance. Office of Education Abroad will enroll the students and bill the insurance amount to the student's account.

Exchange Students are required to attend a mandatory Orientation before courses begin. Orientation will be scheduled and facilitated by the Office of Education Abroad, abiding by guidelines set forth by the US government per J-1 visa requirements.

Exchange students are subject to the same English Language Proficiency policies outlined in the section on University Procedures for International Students.

Application Process for International Exchange Students

Prior to admission to NMSU, a prospective international exchange student must be nominated from their home university, complete an application with the Office of Education Abroad (OEA) and submit their required documents. The process is as follows:

- Nomination for exchange must be submitted by the Home University to the Incoming Exchange Coordinator by March 15 for Fall semester and September 15 for Spring semester. Please see your home university exchange coordinator for more information and to complete the nomination process.

- Once a nomination is received, students will be directed to make an account at the OEA website: <https://iss.nmsu.edu/>
- The student is then required to complete the Exchange Student Nomination Form Questionnaire and upload the following documents:
 - Passport
 - Transcripts (in English)
 - Financial document showing proof of \$5,000 per semester attended. **ISEP students do not have to provide the financial documents**
 - Current TOEFL scores (2 years or less). See below for acceptable scores.
- All international students, regardless of status, must apply for Admissions to NMSU <https://iss.nmsu.edu/future-students/undergraduate-admissions/step-1.html>. Once the Student's OEA application has been approved, **OEA Staff will submit the documents listed above to Admissions on behalf of the student.**

Academic Restrictions

The majority of the NMSU catalog applies to Exchange Students, with the following exceptions:

- Exchange students must take the English Language Placement Test.
- Courses must be taken at Main Campus only. Community college courses, including DACC, are not available to Exchange Students.
- The Nursing Department is the only department strictly off limits to exchange students, with case-by-case exception by the department and this would have to be approved well in advance of the student being nominated.
- Exchange students are required to abide by all pre-requisite requirements and class size restrictions (i.e., if a course is closed when the student goes to register, an exception cannot be made).
- Online courses are restricted due to visa requirements (no more than three credits can be taken online. Additional fees will apply).

Tuition, Fees & Other Expenses

All costs are given for one term/semester. The university reserves the right to change any of the charges without notice.

Campus Tuition Rates

For a full listing of all tuition rates from the NMSU System please see the University Accounts Receivable (https://uar.nmsu.edu/tuition_fees/) website.

Additional Fees

Undergraduate admission application fee \$25.00

New student orientation fee - virtual session \$99.00

New student orientation fee - in-person session \$165.00

International student admission application fee \$50.00

International student orientation fee \$50.00

Academic Services Fee (per credit) \$20.00

Course Delivery Fee (per credit)— (Grants Only) \$25.00

ASNMSU Fee (Fall/Spring 1-11 credit enrollment)	\$33.50
ASNMSU Fee (Summer 1-8 credit enrollment)	\$12.40
Graduate Wellness/Fitness fee— (Fall/Spring 9-11 credits)	\$159.30
Certificate degree fee	\$10.00
Bachelor or Associate degree fee	\$35.00
Master or Doctorate degree fee	\$45.00
Degree application late filing fee	\$50.00
Late Registration Fee Base Cost	\$25.00
Engineering Technology Fee	\$36.00-145.00

Course Fees (Fees Assessed Per Course)

See the Course Fee (https://uar.nmsu.edu/tuition_fees/) page for a list of courses with additional fees.

Applied Music courses - see Music (p. 770) section of catalog

Mandatory International Student Fees

All international students are required to have health insurance coverage. International student health insurance is provided by GeoBlue. In order to waive the mandatory student health plan, you must meet the following criteria:

- You have coverage on a Government sponsored plan
- You are a dependent on a US based employer sponsored plan
- You have \$25,000 of repatriation of remains coverage and \$50,000 of Medical Evacuation coverage

If you believe your coverage meets these guidelines, please email your proof of insurance and medical plan summary to Kari Mendoza kari.mendoza@relationinsurance.com

For Fall, the deadline to apply for insurance waiver is August 31st .

For Spring, the deadline to apply for insurance waiver is January 31st .

Failure to obtain the insurance waiver by the deadline will result in student being charged for NMSU insurance and the student is liable to pay for the insurance. International students will be required to purchase health insurance for spring and summer during spring registration unless they have applied for spring graduation. (See below) All international undergraduate students will be assessed a \$36 International Student Program Fee each semester.

Optional Fees

Wellness/Fitness Fee

The Wellness/Fitness fee is included in tuition for full-time students at the Las Cruces Campus. Options for part-time students enrolled at Las Cruces Campus include:

	Wellness	Fitness
Term pass for student enrolled in 6-11 credits	\$79.00	\$40.00
Term pass for student enrolled in 1-5 credits	\$105.00	\$53.00
Single visit for student enrolled in 1-11 credits	\$35.00	\$5.00

Tuition, Fees, and Other Expenses

The Wellness fee grants access to the Student Health Center with charges accruing for medications, lab work, testing or procedures. The Fitness fee grants access to the Student Activity Center.

Health Insurance

Students who have access to the Campus Health Center may choose to purchase a commercial insurance policy offered through the Health Insurance Marketplaces established by the Affordable Care Act (ACA). These exchanges are intended to provide consumers with a new way to shop for, compare costs and coverage benefits, and enroll in insurance coverage. For more information visit: www.healthcare.gov (<https://www.healthcare.gov>) or www.bewellnm.com (<http://www.bewellnm.com>)

Housing Services

See the Students Resources (p. 1323) section for room descriptions, accommodations, application process, deposit requirement, regulations and eligibility.

For current rate information, please visit our website at: <http://housing.nmsu.edu/> (<http://housing.nmsu.edu/>).

Dining Services

See the Dining Services (<https://dining.nmsu.edu/>) section for meal plan descriptions & pricing, application process, deposit requirement, regulations and eligibility. Freshmen living on campus must choose between Aggie Unlimited and Aggie Choice Plans.

Late Registration Fee

A late registration fee of \$25 is imposed if registration has not been completed before the late-registration period begins. Failure to make scheduled payments with the University Accounts Receivable on due dates will result in additional liability.

Payment of Charges

By enrolling in classes at NMSU, a student makes a financial commitment to pay the tuition and fee charges associated with his/her enrollment. The enrollment action constitutes a financial obligation between the student and NMSU and that all proceeds of this agreement will be used for education purposes and constitute an education loan pursuant to 11 U.S.C 523(a) (8). Terms and Conditions of Course Registration are posted on the University Accounts Receivable (UAR) website and available at time of Registration. Payments can be made by mail, web, telephone, or in person at University Accounts Receivable. Cash, checks, money orders and limited types of credit cards are accepted. All financial aid received must be paid towards balances owed. Additional penalty charges will be assessed for failure to make payments when due. The University reserves the right to cancel registration of any student who fails to pay, when due, any indebtedness to the institution if not completed by the deadlines as outlined on the UAR website under important dates related to your Student Account. Transcripts and diplomas will be withheld until all financial obligations are paid in full. Students are prohibited from registering for a term/semester until all previous debts due to the University are paid in full.

Payment Plan

For current information, please visit the Payment Plan website at <https://student-accounts.nmsu.edu> (<https://student-accounts.nmsu.edu/>)

Tuition Adjustments, Refunds and Forfeitures

Students officially withdrawing from all courses or dropping a course(s) during a semester or term are eligible for a 100-percent refund of tuition and fees through the deadlines listed online as outlined on the University Student Records website under Important Dates for Students for each term. Students withdrawing from a course(s) after that deadline will not be eligible for a refund and will remain liable for payment of full tuition and fee charges. Non-attendance does not constitute an official course drop or withdrawal. It is the student's responsibility to withdraw from the university and/or drop a course if he/she decides to not attend once enrollment has taken place. All charges due to NMSU must be paid before refunds or adjustments will be permitted.

In cases of academic or disciplinary suspension, eligibility for tuition refunds and adjustments will depend on the conditions of the suspension and will be entirely at the option of the institution. Should unforeseen circumstances beyond the reasonable control of New Mexico State University result in curtailing classes, closing residence facilities, or otherwise withdrawing services that are a normal function of the institution, refunds of any nature will be at the discretion of the college/university administration.

Residence hall rentals and dining hall charges may be refunded in accordance with schedules adopted by these departments.

Delinquent and Prior-Term Balances

NMSU reserves the right to cancel the registration of any student who fails to pay, when due, any indebtedness to the institution.

Transcripts will be withheld until all financial obligations are paid in full.

Dishonored Financial Transactions - Checks, Credit Cards, ACH Transactions

The University charges a penalty on all dishonored cash instruments. Personal checks will not be accepted from students who have had previously dishonored checks.

Estimating Other Expenses

In addition to the direct costs stated above, other expenses per semester may include such items as textbooks and supplies and personal expenses.

Cooperative Education

Students participating in the Cooperative Education Program who receive academic credit pay the same tuition and fees as regularly enrolled students. Work phase students who are assigned to campus or a nearby off-campus workstation may pay for the student wellness/fitness as if they were a part-time student enrolled in 1-5 credits.

Ways to Qualify for Lower Tuition Rates

Resident or nonresident status is determined in accordance to a uniform definition established for all New Mexico institutions by the Higher Education Department, State of New Mexico, NM Administrative Code (NMAC) 5.7.18. The University Student Records Office administers residency. Information on the following programs and offices that administer the reduced rate program may be obtained from the University Admissions, the University Financial Aid and Scholarship Services.

- American Indian Agreement
- Athletic Grant
- Colorado-Arizona Reciprocal Agreement
- Dual Credit
- Fire Fighter and Peace Officer Survivor Scholarship
- Foreign Military Dependent
- Foreign Military Spouse
- Foreign Military Stationed in New Mexico
- Foster Care
- Graduate Assistantship
- Immigrant Student (NM HS GRAD)
- Military Dependent
- Military Spouse
- Military Stationed in New Mexico
- NM Competitive Scholarship
- Part-time Students
- Senior Citizen Waiver
- Summer Session
- Texas 135
- Veteran Waiver
- WRGP
- Western Undergraduate Exchange

WUE states include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming and the Commonwealth of the Northern Mariana Islands. For more information about any of the above ways to qualify for lower tuition rates please contact the University Accounts Receivable Office or the University Student Records Office.

Contact Information

For more information, contact:

University Accounts Receivable, MSC 4570
New Mexico State University
PO Box 30001

Las Cruces, NM 88003-8001

Phone: (575) 646-4911

https://uar.nmsu.edu/tuition_fees (https://uar.nmsu.edu/tuition_fees/)

Financial Aid & Scholarship Services

University Financial Aid and Scholarship Services administers a broad spectrum of grants, scholarships, work-study funds, and loans in an attempt to meet the financial need of NMSU students.

Students applying for financial aid must complete the Free Application for Federal Student Aid (FAFSA). Students must submit the FAFSA every year. The information reported on the FAFSA calculates a student's Expected Family Contribution (EFC). The EFC is an index number used to determine your eligibility for federal financial aid. The formula that establishes the EFC is instituted by law and considers your family's taxed and untaxed income, assets, and benefits (such as, unemployment or Social Security).

NMSU uses the EFC to determine your financial aid award. Some college scholarships also require an EFC. All information provided to the University Financial Aid and Scholarship Services is confidential.

Students can begin applying for financial aid by submitting a FAFSA through studentaid.gov (<https://studentaid.gov/>). Please refer to the NMSU-Las Cruces, Financial Aid and Scholarship Services web site for more information on awards and policies at fa.nmsu.edu.

General Eligibility Requirements

To receive financial aid you must be admitted to NMSU as a degree-seeking student in an eligible degree or certificate program and demonstrate that you are qualified to obtain an education by:

- Having a high school diploma or recognized equivalent such as a General Education Development (GED) certificate or
- Completing a high school education in a home-school setting approved under state law or
- Achieving a passing score on an independently administered ATB test approved by the Education Department as a student who first enrolled in an eligible program of study *prior* to July 1, 2012 without a high school diploma, recognized equivalent, or did not complete home schooling, and could continue to qualify based on completing 6 credit hours from that eligible program.
- Being a U.S. citizen or eligible noncitizen (state funded scholarships are available to undocumented students).
- Having a valid Social Security number. If you do not have a Social Security number, you can find out more about applying for one at ssa.gov (<http://www.ssa.gov/>).
- Meeting satisfactory academic progress (SAP).
- Signing a statement on the FAFSA certifying that you will use Federal student aid only for educational purposes.
- Certifying that you are not in default on a loan under any title IV or HEA loan program, and have not exceeded annual or aggregate loan limits, and you are not liable for grant overpayment.

Financial Aid Awards

All financial aid awards are based on information provided by the student and/or parents, availability of funds, and eligibility requirements. Any award may be revised based on changes in enrollment, cost of attendance, application for graduation, family contribution or satisfactory academic progress. Withdrawals or reductions in enrollment may affect an award or any future awards. Financial Aid will not pay for audited courses or some repeats.

Grants

The Federal Pell Grant is a federal grant available to undergraduate students with documented financial need. If the Pell Grant is insufficient to pay educational expenses, the student may be eligible to receive other types of aid, including a Federal Supplemental Educational Opportunity Grant (SEOG) or Leveraging Education Assistance Partnership Program Grant (LEAP), and/or other miscellaneous grants. These grants are offered to undergraduate students who demonstrate exceptional financial need. Funds are limited and are awarded based on need and the priority date. For more information, contact University Financial Aid and Scholarship Services or visit the university's financial aid website at: fa.nmsu.edu/. (<http://fa.nmsu.edu/>) Generally, grants do not have to be repaid.

Work-Study Programs

Work-study is a federal or state-funded financial aid program that provides funds for part-time employment to students. Students

earn their semester work-study award through hourly pay within on-campus or academic-related jobs. These awards are based on early FAFSA submission, financial need as determined by FAFSA, and funding availability, so students are encouraged to apply before the March 1st priority deadline. Work-study jobs are a great opportunity for students to earn income and work within a professional career-oriented position. Students can apply for work-study positions using the NMSU Handshake application at nmsu.joinhandshake.com/. For more information on the U.S. Department of Education student aid programs, go to studentaid.gov or visit the NMSU Financial Aid web site at fa.nmsu.edu.

Scholarships and Other Aid

Many students finance part of their education with scholarships, which may be awarded for academic achievement, special skills, talent and/or based on the applicant's calculated financial need.

The NMSU System offers a variety of scholarships to incoming freshman, transfer, continuing and graduate students. State, institutional and private scholarships may also be available but amounts, deadlines and eligibility requirements vary. For more information, contact University Financial Aid and Scholarship Services or visit the university's scholarship web site at fa.nmsu.edu/scholarships (<http://fa.nmsu.edu/scholarships/>)

To be considered for most scholarships through the NMSU System you are required to apply online through Scholar Dollar\$, at scholarships.nmsu.edu (<https://scholarships.nmsu.edu/>) each academic year. One scholarship application serves all students in the NMSU system, regardless of campus.

Federal Direct Subsidized Loans

This is a loan program for eligible undergraduate students who demonstrate financial need. The U.S. Department of Education pays the interest on a Direct Subsidized Loan while the student is enrolled in school at least half-time (six-credit hours).

All undergraduate students who borrow for the first time after July 1, 2013 are subject to a maximum-time period to receive Federal Direct Subsidized Loans. Students may not receive Federal Direct Subsidized Loans for more than 150% of the published length of their academic program (measured in academic years). A complete explanation of Subsidized Loan usage limits is available at: fa.nmsu.edu/loans/federal-direct-loans. (<https://fa.nmsu.edu/loans/>)

Federal Direct Unsubsidized Loans

Loans that are not need-based and offered to eligible undergraduate and graduate students. Unlike other federal loans, interest accrues while the student is attending school.

Federal Direct Loan Requirements

Students receiving a subsidized or unsubsidized Federal Direct Loan, must complete an online Entrance Counseling session and a Master Promissory Note (MPN) before NMSU will issue the funds. In addition, students are required to complete the Student Loan Acknowledgment every academic year. Once Federal Loan Borrowers graduate, or withdraw from the institution, they must complete the Exit Counseling to avoid delays in receiving their transcripts or diplomas. Students may complete all these requirements at studentaid.gov (<https://studentaid.gov/>).

Repayment of a Federal Direct loan begins six months after graduation or six months after enrollment drops below half time (less than six

credits for undergraduate students and less than 5 credits for graduate students).

Withdrawals

Recipients of financial aid grants and loans who stop attending class, drop credit hours, or withdraw may be required to return all or a portion of awarded Title IV funds. Further information regarding the Return of Title IV funds is available on the NMSU-Las Cruces web site at fa.nmsu.edu/return-of-title-iv-funds (<https://fa.nmsu.edu/title-iv/>).

Financial Aid Satisfactory Academic Progress

Federal regulations require that financial aid recipients meet certain academic standards to be eligible for federal aid. The NMSU Office of Financial Aid will review the Satisfactory Academic Progress of financial aid recipients at the end of each payment term/semester to ensure continued eligibility. When evaluating SAP, all enrollment periods are considered regardless of whether the student received financial aid during those terms. For transfer students, credits accepted for their NMSU-degree program are counted toward Maximum Timeframe, but the transfer GPA is not calculated in the cumulative GPA for the Completion Rate. The Financial Aid SAP standards are not the same as the NMSU System's Academic Standards of Progress criteria. Students may learn more by visiting fa.nmsu.edu/sap.

Elements of Financial Aid Satisfactory Academic Progress

- Federal regulations require all students receiving financial aid to meet minimum qualitative and quantitative standards in order to maintain their eligibility for aid. Below are the minimum standards for SAP. The qualitative component of SAP measures a student's academic achievement by their cumulative GPA. The quantitative component is comprised of two parts: Completion Rate and Maximum Timeframe. Below are the descriptions of each SAP standard:

Grade Point Average (GPA)

- Undergraduate students must maintain a 2.0 cumulative GPA or greater on all hours attempted at NMSU. This is equivalent to an average letter grade of "C" or better.
- Graduate students must maintain a 3.0 cumulative GPA or greater. This is equivalent to an average letter grade of "B" or better.
- Completion Rate: Pace of Progression**
 - All students, both undergraduate and graduate are required to pass and complete 70% of all classes attempted.
 - Grades of F, W, U, I or RR will be considered hours attempted but not completed.
- Maximum Time Frame: Pace of Progression**
 - Students must attain their degree within 150% of the published credits required for a degree program.
 - Transfer-credit hours counted towards the student's degree program will be included in the maximum timeframe.
 - Limited developmental coursework will not count in the maximum timeframe.

Financial Aid Warning

"Warning" is a status assigned to a student who fails to meet satisfactory academic progress at the end of the payment term/semester. A student

on Financial Aid warning may continue to receive financial aid for one payment term while in this status. If the student has not returned to satisfactory standing after this additional semester, they will be suspended from further financial assistance until the satisfactory progress standards are met.

Financial Aid Suspension

Students who do not meet the SAP standards will be placed on Financial Aid Suspension. Students who have their financial aid revoked due to the failure to meet the SAP standards are ineligible to receive financial aid and are responsible for payment of their own tuition and fees. Students will remain on financial aid suspension until they are able to meet both the quantitative and qualitative SAP standards, or have an appeal approved by the campus' Financial Aid Office.

The Appeal Process

Students suspended from financial aid may appeal the suspension if there are extenuating circumstances affecting their progress. Students who would like to appeal the suspension must submit an appeal form, available at: fa.nmsu.edu (<http://fa.nmsu.edu>). They must also submit all supporting documentation to University Financial Aid and Scholarship Services.

A committee will review the appeal and may grant reinstatement of financial aid based on the extenuating circumstances that directly contributed to the deficient academic performance. To receive timely decisions from the committee, students are encouraged to submit appeals and supporting documentation by the priority date found at fa.nmsu.edu/sap (<https://fa.nmsu.edu/sap/>).

Contact Information

For more information, contact:

Las Cruces Campus Financial Aid Office
MSC 5100
PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-4105
<http://fa.nmsu.edu/> (<http://fa.nmsu.edu>)

The Graduate School

New Mexico State University (NMSU) has a long history of providing formal graduate study. The first master's degree from NMSU was awarded in 1896. In 1921, the NMSU president appointed a committee to oversee graduate study. The Graduate School was formally established in 1956 with a full-time dean, and in the same year, 57 master's degrees were awarded.

The Graduate School mission is to provide affordable access to high-quality educational experiences, new modes of graduate education, and works with dedicated faculty to help students from diverse cultural and economic backgrounds reach graduate school success. Our vision is to empower students to succeed and excel while pursuing a meaningful education. In doing so, we cultivate the collaboration of academic, professional and personal skills while helping students graduate in a timely manner.

Diversity and inclusion statement

The Graduate School promotes a high-quality learning environment that embraces diversity and inclusion of every background, race, ethnicity, and

life experience. NMSU believes that a diverse student body is essential for learning, and NMSU is proud to be one of the few high-research universities that reflects Hispanic, Native American, other American cultures, as well as cultures from around the world. Our rich and diverse community includes international students from Africa, Asia, Central/South American, and Europe. The goal of NMSU and the Graduate School is to be fully inclusive in all forms of diversity, and to provide an environment where all are welcomed and empowered to be themselves and thrive.

Policies

Since graduate degrees are awarded for attainment in scholarship, the requirements stated in this catalog are to be considered as minimal. The major department or the dean of the graduate school may make additional requirements as deemed necessary for each candidate. Responsibility for securing approval of the proposed program of study rest with the student and is subject to the approval of the respective department head or program director. Frequent consultation with the advisor is essential to satisfactory progress toward degree completion.

Graduate Degree Programs

For a full listing of the Graduate Programs offered at New Mexico State University; please see the Graduate Admissions webpage <https://apply.nmsu.edu/> (<https://apply.nmsu.edu/apply/?id=1c3c41ea-b5f9-48ef-83c3-b085794ba277>)

Admission for Graduate Students

A student seeking admission to graduate school at NMSU must hold a minimum of a bachelor's degree or an advanced degree from a regionally accredited institution. The academic program of the completed degree should be equivalent to a comparable NMSU degree's requirements.

Application materials:

- Students must submit a complete Application for Admission.
- Other supplemental documents required by the academic department, may include but are not limited to, unofficial college transcripts, test scores (i.e., TOEFL, IELTS, Duolingo, GRE, GMAT), statement of purpose, writing samples, and letters of recommendation.
- Student must send official transcripts from their prior colleges or universities directly to the Graduate School.

Formal application is required of all prospective students, including graduates of NMSU, who seek admission to a graduate program. If a student is recommended for admission by the academic department, the student must submit all required application materials directly to the Graduate School.

No student is officially admitted into a graduate program until a Certificate of Admission has been issued by the Graduate School. The Graduate School considers the Certificate of Admissions valid for a one-year period. Some academic departments may require re-application if the applicant does not enroll in the semester noted in the certificate

Categories of Graduate Students

A student seeking admission to a graduate program is assigned one of the following categories based upon previous academic performance. Click here (<https://catalogs.nmsu.edu/nmsu/regulations-policies/#academicprogramsofstudytext>) for complete regulatory information within the different programs of study:

Doctoral Regular

To be considered for admission to a doctoral program, an applicant must have a minimum grade-point average of 3.0. Some doctoral degree programs also require a master's degree or its equivalent. NMSU does not admit a doctoral student on a provisional basis.

Master's Regular

An applicant whose scholastic record is satisfactory will be admitted as a regular student. This classification includes:

1. An applicant whose grade-point average is greater than or equal to 3.0, or a grade-point average greater than or equal to 3.0 in the last half of undergraduate work,
2. An international applicant whose grade-point average (or its equivalent) is greater than or equal to 3.0, from a four-year bachelor's degree or its equivalent.
3. A continuing graduate student whose grade-point average is greater than or equal to 3.0.
4. A student with prior graduate work at another institution whose minimum grade-point average is 3.0.

Master's Provisional

An applicant whose scholastic record does not meet the Master's Regular standards can be admitted provisionally. Students admitted as a Master's Provisional include:

1. A transferring graduate student whose cumulative grade-point average is less than a 3.0.
2. Students whose grade-point average the last half of undergraduate work is less than a 3.0 but has a minimum grade-point average of 2.5.

A student admitted provisionally must complete their first three courses, a total of 9 credits of graduate work, with a minimum grade-point average of a 3.0. A provisional student who does not meet the 3.0 grade-point average after 9 graduate credits hours is subject to dismissal.

A student admitted on a provisional basis is prohibited from working as a teaching assistant. However, they may work as a research assistant or a grader for one semester. To hire a provisional student, departments must submit an official letter to the Graduate School requesting permission.

Master's Undeclared

An applicant that has not decided on a specific graduate degree program and has an undergraduate minimum grade-point average of 2.5 may be considered for admission as an undeclared master student. International students with an F-1 visa are not eligible for undeclared master status.

Undeclared Student Enrollment Restrictions

- Undeclared students are restricted to enrolling in a maximum of 9 graduate credit hours. To continue enrollment the student must apply and be admitted into a degree-seeking program.
- Course restrictions placed by the graduate department may constrain enrollment by an undeclared student.
- An undeclared master's student is restricted to transferring 9 graduate credit hours to a degree program.
- Undeclared students are not eligible to receive a graduate assistantship.
- Only undeclared regular status students who meet all Title IV eligibility requirements are eligible to receive federal financial aid for one consecutive 12-month period beginning the first term of

enrollment. Questions about financial aid and undeclared master's should contact Financial Aid and Scholarship Services.

Transfers from Undeclared to a Degree Program

Students transferring from an undeclared master's to a degree program require a new Application for Admission.

- If the student has 9 completed graduate credit hours, the cumulative minimum grade-point average must be 3.0 for the request to be considered.
- If the student transferring to a degree program has fewer than 9 completed graduate credit hours their admission is based on their undergraduate GPA (between 2.5 to 2.9 is Master's provisional; 3.0 or greater is Master's regular).

Graduate Certificate Program Students

Graduate certificate programs are designed to develop specific skill training and enhance a student's expertise to meet employment needs locally, regionally, nationally, and globally. A graduate certificate is a focused collection of courses, consisting of 12-18 credits, in a given discipline or a set of related disciplines.

A graduate certificate is not an official graduate degree of NMSU. A student that successfully completes a certificate program at the graduate level will receive a certificate of completion statement on their official transcript and a formal certificate from the Graduate School. A student has three years to complete a graduate certificate program.

The graduate certificate program is offered to both currently enrolled, degree-seeking students and students who enroll solely to obtain a certificate. Students currently enrolled in degree programs must apply separately to the graduate certificate program. Students wishing to enroll only in a graduate certificate program must meet all admissions criteria. Successful completion of a certificate program does not guarantee admission into a graduate degree program. A student enrolled in a certificate program must apply and be accepted into a graduate degree program.

A student enrolled in a graduate certificate program cannot transfer credits from another institution towards the completion of the certificate. However, transfer credits taken in a graduate certificate program may be applied towards an NMSU graduate degree program in the same focus area. The number of transfer credits will be determined by the program (program of study or degree audit). The time limit on transfer credits is 5 years after the completion of the certificate.

Students enrolled in a graduate certificate program *only* are not eligible for a graduate assistantship.

Master's Accelerated Program (MAP)

Master's accelerated programs (MAP) provide the opportunity for academically qualified undergraduate students to begin working on a master's degree during their junior and senior years of undergraduate study. A graduate program has the discretion to use up to 12 credits of NMSU coursework (450 level or higher) towards the completion of a master's degree. To be eligible for MAP, students must have a minimum GPA of 2.75 (Departments can require a higher GPA). MAP students must complete 60 credit hours of undergraduate work of which 25 credit hours must be completed at NMSU. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. You can find more details about the MAP Policy and MAP form

here (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html#MAP1>).

Application Dates and Deadlines

Contact the graduate degree program for published application deadlines. If the graduate program does not publish a deadline, the Graduate School encourages the applicant to apply by March 15th for fall enrollment and by October 15th for spring enrollment to be considered for financial support. The Graduate School will continue to accept applications 30 days before the first day of classes. No application materials will be returned to the applicant.

Transcripts

An applicant is required to have one official transcript from each institution attended sent directly to the Graduate School.

If the applicant's undergraduate coursework is not complete at the time of application, they must submit an official transcript showing the completion this course work directly after the degree has been granted.

Standardized Tests

Certain graduate programs may require standardized test scores for admission. An applicant may be required to take one or more of the following examinations as determined by the academic department: Graduate Record Examination, the Miller Analogies Test, the Graduate Management Admission Test.

See academic department program description for required testing.

Readmission

An NMSU student who has been out of school for more than two consecutive terms is required to submit a formal application for readmission to NMSU. The application will be reviewed by the Graduate School and academic department. The application should be submitted at least 30 days before the start of the semester.

A student who has attended other institutions during their absence is required to submit official transcripts to the Graduate School before the date of registration and be eligible to return to the college or university last attended. Student's readmission status and academic standing will be determined by previous NMSU academic standing, taking into consideration their academic performance at other institutions during the applicant's absence from NMSU.

Renewal of Application for Admission

The admission credentials for an applicant who does not register for the semester admitted are retained at the Graduate School for a period of one calendar year from the date of application. At the end of this period, credentials are discarded. A student wishing to renew their application after the one-year lapse must submit a new application.

Denied Admission

The Graduate School or the department may deny admission if the scholastic record or prior program of study is judged inadequate. If denied admission by a specific academic department, the applicant may be eligible to seek undeclared status as described in Categories of Graduate Students. If denied by the department, the student may wish to contact the department for additional information.

Admission may be denied to an otherwise qualified applicant when the desired program lacks resources to accommodate additional enrollment.

A student who is denied admission to one program and wishes to be considered for another program must complete a new application for the second program.

Application documents are retained by the Graduate School for one calendar year.

Non-Degree Admission

Non-degree admission is designed to meet the needs of an applicant who does not wish to pursue a degree or who has not yet completed the application process to a specific department. No more than 9 graduate credits earned in non-degree status may be transferred to a graduate degree program. Academic advising for non-degree students is obtained from the academic department. NMSU only recognizes graduate credit transfers for non-degree work from the University of New Mexico (UNM). Transfer credit is restricted to 6 credits with the approval of the appropriate department, the college dean, and the graduate dean.

A student classified as non-degree is not eligible to receive financial aid, student employment, or institutional tuition waivers; to participate in student government or intercollegiate athletics; and to receive benefits from veterans' programs.

Visiting Student

A visiting student is a student taking graduate credit to transfer to his or her home institution. An Application for Admission to the Graduate School must be submitted 30 days before registration. The student is required to submit unofficial transcripts. The academic department admits a visiting student. Visiting students are not eligible for undeclared status or for graduate assistantships.

Out-of-State Students and Legal Jurisdiction

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

Contact Information

For more information, contact:

Graduate School, MSC 3-GS
New Mexico State University
PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-5746
<http://gradschool.nmsu.edu/> (<http://gradschool.nmsu.edu/>)

International Graduate Students

A graduate international student must hold at minimum a four-year bachelor's degree or its equivalent and is able to demonstrate English proficiency, both written and oral by submitting an official TOEFL or IELTS score report.

English Proficiency for Admission

Doctoral students must provide official proof of an English Proficiency minimum score as follows:

- TOEFL 79 IBT; 550 PBT
- IELTS 6.5
- Duolingo 105

International students can be admitted into a master's degree program with lower English Proficiency scores, as follows:

- TOEFL 68 to 78 IBT: 549 PBT
- IELTS 6.0
- Duolingo 95 to 104

Students with scores in this range are required to sit for the English Placement Exam prior to beginning academic coursework. (The International Student and Scholar Services Office will arrange this test upon arrival). If the results of the English Placement Exam do not meet the requirements for academic coursework, the student may be required to take additional academic English classes as part of the degree requirements (ENGL 1105M (<https://catalogs.nmsu.edu/search/?P=ENGL%201105M>) Intermediate ESL Composition and Grammar Review and/or ENGL 471 M (<https://catalogs.nmsu.edu/search/?P=ENGL%20471%20M>) Scholarly Writing for International Graduate Students).

The university reserves the right to require any prospective international student to meet the TOEFL or IELTS requirement.

Enrollment

All international graduate students on F-1 or J-1 visas are required to comply with Department of Homeland Security regulations governing maintenance of status related to full-time enrollment and making normal progress toward completing a degree. Therefore, all international graduate students are required to enroll in 9 or more credits (exclusive of audited work) during fall and spring semesters.

Transfer of Graduate Credits into a Degree Program

Graduate credits taken at NMSU as undergraduate electives may be transferred to the student's graduate program at NMSU. Graduate credits from another university may be transferred to NMSU, provided the credits were earned on the campus of an accredited institution. Transferred course work (credit and hours) is maintained separately from NMSU course work. Transfer credits must meet the same time-limit requirements (seven years) as master's level graduate classes at NMSU.

Immediately after initial enrollment in a graduate programs, students must submit a Transfer of Credit request form (<https://eltnmsu.sharepoint.com/sites/GraduateSchool/Forms/Forms/AllItems.aspx?id=%2Fsites%2FGraduateSchool%2FForms%2FGeneral%20Graduate%20Forms%2FGeneral%20Graduate%20Forms%2Ftransfer%5Fof%5Fcredit%5Fform1%2Epdf&parent=%2Fsites%2FGraduateSchool%2FForms%2FGeneral%20Graduate%20Forms%2FGeneral%20Graduate%20Forms>) to obtain formal permission from their advisor, department head, and the Graduate School dean to transfer graduate-level course work. The department has the responsibility to accept or reject transferred credits depending on various conditions, such as the course credit fits logically into an NMSU degree program, accreditation requirements, level of course work, grades, and other conditions deemed relevant by the department. The department may also require work to be validated by examination or until the work done at another institution is proven by satisfactory work in residence.

Special conditions:

- Master's degree - To meet residency requirements, students must take at least 50 percent of their required coursework at NMSU.
- Master of Fine Arts - Before consideration for candidacy, the department head and the graduate advisor will determine the number of transferable credits from a previous graduate program.
- Specialist in Education Degree - A maximum of 6 graduate credits earned at another approved institution may apply to the Specialist in Education degree. Transfer credits must have been earned during the five-year period prior to completion of the specialist in education degree.
- Graduate Certificates - Students enrolled in certificate programs may not transfer credits from another institution towards the completion of the certificate program offered by NMSU.
- Doctoral degree – students may transfer course work that the departments deem as logically fits into the program of study.

Graduate Certificates

Students enrolled in certificate programs may not transfer credits from another institution towards the completion of the certificate program offered by NMSU. However, they can transfer credits taken in a graduate certificate program at NMSU into a graduate degree program at NMSU, provided that the courses will lead towards a graduate degree in the focused area of the certificate program. The number of transfer credits will be determined by the program of study. The time limit on course transfer is five years after the completion of the certificate.

Master's Level

In order to meet residency requirements at the master's degree level, students must take at least 50 percent of their required coursework at NMSU.

Masters of Fine Arts

Before consideration for candidacy, the department head and the graduate advisor will determine the number of transferable credits from a previous graduate program.

Specialist in Education Degree

A maximum of 6 graduate credits earned at another approved institution may apply to the Specialist in Education degree. Transfer credits must have been earned during the five-year period prior to completion of the specialist in education degree.

Doctorate Level

At the doctoral level, students may transfer course work that logically fits into the program of study.

Funding Opportunities for Graduate Students

The Graduate School offers awards, assistantships, and fellowships to qualified graduate students. All awards require faculty nominations. Continuing and newly admitted students can request either a faculty member or the department head to nominate them for the Graduate School awards. The student must be admitted to the Graduate School before a request for an assistantship or fellowship will be considered by the department or the Graduate School.

In selecting individuals for any assistantship or fellowship and in the administration of appointments, New Mexico State University does not discriminate on grounds of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex (including pregnancy), sexual orientation, spousal affiliation, or veteran status. The University limits the number of years a student may be supported on funds from the state of New Mexico. Departments may place additional limitations on the years of support. For detailed information, application process and deadlines please consult [https://gradschool.nmsu.edu/future-students/How To Apply](https://gradschool.nmsu.edu/future-students/How-To-Appl)

A student should check **Graduate Assistant Employment Guidelines of the Graduate School**.

Assistantships

Graduate assistantships, including teaching and research, offered by New Mexico State University are awarded primarily by the students' academic department. Employment guidelines may be found at: https://gradschool.nmsu.edu/ga-and-union/grad-assistant-forms/Guidelines_on_Employment_of_Graduate_Assistants%20Jan%202023.pdf

Students with assistantships must maintain full-time status by enrolling in and successfully completing 9 credit hours each semester. Students must also maintain a 3.0 grade-point-average. Courses taken for audit do not count in the minimum graduate assistant course load requirement. Graduate assistants should take no more than 15 course credits per semester. During their first semester at NMSU, if course deficiencies are identified, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits to be eligible for a graduate assistantship. The graduate assistantship duties typically require students to work 20 hours per week (full-time, fall and spring).

Teaching Assistantships

A student seeking appointment as a teaching assistant will be required to demonstrate proficiency in communication skills necessary for satisfactory service in the classroom. All graduate students awarded an assistantship must complete the online mandatory orientation offered by the Graduate School. Departments may require students to complete workshops or orientations to qualify for assistantships.

Eligibility for teaching assistantships includes:

- Acceptance by and subsequent registration in the Graduate School and academic department
- Classification as a "regular" graduate student
- All international students seeking a teaching assistantship must demonstrate proficiency in English and competency in Pedagogy.

Teaching Assistantships for International Students

All international students seeking a teaching assistantship must demonstrate proficiency in English and competency in pedagogy. Prior to their first semester as a teaching assistantship, international students must undergo the NMSU International Teaching Assistant screening (ITAS) administered by the NMSU English Department on behalf of the Graduate School. International graduate students wishing to hold a teaching assistantship should check with their department to determine when they should arrive on campus to meet the screening requirement. The ITAS can be waived for international students who hold a degree from an accredited university in the United States, or a country where English is the official language of instruction. Departments also have the discretion to allow waivers for special circumstances.

The ITAS requires that a teaching assistant candidate deliver a short, ten-minute teaching demonstration of an introductory undergraduate level course in a topic relevant to their area of studies. The demonstration is observed by English Department faculty and an actual undergraduate student. Based on the results of the screening, the English Department observers present a report of findings to the department head where the graduate student will be a teaching assistant. Students who pass the screening exam are immediately eligible for assignment to a teaching assistantship.

Students who do not pass the screening exam must enroll in and satisfactorily complete **COMM 485, "International Teaching Assistant Development"** course before being eligible for a teaching assistantship. International students who don't pass the screening exam may be eligible to serve as graders for their academic departments. The academic departments must receive approval from the Graduate School to hire these students.

Assistantships for Provisional Graduate Students

Graduate students accepted on a provisional basis cannot serve as teaching assistants. However, they can serve as research assistants. Eligibility includes:

- Acceptance by and subsequent registration in the Graduate School and academic department
- Classification as a "provisional" graduate student
- Enrolling in and successfully complete 9 graded credits with a minimum of 3.0 GPA.
- Funded on research projects of the faculty of NMSU

Provisional students can also be hired as graders for one semester. The department must hire the student as a Graduate other at the time of completing the hiring path, so that the student be allowed to work as a grader.

Diversity Graduate Assistantships

The diversity awards are awarded thru the nominations process and allocated to departments on a competitive basis to help increase the diversity and quality of the student body. Departments will commit matching funds to support these awards for the student. The diversity award can be used to recruit domestic students. Please note that the award is for an academic year. Departments will need to commit funds to the selected student for at least one additional semester or preferably a year. The selected student must be admitted to the department prior to being nominated for the diversity award.

Fellowships

The Graduate School maintains a Fellowship and Grant Information webpage (<https://gradschool.nmsu.edu/Funding%20and%20Financial%20Aid%20.html>) providing a database of grants, fellowships and assistantships for graduate students. The university offers a number of fellowships available to both new and continuing students.

Graduate Assistant Tuition Fellowships

As an opportunity for departments to recruit and nominate outstanding graduate students to their programs, the Graduate School awards tuition fellowships to graduate assistants. Master's degree students will receive up to two years of support and doctoral degree students will receive up to three years of support. In order for students to qualify for a second and third year of support, they must maintain their status as graduate assistants for the duration of the tuition fellowship period. These awards are for students receiving 10 hour or 20 hour graduate assistantships.

Students must be enrolled in and successfully complete 9 graded credits with a minimum of 3.0 GPA. The tuition fellowships are paid for fall or spring semesters only and do not include fees.

McNair Graduate Assistantships

The Graduate School wishes to support and recognize the success of the McNair program by offering several McNair Graduate Assistantships for one academic year with a match of one year from a department. Students must be nominated by the department for this award.

Merit-Based Enhancement Fellowships for Current Graduate Assistants

To help departments reward outstanding graduate assistants, the Graduate School offers Merit-Based Enhancement Fellowships to graduate assistants who are engaged in the teaching or research mission of New Mexico State University. The amount of the award is \$4,000 for an academic year. Nominations must come from faculty.

Outstanding Graduate Assistantship Award

We also offer Outstanding Graduate Assistant awards of \$6,250 to recognize the contributions of eight (8) graduate assistants to the teaching and research mission of New Mexico State University. The awards allow faculty to show appreciation for the excellent work of graduate assistants. Current graduate assistants must be nominated by their faculty to be considered for the awards.

State of New Mexico Department of Higher Education (NMHED) Graduate Scholarship Programs

The purpose of the NMHED fellowships/assistantships is to "increase graduate enrollment in the state's public universities of students from groups underrepresented in graduate education" (Title 5 Post-Secondary Education, 5.7.15 NM Administrative Code). Underrepresented groups include women, minorities, the visually handicapped, the physically disabled and other groups that have are underrepresented in their field of study. Applicants must be U.S. citizens or permanent U.S. residents. Priority is given to New Mexico students from those groups with the most severe under-representation and students with the greatest financial need" (5.7.15.NMAC).

NMHED fellowships carry stipends of \$7,200 per annum and matched with half-time (10 hours per week) teaching assistantship provided by the student's department for a total award of \$15,800.

Eligibility:

- Fellowships are available for two years for master's students and four years for doctoral students.
- One of the NMHED fellowships is, when possible, designated for a McNair Scholar.
- Departments are required to: a) use their graduate assistantship budget to bring the amount of the award up to the current salary of a graduate assistant that is working 20 hours per week, and b) provide a 20-hour graduate assistantship to the student while they receive the NM Higher Education Department award.
- Eligible according to a standard needs analysis or financial aid officer's professional judgement.

For the student to establish financial need, students must complete a Free Application for Federal Student Aid (FAFSA) form available online in the Financial Aid Office. This form is not to be returned to the Graduate School. The results will be sent to the student and the Financial Aid Office. **Students must have a complete file and have been approved for**

financial aid to be considered for this fellowship. Preference will be given to those students that have a current FAFSA form on file at the NMSU Financial Aid office.

Click here (<https://gradschool.nmsu.edu/Current%20Students/Graduate%20Forms.html>) for the nomination process details.

Graduate Assistants Salaries and Tax Withholding Guidelines

Internal Revenue Service tax withholding guidelines require graduate students employed through NMSU to maintain at least 6 credits of course work during the fall and spring semesters and 3 credits of course work for summer sessions to be eligible for the student FICA tax exemption. Student employees who do not meet this requirement during any given pay period will be subject to Social Security taxes and Medicare taxes. Salaries for the three salary levels of graduate can be found here. (<https://hr.nmsu.edu/general-resources/toolkits1/grad-assistant.html>)

Level I (G1) - Applies to regularly enrolled students pursuing a master's degree. This level is also for a first year student seeking a doctoral degree who does not currently hold a master's degree. Once the doctoral student becomes a second year student and passes their qualifying exam, they can obtain support as a Level II (G2) student.

Level II (G2) - Applies to students pursuing the Education Specialist or Doctoral degree who have passed the qualifying exam or who have a master's degree in the same or cognate field and the recommendation of the head of their major department.

Level III (G3) - Applies to a doctoral student who has passed the comprehensive examination and has advanced to candidacy.

Graduate assistants employed at least ten hours per week will be given in-state tuition during the first 12 months of tenure if the Graduate School approves of the hiring process prior to census date (stated by the University Student Records Office as the third Friday of the semester each spring and fall semester).

If New Mexico resident status has not been established by the time of any reappointment, the graduate assistant may be subject to non-resident tuition rates.

Applications for state residency may be obtained in the University Student Records Office located in the Educational Services building.

Social Security Numbers in Student Records

As required by law, social security numbers are collected from prospective and current students who

1. plan to seek employment on campus or
2. wish to receive financial aid.

In addition, the university is mandated by federal tax regulations to provide tuition and fee payment information to the student and the Internal Revenue Service, so that applicable educational tax credits may be computed. The social security number will be necessary to submit this tax reporting. The social security number is a confidential record and is maintained as such by the university in accordance with the Family Educational Rights and Privacy Act.

In order to be employed by New Mexico State University all students must have obtained a social security number within eight weeks of being hired or risk losing their assistantship.

When an official social security number is issued to an international student, it is the student's responsibility to inform Human Resources or the University Student Records Office as soon as possible.

Hourly Work

Eligibility for student payroll requires that a graduate student

1. be admitted to the Graduate School as well as to a department,
2. maintain a minimum cumulative GPA of 3.0, and
3. be enrolled for at least 9 graded credits.

A student may not work more than 20 hours per week during the academic year. Students looking for current job postings should check with Career Services, Garcia Annex, Room 204; or visit <http://careerservices.nmsu.edu/> (<http://careerservices.nmsu.edu>).

Students not classified as residents of New Mexico but working at an hourly rate are not eligible to receive in-state tuition.

Contact Information

For more information, contact:

Graduate School, MSC 3-GS
New Mexico State University
PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-5746
<http://gradschool.nmsu.edu/> (<http://gradschool.nmsu.edu>)

Postdoctoral Fellowships

Those individuals who are exemplary scholars, who have recently been awarded a doctoral degree, but who wish to continue their education and research experience under the direction of a professor at New Mexico State University are classified as postdoctoral. The postdoctoral fellowship is a regular professional appointment normally for one or two years. Under no circumstances will an individual remain in this classification for more than three years.

Postdoctoral fellowships are advertised and applications are submitted to the hiring department in compliance with the guidelines for hiring professional staff, but without the requirement for a position description questionnaire. An "E-Hire" staffing authorization request must be submitted to the office of Human Resources by the hiring department. No offer of employment may be made until approval has been given by Human Resources. Persons classified as postdoctoral fellows pay Social Security and New Mexico State Educational Retirement.

A postdoctoral fellow has the following privileges:

- may take 6 credits in spring and fall semesters, 4 credits per summer session without tuition
- is eligible to purchase an employee parking permit
- is eligible for other employee benefits available to regular employees, including annual and sick leave, as well as health, dental, and life insurances
- may purchase athletic tickets, activity tickets, and gymnasium privileges
- is eligible for library privileges

The University recognizes and supports the concept of off-campus study and research as a valuable experience for graduate students. These experiences may take the form of internships, intensive study

of specialized techniques with personnel at other institutions, and conducting research at specialized research facilities. Arrangements for such off-campus activities should be made with the student's committee and the graduate dean and should represent opportunities not normally available at this university. When the bulk of a student's research is to be conducted off-campus, both on- and off-campus advisors should be appointed and periodic meetings with the student's committee held to ensure timely progress. Such opportunities offer students considerable flexibility in their training and promote valuable contacts between the student, the university, industry, and research institutions. Students are encouraged to pursue these opportunities with their advisors and the graduate dean.

Agricultural Experiment Station

The Agricultural Experiment Station is the research division of the College of Agricultural, Consumer and Environmental Sciences. Faculty, professional personnel, and graduate students conduct basic and applied research concerned with biological, physical, and economic phases of food and fiber production, processing, and distribution; consumer health and nutrition; and the social and economic aspects of rural living. Energy, environmental, and natural resource conservation aspects of these broad disciplines offer many opportunities for the graduate student to undertake meaningful research investigations in both the laboratory and the field.

There are eight departments on the main campus with excellent laboratory facilities for research. In addition, the station maintains 13 field research centers including eight agricultural science centers, a forestry research center, a livestock research center, an animal insect lab, and two research ranches.

The station provides financial support to graduate research assistants and cooperates with research institutes at the university and with various state and federal agencies in providing opportunities for graduate research programs covering a wide scope of student interests. For further information, contact aesdean@nmsu.edu or visit <http://aces.nmsu.edu/aes/>.

Apache Point Observatory (APO-ARC)

Apache Point Observatory (APO) is located in the mountains of south-central New Mexico and is operated by New Mexico State University. The observatory is a major astronomical research facility that is home to four telescopes. The largest is a fully equipped 3.5-meter telescope that can be used for optical and infrared imaging, photometry, and spectroscopy. Apache Point Observatory is also the site of the Sloan Digital Sky Survey 2.5-meter telescope, which is running several different wide-field surveys touching on many facets of astronomy. NMSU owns and operates a 1-meter telescope at APO for wide field imaging. There is also a 0.5-meter telescope at the site.

Apache Point Observatory is owned by the Astrophysical Research Consortium (ARC). The consortium members include: New Mexico State University, the University of Colorado, the University of Virginia, the University of Washington, Georgia State University and Johns Hopkins University. NMSU manages and operates the observatory for the ARC consortium. Astronomy faculty and graduate students use the facility for various research projects. For further information, e-mail astro@nmsu.edu.

Arts and Sciences Research Center

The research center is the coordinating office for all scholarly activities within the College of Arts and Sciences. The primary functions are service to departments and faculty members, and the administration of grants and contracts. The center encourages and stimulates individual research and creative efforts in all areas of the college, and it facilitates the development of potential research programs within the college, and with other colleges, institutes, the Physical Science Laboratory, and external organizations. The center assists individual faculty members by providing small grants of "seed" money. Typically, support services fall within, but are not limited to, the following areas:

- Location of funding sources
- Administration of grants and contracts
- Financial management of grants and contracts
- Liaison with the Office of the Vice President for Research

Contact: Lorenza Sanchez at lorenzsa@nmsu.edu
<https://artsci.nmsu.edu/research/contact-research-center.html>

Bioinformatics Research Lab

The bioinformatics research lab develops efficient computational and statistical methods to model mechanisms of complex biological systems. The lab's work rigorously evaluates both the theoretical and practical effectiveness of computational methods for characterizing molecular interactions from high-throughput measurements such as next generation sequencing data. The lab's long term goal is to invent advanced computational technology to expedite quantitative understanding of the complexity of life processes.

Director: Joe Song
<https://www.cs.nmsu.edu/~joemsong/group.shtml>

Biology Research Facilities

The Department of Biology houses multiple core facilities and individually faculty-maintained research laboratories that have been successful in the acquisition of millions of dollars in research grants from the NIH, NSF, and other agencies. The facilities and equipment include cell culture facilities, insect and invertebrate rearing and microbiology culturing facilities, next generation DNA sequencing instruments, wide-field and confocal microscopes as well as a well-maintained herbarium and vertebrate museum holding more than 100,000 specimens from our region and beyond. Individual research laboratories are equipped to employ a diverse array of molecular, physiologic, behavioral and computational tools to address research questions related to: organismal and microbial evolutionary mechanisms and physiology; vaccine development; host-symbiont interactions; cell and developmental biology; neuronal and muscular tissues; animal vocalization and behavior; computational modeling of biological phenomena; and molecular systematics.

Contact: Dr. Charles Shuster (cshuster@nmsu.edu)

Bureau of Business Research and Services

Founded in 1969, the bureau has two basic objectives. The first is to provide business and economic research services to both public and private sectors of the state, the region and the nation. Research capabilities in the behavioral and managerial sciences, business systems, economic and social sciences, marketing, statistical design and analysis

and regional planning can be applied to problems relating to economic growth, business development and community needs in New Mexico.

The second objective of the bureau is to provide management training services to business organizations and associations, to government agencies, and to the public as well. Management development seminars, training programs, and analytical services are designed to meet specific organizational needs.

The Bureau of Business Research and Services is a member of the Association for University Business and Economic Research.

<https://business.nmsu.edu/faculty-research/research-programs/centers/bbbs/bureau-of-business-research-and-service.html>

Carlsbad Environmental Monitoring and Research Center

Created in 1991 with a grant from the U.S. Department of Energy, the Carlsbad Environmental Monitoring & Research Center (CEMRC), a department of the College of Engineering, conducts environmental research, provides special analytical services, assists with technology development, and disseminates information for federal, state, and private sponsors. CEMRC is housed at Light Hall, a 26,000-square-foot facility located in Carlsbad, in southeast New Mexico. The facility's laboratories include radiochemistry and associated nuclear spectroscopy, environmental organic and inorganic chemistry, in vivo bioassay, and field sampling. A primary activity of CEMRC is long-term environmental monitoring for contaminants in the region of the Waste Isolation Pilot Plant (WIPP), located near Carlsbad. The data produced from this project are summarized in periodic reports and are presented on the CEMRC web site at www.cemrc.org. Primary research areas of the CEMRC include studies of atmospheric dust and inorganic contaminants, human and ecological risk assessment, and development of radioanalytical and spectroscopic methods for measurement of naturally occurring and human-produced radioactive elements. Results of CEMRC research projects appear in peer-reviewed scientific journals and are presented at national and international meetings.

Contact: Punam Thakur at 575-234-5531, pthakur@cemrc.org

The Center for Animal Health and Food Safety

The Center was founded in 2007 and is comprised of three primary functional research units:

1. Chemical Analysis and Instrumentation Laboratory maintains high-end analytical instrumentation which is available to support collaborative research within NMSU, the State of New Mexico and other educational or industrial partners.
2. Food Safety Microbiology Laboratory specializes in research and development of foodborne pathogen detection and control; food product testing, including microbiological analyses, pH, aw; process evaluation of acidified foods, inoculation studies, shelf-life testing, and contracting to establish food safety plans (e.g. HACCP plans, *Listeria* control programs).
3. Veterinary Entomology Research Laboratory provides a state-of-the-art large animal research facility located on 45 acres, with a 5000 sq. ft. large animal laboratory, capable of housing 24 animals individually in environmentally controlled rooms. The laboratory maintains multiple insect rearing facilities for major ectoparasites including: house flies, stable flies, horn flies, face flies, mosquitoes, lice, mites

and ticks. The facility has outdoor housing for 60 large animals in covered, individual outdoor stanchions, in addition to housing for wildlife species including: deer, elk, bighorn sheep and rabbits.

Director: **Dr. Brandon G. Smythe** (bsmythe@nmsu.edu) (575) 646-1111

Center for Latin American and Border Studies

The Center for Latin American and Border Studies (CLABS) was established in 1979 by the College of Arts and Sciences and is located at the Nason House. CLABS supports Frontera NorteSur, an on-line journal about the U.S.-Mexico border. In addition, CLABS supports the collection at the NMSU library, travel for faculty to conferences, language training in Spanish and Portuguese, lectures by visiting speakers, curriculum development for teachers, the student Latin American organization, and other outreach activities. It has a faculty governance organization and helps administer the Nason foundation fund. In recent years the center has pursued an active program of research on U.S.-Mexico border policy issues, in cooperation with several universities in the United States and Mexico.

Contact: Center for Latin American and Border Studies: <https://clabs.nmsu.edu> (<https://clabs.nmsu.edu/>)

Chemistry and Biochemistry Research Facilities

The Department of Chemistry and Biochemistry has a comprehensive equipment base that supports research in nearly all phases of chemistry. It also has instrumentation dedicated to the department's teaching mission. Major instruments supporting both missions include five nuclear magnetic resonance (NMR) spectrometers ranging from low field (200 MHz) to high field (500MHz), two atomic absorption spectrometers, several UV-Vis spectrometers, two mass spectrometers (LS/MS) and four gas chromatograph instruments. Details about all instruments located in the department's facilities can be accessed at <https://chemistry.nmsu.edu/research/research-facilities.html>

Contact Instrumentation Facilities: chembche@nmsu.edu ()

Cooperative Extension Service

As a land-grant institution, New Mexico State University has a tripartite mission—instruction, research, and extension. The three parts of this mission are closely interrelated and mutually reinforcing. New Mexico State University's Cooperative Extension Service serves a unique role in New Mexico. As the state's land-grant university, and as mandated by its charter, it is the "leading object" for agriculture, home economics, engineering, business, health sciences, as well as educational programs in the liberal arts and natural sciences. NMSU's uniqueness arises from its vision of teaching/learning, research, and extension/outreach functions—interdependent, mutually supportive and central to its land-grant mission.

The extension aspect of the university's mission is the process of extending the intellectual expertise and resources of the university through teaching and applied research to address the social, civic, economic and environmental challenges and opportunities facing our state, region, nation, and global community. Extension entails an organized and planned program of activities; these activities bring the resources of the university to bear in a coherent and strategic fashion for the benefit of the citizens of New Mexico and the nation. Many faculty

have split appointments with the Agricultural Experiment Station and serve as graduate advisors for students interested in extension as a career. For more information see <http://extension.nmsu.edu/>.

Core University Research Resources Laboratory

The Core University Research Resources Laboratory (CURRL) is a campus-wide, core facility providing all levels of technical support and consultation for investigators needing analytical and routine transmission, scanning electron microscopy, and light microscopy services. The integrated imaging facility is administered through the Office of the Vice President for Research and is considered a core research facility. The facility was established to furnish state-of-the-art microscopy instrumentation and techniques to investigators and their students for research and training.

Director: Dr. Tanner Schaub (tschaub@nmsu.edu)

<https://research.nmsu.edu/RCP.html>

Dissect Laboratory

DISSECT (Discovering Science through Computational Thinking) is a laboratory established by a joint team of researchers from the Department of Computer Science and the College of Education. The lab is housed in Computer Science on the second floor of the Science Hall. DISSECT provides physical space and facilities to nurture interactions between computational scientists and educational researchers in order to develop innovative technologies that will expose K-12 students to fundamental principles of computing. The laboratory provides workspaces and high-performance workstations for graduate students as well as a dedicated network and offices for researchers and visitors.

https://www.cs.nmsu.edu/gk12/?page_id=1186

Program Coordinator: Raena Cota gk12@cs.nmsu.edu

Engineering Research Center

The mission of the College of Engineering's Engineering Research Center (ERC) is to support the faculty and staff of the college in building research programs of nationally and internationally recognized excellence. The ERC assist faculty and staff in their pursuit of research funding, management of their research, and in ensuring research activities are in compliance with all relevant laws and regulations.

The ERC disseminates information to the college regarding state, national and international research trends, programs and policies. The ERC identifies potential funding opportunities and calls for proposals that may be a fit for college faculty and staff. The ERC works with the Office of the Vice President for Research and the other NMSU colleges to bring together multi-disciplinary teams.

Engineering Research Center for Bio-Mediated and Bio-Inspired Geotechnics (CBBG), Engineering Research Center for Re-inventing the Nation's Urban Water Infrastructure (ReNUWit), Tran-Set: Transportation Consortium of South-Central States, and iCREDITS: Interdisciplinary Center of Research Excellence in Design of Intelligent Technologies for Smart Grids.

For proposal preparation, the ERC pre-award team assists the faculty with interpretation of sponsor guidelines, development of the proposal budget, completion of standardized forms, review of the proposal for adherence to sponsor requirements, and submission to the NMSU

Office of Grants and Contracts for their review and final submission. The post-award staff assist the faculty and staff with award management, including working with the NMSU Sponsored Projects Accounting office. The ERC is responsible for financial management of college grants and contracts. <https://enr.nmsu.edu/Research/page-five.html>

Contact: Dr. Phillip DeLeon (pdeleon@nmsu.edu)

Freeport-McMoran Copper & Gold Water Quality Laboratory

The Water Quality Laboratory in the College of Engineering was established by a gift from Freeport-McMoRan. It is located in ECIII rooms 106 and 110. Current capabilities of the lab include:

- Dionex ICS-2100 Ion Chromatographic System (ICS) with an AS-DV autosampler, the ICS-2100 is configurable for either anions or cations;
- PerkinElmer Elan DRC-e Inductively Coupled Plasma for Mass Spectrometry (ICP/MS) with dynamic reaction cell (DRC) capability;
- Perkin Elmer Series 200 High-Performance Liquid Chromatography (HPLC) with UV/Vis Detection;
- Gas Chromatography (Agilent model 7890) using a mass spectrometer detector (Agilent model 5975C) (GC/MS) using an Agilent 7693 autosampler;
- A 16-vessel Multiwave 3000 Microwave Reaction System by Anton Paar;
- Micromeritics ASAP 2050 High Pressure Sorption Analyser that uses a dewar with liquid nitrogen or antifreeze for temperature control. The antifreeze temperature is controlled from -20° to +75° Celsius using a PolyScience PD15R-30 recirculator bath;
- Shimadzu TOC-Vcsh Total Organic Carbon Analyser (TOC) with a Total Nitrogen Measurement Unit (TNM-1) option;
- Malvern Zetasizer Nano ZS for zeta potential and size measurement of suspended particles;
- Anton Paar Surpass for zeta potential measurement of membranes, granules, or fiber particles; and
- a Millipore Direct Q3 water purification system.

Analyses may be performed by a researcher after receiving training on the device.

Contact: Dr. Phillip DeLeon, pdeleon@nmsu.edu, <https://wordpress.nmsu.edu/mchidest/>

Geochemistry Research Laboratory

The Department of Geological Sciences houses a number of analytical instruments, all of which are available for use by graduate students, undergraduate researchers, and faculty. The department houses a Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometer (LA-MC-ICPMS) for analysis of isotopic ratios of microsamples, an X-ray fluorescence spectrometer for geochemical analysis of rocks and other solid materials, a thermal ionization mass spectrometer for analysis of isotopic ratios of solids and liquids, and a laser-induced breakdown spectrometer for the analysis of solid materials. Sample preparation equipment is available to support research on these instruments. In addition, mineral separation equipment including a jaw crusher, Gemini shaker table, Franz magnetic separator, and heavy liquids, is available for geochronologic or other mineralogic research projects.

Contact: Dr. Nancy McMillan (nmcmilla@nmsu.edu)

ICredits: Interdisciplinary Center of Research Excellence in Design of Intelligent Smartgrids Technologies

The Center, funded through a grant from the National Science Foundation, is focused on the development of novel hardware/software technologies and methodologies to enable the design, development, deployment and evaluation of microgrids and smartgrids. The Center is housed in Science Hall; it supports research activities at the boundaries between power systems and computer science. The Center also promotes the development of educational and outreach activities aimed at enhancing the awareness and training in all areas relevant to the smartgrids vision.

Contact: Dr. Enrico Pontelli (epontell@nmsu.edu)

Institute for Energy and the Environment

The Institute for Energy & the Environment (IEE) is a unit within the Engineering Research Center IEE's programmatic efforts focus on interdisciplinary research, education, and outreach to develop comprehensive solutions for environmental, energy and water challenges in the southwestern United States and worldwide. IEE offers opportunity for conducting research to the graduate and undergraduate students at NMSU. IEE's major objectives include renewable energy, biofuel, advanced water treatment and desalination, and advancing education, training and outreach in areas of environment, energy and water.

Director: Dr. Phillip DeLeon (pdeleon@nmsu.edu)

Knowledge Discovery and Data Mining (KDD) Research Lab

The Knowledge Discovery and Data Mining (KDD) research lab aims at advancing techniques for the effective management and analysis of complex data (e.g., sequence data, graph data, semi-structured data). The laboratory conducts research in modeling, storing, querying, and mining large amount of complex data at both theory and application levels. The laboratory keeps active collaborations with scientists from other Computer Science areas and scientific disciplines to broaden the usage of data management and data mining techniques. The laboratory is located in Science Hall, Rm. 153.

Director: Huiping Cao

Knowledge Representation, Logic and Advanced Programming Laboratory (KLAP)

The KLAP lab was established in 1994 through an RIMI grant from the National Science Foundation and has developed into a focal research laboratory of international reputation. It is housed in the Department of Computer Science. KLAP's research focus is to advance state-of-the-art knowledge in Artificial Intelligence and High Performance Computing and its application in diverse interdisciplinary domains such as bioinformatics and assistive technologies.

The lab provides a full meeting space (with multimedia projection capabilities), access to eight high performance work stations, a dedicated high performance computing server and a 40-core Infiniband Beowulf cluster. The lab has hosted international researchers and has graduated approximately 100 graduate students with MS and Ph.D.

degrees. It has attracted almost \$10,000,000 in external funding. <https://www.cs.nmsu.edu/klap/>

Director: Dr. Enrico Pontelli (epontell@cs.nmsu.edu)

Networks and Systems Optimization Lab (NSOL)

The Networks and Systems Optimization Laboratory (NSOL) supports research in networking and communication including, but not limited to: wireless networks, the Internet, supercomputing networks, and online social networks. This research includes optimization problems, protocol design and development, hardware design and development, and mechanisms for improving security and privacy of communications (including cybersecurity). The lab has a 24 core blade server (RAID-10) that is used for extended simulations and back-up, five desktops, five laptops, and four smartphones, which form a networking testbed.

Director: Satyajayant "Jay" Misra

<https://computerscience.nmsu.edu/research/groups-labs.html>

New Mexico Department of Agriculture

The New Mexico Department of Agriculture (NMDA), under the control of the NMSU Board of Regents, is responsible for administering laws and regulations that daily affect the lives of every citizen of the state. These laws and regulations (concerning the production, preparation, processing, sale, and use of agricultural products; weights and measures; and petroleum products) are designed to assist producers, processors, and consumers. NMDA's marketing program provides guidance to commodity groups in the promotion of agricultural products. A broad consumer service in many areas other than agriculture is provided by the department. NMDA's director is New Mexico's secretary of agriculture and serves on the governor's cabinet as a liaison between state government and the agricultural industry. For further information, e-mail: pio@nmda.nmsu.edu. NMDA's web site is at <http://www.nmda.nmsu.edu>

New Mexico State University Library

The New Mexico State University Library is a Destination for Discovery that offers access to rich content and research-level collections in two library facilities located in the heart of the campus. Zuhl and Branson libraries house over 1.8 million items and provide electronic access to scholarly journals and databases for both general academic and discipline-specific research. View the large geological collection and artworks on display at Zuhl Library and explore historical collections within the Archives and Special Collections Department at Branson Library. Reference assistance and research support are provided by a team of faculty and staff dedicated to student learning and success. There are a variety of study areas available including quiet and group spaces, some of which can be reserved. Over 100 PCs, scanners, laptops, and other resources are available for students to use. More detailed information may be found at <http://lib.nmsu.edu>.

New Mexico Water Resources Research Institute

The New Mexico Water Resources Research Institute (WRRI) at NMSU, established in 1963, was one of the first of 54 water institutes in the United States. The WRRI program encompasses all state universities in New Mexico and public agencies sponsoring water research. The institute serves as a coordinator, assisting researchers in obtaining

funds, working with granting agencies, and serving as the administrator for projects. The annual budget of approximately \$1.5 million is made available from federal, state, and/or private sources through a variety of grants and contracts. All research projects administered by the institute encourage graduate student participation. As a result, about 30 students a year receive scientific training through institute-sponsored projects. WRRRI also sponsors the Annual New Mexico Water Conference, which has provided a public forum for state water issues since 1956. Public participation helps the institute focus its research program on areas of greatest need. The WRRRI publishes research results of every project it administers and other miscellaneous reports. The WRRRI also maintains a water resources reference room with 2,000 books and documents and the ability to link to 10,000 water-related documents on water issues facing the state and the nation. E-mail may be sent to nmwrrri@nmsu.edu. The WRRRI's homepage address is <http://nmwrrri.nmsu.edu/>.

Oak Ridge Associated Universities Program (ORAU)

Since 1991, students and faculty of New Mexico State University benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 98 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOA facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at <http://www.ornl.gov>, or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact:

Dr. Luis Cifuentes - Vice President for Research (575) 646-2481

ORAU Corporate Secretary (865) 576-3306; or Visit the ORAU Home Page (<http://www.ornl.gov>)

Physics Research Facilities

The Department of Physics operates a PANalytical Empyrean x-ray diffractometer for low-resolution powder diffraction, high-resolution

diffraction, reciprocal space mapping with a triple-axis crystal, and x-ray reflectance. It also operates a J.A. Woollam variable angle of incidence ellipsometer (VASE) with a computer-controlled Berek waveplate compensator for measurements from 190 to 2500 nm, at room temperature and from 80 to 800 K. Both instruments are integrated into CURRL and available to the campus community and off-campus users for a fee. See <https://phys.nmsu.edu/research/research-programs.html> for more information.

Contact Dr. Stefan Zollner (zollner@nmsu.edu).

Play and Interactive Experiences for Learning Lab (PIXL)

The Play and Interactive Experiences for Learning (PIXL) Lab works at the intersection of games, human-computer interaction, and mixed reality, developing game experiences that educate and function as scientific experiments in HCI. Projects center around the best means of interfacing with games, including keyboard and mouse and controllers all the way to gesture-based input, wearable systems and mixed reality. Prior research has investigated the use of games for training firefighters, and ongoing research applies this to disaster response in general and military projects. The lab provides space for students, as well as access to workstations, a modular wearable computer, tracking sensors and games.

Director: Zachary O. Toups (ztoups@nmsu.edu)

Programming Languages Environments and Software Engineering (PLEASE) Laboratory

The PLEASE lab pursues research in the practical aspects of software development, including programming languages, programming environments, and software engineering. The lab is housed in Science Hall 167 and includes workstations and work space for graduate students pursuing research in relevant areas.

Director: Jonathan Cook
<http://www.cs.nmsu.edu/please>

Psychology Research Facilities

The Department of Psychology emphasizes research in social psychology, engineering psychology, and cognitive psychology. Faculty investigate such issues as mother-infant interactions and the impact of cortisol responses to stress upon development; visual search; human factors research; auditory perception; prospective memory; emotion and social decision-making; evolutionary psychology; skill acquisition; social cognition; perception and action; embodied cognition; cognitive neuroscience (control of attention, neural dynamics; and brain-computer interfaces); and research and statistical analysis methods.

All faculty have designated labs with a large central area and 3-4 smaller adjacent rooms. This facilitates data collection from small groups or individuals. Research using the department's subject pool is managed with an online system.

The department has specialist facilities that include an EyeLink 1000 eye tracking system with experiment builder software; two 128 channel Biosemi ActiView-2 EEG systems and two shielded rooms; eight analysis workstations; and a Neuroconn DC Stimulator Plus tDCS stimulator. The lab collaborates with the Mind Research Network that has access

to a Siemens 3T Trio research MR scanner, a Magvis 132 channel MEG system, and Biosemi and Geodysics EEG systems. The Auditory Perception Lab has a remote-controlled robot with binocular vision and stereo audition that is used to assess auditory performances in applied settings; another remote controlled robot to test perceptual interfaces for remotely-operated vehicles; a 30-element speaker array to simulate real-world auditory environments; and two portable eye trackers housed in the PACMANE (Perception, Action and Cognition in Mediated, Artificial and Naturalistic Environments) lab.

For more information: <https://psychology.nmsu.edu/pages/subpages/fac-research.html>

Research Initiatives in the College of Education

The College of Education has research initiatives and labs in the following areas:

- The Kinesiology and Dance Department offers lab space for the study of biomechanics, sport psychology & motor learning, applied and basic physiology, healthy aging, physical education curriculum and kinesthetic learning.
- The Speech and Hearing Center's Benfer for voice and speech science research.
- The Special Education/Communication Disorders Department's Autism Research Initiative.
- Alliance for the Advancement of Teaching and Learning in collaboration with the Southwest Regional Educational Lab REL (Institute for Educational Services, IES) provides research for partner school district practitioners on accountability, special education/response to intervention, literacy, leadership development, math and science achievement, and program evaluation.
- The Institute for Mathematics and Science Education oversees multiple mathematics and science grants as well as serving as the STEM Outreach Center for K-12 education.
- The Counseling and School Psychology Training and Research Center provides counseling services for students, training for graduate students in counseling, school psychology and counseling psychology, and conducts research on counseling outcomes and processes.
- A Reading Research Center is housed in the NMSU Children's Village and provides reading diagnostic services including analysis of reading using eye-tracking software.

Southwest Institute for Health Disparities Research

To address the substantial health disparities that exist in Southern New Mexico and the U.S./Mexican Border Region, New Mexico State University has recently established the Southwest Institute for Health Disparities Research within the College of Health and Social Services. The purpose of the Institute is to assist faculty to secure external funding and conduct research which has the potential to reduce health disparities and improve minority health, provide health related community outreach programming, provide training for researchers, lay groundwork for additional funded research, and attract highly qualified minority faculty and graduate students to NMSU.

<https://swihdr.nmsu.edu> (<https://swihdr.nmsu.edu/>)

Dr. Jill McDonald (jillmcd@nmsu.edu)

Southwest Technology Development Institute (SWTDI)

SWTDI, formally the SouthWest Regional Experimental Station or SWRES, was established in 1977 under DOE funding as a Photovoltaic research center. Over the last 30 years SWTDI has conducted extensive long term panel, inverter, and systems testing providing significant contribution to the field. One substantial consequence of the system testing has been the accumulation of knowledge related to the safety, installation methodology, design, and development industry standards in PV. Today SWTDI continues to be a leader in education and development of article 690 of the National Electric Code (NEC), Solar Photovoltaic Systems and continues its research in long term panel and inverter testing. However in 2012 SWTDI integrated with the Electrical and Computer Engineering Department of NMSU to broaden the research focus and has developed a microgrid for expanded research into renewable integration into the electric grid and demonstration of ongoing collaborative research with the ECE department on industry partners.

<https://ece.nmsu.edu> (<https://ece.nmsu.edu/>)

Spatial Applications and Research Center (SPARC)

The SpARC laboratory was established in 1982 as an applied contract research laboratory for the NMSU Geography Department. SpARC provides a variety of services including planning and research, GIS, image processing, modeling and training. The original purpose of the laboratory was to undertake externally funded projects under the direction of geography faculty and employ students within the department. Thirty-four years later, the laboratory continues to do project related work. It has employed more than 150 students, and provided assistance to more than 35 faculty members inside and outside Geography. The primary clients of the lab have been federal state and local government agencies, with an emphasis on applied transportation, water resource, and environmental research projects. The lab houses 11 high performance workstations, a range of mapping grade GPS units, and a large scanner/plotter. Software available for use includes database software, ENVI image processing software, TransCAD, and the entire suite of Esri GIS software. http://smiley.nmsu.edu/SparcWebsite/BGIS2Index_2012.html

Director: Dr. Christopher Brown (brownchr@nmsu.edu; (575) 646-1892)

Crimson Research

Crimson Research is designed to assist researchers, agency directors, business leaders, and policy makers in all aspects of survey research and program evaluation. Housed in the College of Health, Education and Social Transformation, the Center has state-of-the-art hardware and software for conducting phone and internet surveys of any type and length as well as facilities for conducting face-to-face interviews and focus groups. Crimson Research provides a wide array of services: questionnaire design, sampling, data collection, and statistical analysis for telephone, mail, and internet surveys. Center staff are also able to assist and conduct all forms of program evaluation from formative to summative approaches, including process, outcome and impact evaluations. Bilingual (Spanish/English) questionnaire translation and interviewing are also available. https://publichealth.nmsu.edu/research_and_outreach/crimson_research.html

Director: Dr. Joe Tomaka (tomaka@nmsu.edu; (575) 646-3525)

University Museum

Established in 1959, the New Mexico State University Museum has provided 50 years of service to the university and community. The University Museum assists NMSU in providing quality education, advancing knowledge through research, and celebrating the culture and history of the southwest and the University. The Museum serves the community as a repository and exhibitor of local and regional history and culture. Through its care and maintenance of donated ethnographic, historic and prehistoric objects, it preserves an important part of Southwestern and Border region culture and history. The Museum encourages faculty and student research using our diverse cultural materials.

The Museum's collections are primarily anthropological (archaeological and ethnographic) with secondary collections in history and the natural sciences. Anthropological collections document the cultural diversity of the border in the Greater Southwest and northern Mexico. The Museum preserves and catalogs collections to promote research and access to cultural materials. Exhibits are developed by students and staff as well as brought in from other institutions.

<https://univmuseum.nmsu.edu> (<https://univmuseum.nmsu.edu/>)

Director: Dr. Fumi Arakawa (farakawa@nmsu.edu)

Curator: Dr. Kristin Otto, krotto@nmsu.edu

Masters Degrees

A

- Accounting - Master of Accountancy (p. 89)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 90)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/aerospace-engineering-meae-online/>)
- Aerospace Engineering - Master of Science (p. 90)
- Agricultural and Extension Education (Agricultural Strategic Communications) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agricultural-extension-education-agricultural-strategic-comm-ma-online/>)
- Agricultural and Extension Education - Master of Arts (p. 93)
- Agricultural and Extension Education - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agricultural-extension-education-ma-online/>)
- Agricultural Biology - Master of Science (p. 93)
- Agricultural Economics - Master of Science (p. 94)
- Agriculture (Agribusiness) - Master of Agriculture (p. 91)
- Agriculture (Agribusiness) - Master of Agriculture (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agriculture-agribusiness-mag-online/>)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 92)
- Animal Science - Master of Science (p. 96)
- Anthropology - Master of Arts (p. 97)
- Applied Statistics - Master of Science (p. 99)
- Art - Master of Arts (p. 100)

- Astronomy - Master of Science (p. 100)
- Athletic Training - Master of Science (p. 95)

B

- Bioinformatics - Master of Science (p. 104)
- Biology - Master of Science (p. 105)
- Business Administration (Agribusiness) - Master of Business Administration (p. 108)
- Business Administration (Finance) - Master of Business Administration (p. 110)
- Business Administration (Health Services Management) - Master of Business Administration (p. 111)
- Business Administration (Health Services Management) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-health-services-mgt-mba-online/>)
- Business Administration (Information Systems) - Master of Business Administration (p. 113)
- Business Administration (Information Systems) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-information-systems-mba-online/>)
- Business Administration (Public Utility Regulations) - Master of Business Administration (p. 114)
- Business Administration (Public Utility Regulations) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-public-utility-regulations-mba-online/>)
- Business Administration - Master of Business Administration (p. 106)
- Business Administration - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-mba-online/>)

C

- Chemical Engineering - Master of Science in Chemical Engineering (p. 116)
- Chemical Process Industry - Master of Engineering in Chemical Process Industry (p. 116)
- Chemical Process Industry - Master of Engineering in Chemical Process Industry (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/chemical-process-industry-mecpi-online/>)
- Chemistry - Master of Science (p. 117)
- Civil Engineering - Master of Engineering in Civil Engineering (p. 118)
- Civil Engineering - Master of Engineering in Civil Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/civil-engineering-mece-online/>)
- Civil Engineering - Master of Science in Civil Engineering (p. 119)
- Clinical Mental Health Counseling - Master of Arts (p. 121)
- Clinical Psychopharmacology - (Postdoctoral) - Master of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/clinical-psychopharmacology-postdoctoral-ms-online/>)
- Communication Disorders - Master of Arts (p. 122)
- Communication Studies (Analysis and Decision-Making) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-studies-analysis-decision-making-ma-online/>)

- Communication Studies (Leadership Communication) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-studies-leadership-communication-ma-online/>)
- Communication Studies - Master of Arts (p. 123)
- Computer Science - Master of Science (p. 124)
- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 125)
- Creative Writing - Master of Fine Arts (p. 125)
- Criminal Justice - Master of Criminal Justice (p. 125)
- Criminal Justice - Master of Criminal Justice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/criminal-justice-mcj-online/>)

D

- Data Analytics (Digital Agriculture) - Master of Data Analytics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/data-analytics-digital-agriculture-mda-online/>)
- Data Analytics - Master of Data Analytics (p. 126)
- Data Analytics - Master of Data Analytics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/data-analytics-mda-online/>)

E

- Economics (Econometrics) - Master of Arts (p. 128)
- Economics (Econometrics) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-econometrics-ma-online/>)
- Economics (Public Policy) - Master of Arts (p. 128)
- Economics (Public Policy) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-public-policy-ma-online/>)
- Economics (Public Utility Policy and Regulation) - Master of Arts (p. 129)
- Economics (Public Utility Policy and Regulation) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-public-utility-policy-regulation-ma-online/>)
- Economics - Master of Arts (p. 127)
- Economics - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-ma-online/>)
- Education (Bilingual Education) - Master of Arts (p. 129)
- Education (Curriculum & Instruction) - Master of Arts (p. 130)
- Education (Curriculum & Instruction) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-curriculum-instruction-ma-online/>)
- Education (Early Childhood Education Plus Licensure) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-early-childhood-ed-plus-licensure-ma-online/>)
- Education (Early Childhood Education Plus Licensure) - Masters of Arts (p. 131)
- Education (Early Childhood Education) - Master of Arts (p. 130)
- Education (Early Childhood Education) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-early-childhood-ed-ma-online/>)
- Education (Educational Learning Technologies) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-educational-learning-technologies-ma-online/>)
- Education (Elementary Licensure Prep) - Master of Arts (p. 131)

- Education (Elementary Licensure Prep) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-elementary-licensure-prep-ma-online/>)
- Education (Elementary Mathematics and Science) - Master of Arts (p. 132)
- Education (Language, Literacy & Culture) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-language-literacy-culture-ma-online/>)
- Education (Language, Literacy, & Culture) - Master of Arts (p. 133)
- Education (Secondary Licensure Prep) - Master of Arts (p. 133)
- Education (Secondary Licensure Prep) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-secondary-licensure-prep-ma-online/>)
- Education (Spanish) - Master of Arts in Teaching (p. 135)
- Education (Teaching English to Speakers of Other Languages) - Master of Arts (p. 135)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (p. 136)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (p. 136)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/educational-leadership-administration-higher-ed-admin-ma-online/>)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/educational-leadership-administration-pk12-admin-ma-online/>)
- Electrical Engineering - Master of Engineering in Electrical Engineering (p. 137)
- Electrical Engineering - Master of Engineering in Electrical Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/electrical-engineering-meee-online/>)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 139)
- Electrical Engineering - Master of Science in Electrical Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/electrical-engineering-msee-online/>)
- English (Technical and Professional Communication) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/english-technical-professional-communication-ma-online/>)
- English - Master of Arts (p. 141)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 143)
- Experimental Psychology - Master of Arts (p. 144)

F

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)
- Fine Arts - Master of Fine Arts (p. 147)
- Fish, Wildlife and Conservation Ecology - Master of Science (p. 148)

G

- Geography - Master of Applied Geography (p. 149)
- Geology - Master of Science (p. 149)
- Government - Master of Arts (p. 149)

H

- History (Public History) - Master of Arts (p. 150)
- History - Master of Arts (p. 150)
- Horticulture - Master of Science (p. 151)

I

- Industrial Engineering - Master of Engineering in Industrial Engineering (p. 151)
- Industrial Engineering - Master of Engineering in Industrial Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/industrial-engineering-meie-online/>)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 152)
- Industrial Engineering - Master of Science in Industrial Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/industrial-engineering-msie-online/>)
- Information Technology - Master of Information Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/information-technology-mit-online/>)

M

- Master of Public Health/Master of Social Work - Dual Degree (<http://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/>)
- Mathematics - Master of Science (p. 154)
- Mechanical Engineering - Master of Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/mechanical-engineering-meme-online/>)
- Mechanical Engineering - Master of Engineering in Mechanical Engineering (p. 155)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 156)
- Molecular Biology - Master of Science (p. 156)
- MPA-MCJ Program - Dual Degree (p. 157)
- Music (Conducting) - Master of Music (p. 157)
- Music (Music Education) - Master of Music (p. 157)
- Music (Music Education) - Master of Music (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/music-music-education-mm-online/>)
- Music (Performance) - Master of Music (p. 158)

N

- Nursing Leadership and Administration - Master of Science in Nursing (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-leadership-administration-msn-online/>)

P

- Physics (Space Physics) - Master of Science (p. 158)
- Physics - Master of Science (p. 158)
- Plant and Environmental Science - Master of Science (p. 158)

- Public Administration - Master of Public Administration (p. 159)
- Public Health (Health Behavior & Health Promotion) - Master of Public Health (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-health-behavior-health-promotion-mph-online/>)
- Public Health (Health Behavior and Health Promotion) - Master of Public Health (p. 159)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (p. 161)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-health-mgt-admin-policy-mph-online/>)
- Public History and Public Administration - Dual M.A. Degree (p. 163)

R

- Range Science - Master of Science (p. 163)

S

- Social Work - Master of Social Work (p. 163)
- Social Work - Master of Social Work (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/social-work-msw-online/>)
- Sociology - Master of Arts (p. 164)
- Sociology - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/sociology-ma-online/>)
- Spanish - Master of Arts (p. 166)
- Spanish - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/spanish-ma-online/>)
- Special Education - Master of Arts (p. 167)
- Special Education - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/special-education-ma-online/>)

W

- Water Science and Management (Agricultural Water Resources) - Master of Science (p. 169)
- Water Science and Management (International Water Resilience) - Master of Science (p. 170)
- Water Science and Management (Water Economics and Policy) - Master of Science (p. 170)
- Water Science and Management (Water Informatics) - Master of Science (p. 171)
- Water Science and Management (Water Quality and Treatment) - Master of Science (p. 172)
- Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science (p. 172)
- Water Science and Management - Master of Science (p. 168)

Advanced Manufacturing - Concentration

The graduate concentration in advanced manufacturing educates students and creates a skilled workforce for the growing needs of new technologies and advanced products in the 21st century. The program provides hands-on experience on designing, adapting, and building parts using advanced materials by including new processes, changing the supply chain, and adapting business models. It also includes the design optimization, materials selection and characterization, process parameter mapping, data analytics, software development, and final part inspection

among other concepts. This concentration is maintained by the College of Engineering but is open to any Master's level major/degree.

Prefix	Title	Credits
Required Courses		
I E 575	Advanced Manufacturing Processes	3
I E 571	Advanced Quality Control	3
C E 510	Introduction to Nondestructive Testing	3
CHME 564	Polymer Science & Engineering	3
CHME 491/AGRO 450	Undergraduate Special Topics (AGRO 450 CHME 491 Development of Agricultural Technologies)	3
Electives		
5 Electives (Select 500 Level Courses from EE, CHME, IE, CE, or MAE) ¹		15
Total Credits		30

¹ With Approval of the advisor and instructor

Selection of Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

Although there is no oral exam, students will be required to complete an exit-interview with one of Advanced Manufacturing concentration and one graduate faculty member from the master of engineering they select to study.

Doctoral Degrees

A

- Aerospace Engineering - Doctor of Philosophy (p. 173)
- Animal Science - Doctor of Philosophy (p. 174)
- Applied Statistics - Doctor of Philosophy (p. 174)
- Astronomy - Doctor of Philosophy (p. 175)

B

- Biology - Doctor of Philosophy (p. 179)
- Business Administration (Management) - Doctor of Philosophy (p. 180)
- Business Administration (Marketing) - Doctor of Philosophy (p. 180)

C

- Chemistry - Doctor of Philosophy (p. 180)
- Computer Science - Doctor of Philosophy (p. 181)
- Counseling Psychology - Doctor of Philosophy (p. 181)
- Curriculum and Instruction - Doctor of Philosophy (p. 182)
- Curriculum and Instruction - Doctor of Philosophy (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/curriculum-instruction-phd-online/>)

E

- Economic Development - Doctor of Economic Development (p. 183)
- Educational Leadership & Administration (Higher Education Administration) - Doctor of Education (p. 184)
- Educational Leadership & Administration (Higher Education) - Doctor of Philosophy (p. 185)
- Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education (p. 186)
- Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy (p. 186)
- Engineering (Chemical Engineering) - Doctor of Philosophy (p. 187)
- Engineering (Civil Engineering) - Doctor of Philosophy (p. 188)
- Engineering (Electrical Engineering) - Doctor of Philosophy (p. 188)
- Engineering (Industrial Engineering) - Doctor of Philosophy (p. 190)
- Engineering (Mechanical Engineering) - Doctor of Philosophy (p. 191)
- Experimental Psychology - Doctor of Philosophy (p. 192)

G

- Geography - Doctor of Philosophy (p. 192)

H

- Health Equity Sciences - Doctor of Philosophy (p. 193)

K

- Kinesiology - Doctor of Philosophy (p. 194)

M

- Mathematics - Doctor of Philosophy (p. 195)
- Molecular Biology - Doctor of Philosophy (p. 196)

N

- Nursing Practice (Family Nurse Practitioner) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-family-nurse-practitioner-dnp-online/>)
- Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice (p. 196)
- Nursing Practice (Population Health Leadership) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-population-health-leadership-dnp-online/>)
- Nursing Practice (Psychiatric/Mental Health) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-psychiatric-mental-health-dnp-online/>)
- Nursing Practice - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-dnp-online/>)

P

- Physics - Doctor of Philosophy (p. 198)
- Plant and Environmental Science - Doctor of Philosophy (p. 198)

R

- Range Science - Doctor of Philosophy (p. 198)
- Rhetoric and Professional Communication - Doctor of Philosophy (p. 199)

S

- School Psychology - Doctor of Philosophy (p. 200)

W

- Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy (p. 201)
- Water Science and Management (International Water Resilience) - Doctor of Philosophy (p. 201)
- Water Science and Management (Water Economics and Policy) - Doctor of Philosophy (p. 202)
- Water Science and Management (Water Informatics) - Doctor of Philosophy (p. 202)
- Water Science and Management (Water Quality Treatments) - Doctor of Philosophy (p. 203)
- Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy (p. 203)
- Water Science and Management - Doctor of Philosophy (p. 200)

Graduate Certificates

- Autism and Spectrum Disorders - Graduate Certificate (p. 204)
- Autism and Spectrum Disorders - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/autism-spectrum-disorders-gr-certificate-online/>)
- Bilingual Education - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/bilingual-education-gr-certificate-online/>)
- Borderlands and Ethnic Studies - Graduate Certificate (p. 204)
- Cultural Resource Management - Graduate Certificate (p. 205)
- Digital Communications - Graduate Certificate (p. 206)
- Digital Signal Processing - Graduate Certificate (p. 206)
- Early Childhood Alternative Licensure - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/early-childhood-alt-licensure-gr-cert-online/>)
- Electric Energy Systems - Graduate Certificate (p. 206)
- Elementary Education Alternative Licensure - Graduate Certificate (p. 207)
- Family Nurse Practitioner - Post-Masters Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/family-nurse-practitioner-pm-certificate-online/>)
- Finance - Graduate Certificate (p. 207)
- Museum Studies - Graduate Certificate (p. 207)
- Online Teaching and Learning - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/online-teaching-learning-gr-certificate-online/>)
- Principal Licensure - Graduate Certificate (p. 208)
- Psychiatric/Mental Health Nurse Practitioner - Post-Masters Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/psychiatric-mental-health-nurse-practitioner-pmc-online/>)
- Public Health - Graduate Certificate (p. 208)
- Public Health - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-gr-certificate-online/>)
- Public Utility Regulation and Economics - Graduate Certificate (p. 209)

- Public Utility Regulation and Economics - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-utility-regulation-economics-gr-certificate-online/>)
- Secondary Education Alternative Licensure - Graduate Certificate (p. 209)
- Special Education Alternative Licensure - Graduate Certificate (p. 210)
- Sustainability - Graduate Certificate (p. 210)
- Systems Engineering - Graduate Certificate (p. 211)
- Systems Engineering - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/systems-engineering-gr-certificate-online/>)
- Teaching English to Speakers of Other Languages - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/tesol-gr-certificate-online/>)
- Telemetry - Graduate Certificate (p. 211)

Graduate Minors

- Advanced Manufacturing - Graduate Minor (p. 212)
- Agricultural and Extension Education - Graduate Minor (p. 212)
- Animal Science - Graduate Minor (p. 212)
- Anthropology - Graduate Minor (p. 212)
- Applied Statistics - Graduate Minor (p. 212)
- Archaeology - Graduate Minor (p. 212)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 213)
- Communication Studies - Graduate Minor (p. 213)
- Computer Science - Graduate Minor (p. 213)
- Economics - Graduate Minor (p. 213)
- Educational Administration (Doctoral) - Graduate Minor (p. 213)
- Educational Administration (Higher Ed.) - Graduate Minor (p. 213)
- Educational Administration (Pk-12) - Graduate Minor (p. 213)
- Fish, Wildlife and Conservation Ecology - Graduate Minor (p. 214)
- Food Studies - Graduate Minor (p. 214)
- Gender and Sexuality Studies - Graduate Minor (p. 214)
- Geographic Information Systems - Graduate Minor (p. 215)
- Gerontology - Graduate Minor (p. 215)
- History - Graduate Minor (p. 215)
- Information Systems - Graduate Minor (p. 215)
- Integrated Behavioral Health Care - Graduate Minor (p. 216)
- Materials Engineering - Graduate Minor (p. 217)
- Molecular Biology - Graduate Minor (p. 217)
- Native American Studies - Graduate Minor (p. 217)
- Physics - Graduate Minor (p. 218)
- Psychology - Graduate Minor (p. 218)
- Range Science - Graduate Minor (p. 218)
- School Psychology - Specialist in Education (p. 204)
- Security Studies - Graduate Minor (p. 218)
- Sociology - Graduate Minor (p. 218)
- Spanish Counseling - Graduate Minor (p. 218)
- Special Education - Graduate Minor (p. 220)
- U.S.-Mexico Border Health Issues - Graduate Minor (p. 220)

Accounting - Master of Accountancy

The Master of Accountancy program (MAcc) is recommended for students wishing to fulfill the Certified Public Accountant (CPA) 150-hour education requirement which most states, including New Mexico, have adopted.

Admission Requirements

Admission requirements of the NMSU Graduate School must be met before the applicant may be admitted to the MAcc program.

Consideration for admission to the MAcc program is dependent on an applicant's undergraduate record. The Graduate Management Admissions Test (GMAT) is also required, unless the student meets one of the GMAT waiver conditions listed below:

1. The student graduated with an undergraduate degree in accounting from a US AACSB accredited business school with at least a 3.25 GPA overall and a 3.25 GPA in their upper division accounting courses; or
2. The student is a graduate of NMSU's undergraduate accounting program with at least a 3.25 GPA overall and a 3.0 GPA in core upper division accounting classes; or
3. The student holds a recognized professional accounting credential (such as a CPA, CMA, CIA, CFE); or
4. The student holds a post baccalaureate degree (such as an MBA, MS, MA, JD) from an approved, US AACSB-accredited university with a minimum 3.0 GPA in graduate course work.

In addition to the aforementioned entrance requirements, an applicant's GPA in accounting prerequisites must be at least 3.0. For those students not receiving their undergraduate accounting degree at NMSU, it is expected that substantially all of the accounting prerequisite classes be from a **US AACSB accredited business school** or the application will need to be approved by the MAcc Admissions Committee. In this case the Admissions Committee may require that some of these prerequisite courses be retaken at an US AACSB institution such as NMSU.

Accounting Prerequisites (18 Credits)

Each applicant must complete, at a minimum, the following 18 credits of accounting courses from a US AACSB accredited business school prior to being considered as a candidate for the Master of Accountancy degree:

Prefix	Title	Credits
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
ACCT 301	Financial Accounting I	3
ACCT 302	Financial Accounting II	3
ACCT 403	Federal Taxation I	3
ACCT 451	Auditing Theory and Practices	3
Total Credits		18

No coursework applied toward the MAcc degree, including the prerequisite requirements, may be taken on an S/U basis.

Master of Accountancy Requirements

Candidates with an undergraduate degree in accounting must successfully complete a minimum of 30 graduate credits. Candidates with an undergraduate degree in a field other than accounting must complete additional prerequisites upon previous courses taken.

Prefix	Title	Credits
<i>Required Courses (9 credits)</i>		
ACCT 555 or ACCT 564	Federal Tax Research ¹ Financial Accounting Research	3
ACCT 559	Ethics and Professionalism in Accounting	3
ACCT 510	Technical and Professional Communication for Accountants	3
<i>Electives in ACCT from the following for a total of 5 courses (1 course may be from upper division Accounting courses numbered 450-498) (15 credits)</i>		
ACCT 530	Advanced Accounting	3
ACCT 544	Financial Statement Analysis and Valuation	3
ACCT 551	Advanced Auditing Theory and Practice	3
ACCT 560	Taxation of Corporations and Shareholders Advanced	3
ACCT 580	Professional Accountancy	3
<i>Other Courses for a total of 2 courses (6 credits approved by MAcc Program Director)</i>		
Elective 1		3
Elective 2		3
Total Credits		30

¹ If an accounting research course is not used to fulfill the research requirement, a student may take the course to fulfill an elective requirement.

MAcc Courses

Each student must complete 21 credits in accounting courses numbered above 520. These courses must include a research class (either ACCT 555 Federal Tax Research or ACCT 564 Financial Accounting Research) and Ethics in Accounting (ACCT 559 Ethics and Professionalism in Accounting). In addition, three of the credits may be in upper division undergraduate elective accounting courses numbered 450 or higher. Other specific courses to be completed by each candidate will be determined in the advisement process.

Other Courses

All students must also complete a total of 9 credits in other courses. Three of the credits must be ACCT 510 Technical and Professional Communication for Accountants, and the rest must be approved electives. Neither ACCT 503 Accounting for Managers nor any course fulfilling the foundation requirement may be included. Any student wishing to be waived from any of the above requirements may submit a petition in writing to the MAcc Director. Each request will be considered individually by the MAcc Committee.

Comprehensive Examination

There is no comprehensive examination requirement. However, satisfactory performance on a graduate portfolio assignment is a requirement for completing the MAcc degree.

Thesis: No thesis is required; however, under special approval, a candidate may elect to write a thesis under ACCT 599 Master's Thesis. Up to 6 credits may be earned for the thesis.

General

Graduate degrees require a cumulative graduate GPA of 3.0 or higher.

The Department of Accounting and Information Systems requires, in addition, that every candidate for the MAcc degree maintain at least a 3.0 grade-point average in all accounting courses used to satisfy the core

and elective course requirement. MAcc students may not retake 500-level accounting courses for which they have previously received a grade without the approval of the MAcc Admissions Committee.

Aerospace Engineering - Master of Engineering in Aerospace Engineering

Coursework Option

Prefix	Title	Credits
Requirements		
M E 570	Engineering Analysis I	3
Core Courses		
Select one course from each of the following 4 topic areas: ¹		12
<i>Aerodynamics</i>		
Select one from the following:		
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
<i>Structural Dynamics and Control</i>		
Select one from the following:		
M E 512	Vibrations	
A E 527	Linear Systems Theory	
<i>Mechanics</i>		
Select one from the following:		
M E 502	Elasticity I	
M E 504	Continuum Mechanics	
<i>Engineering Analysis</i>		
Select one from the following:		
M E 518	Finite Element Analysis	
M E 580	Engineering Analysis II	
Additional Requirements		
Select three courses (500 level or above) from any departments and two courses (500 level or above) from any college: ²		15
Total Credits		30

¹ Graduate M E courses may be substituted for A E courses with the approval of the Graduate Program Coordinator.

² If course is not in A E or M E program, approval of the Graduate Program Coordinator is required.

Academic Advisor and Final Exit Survey

Newly admitted Aerospace Engineering Masters of Engineering students will be assigned the Graduate Program Coordinator as an academic advisor.

All students must take Professional Master's Degree Exit Survey to graduate, which will be conducted by the Graduate Program Coordinator and will be taken after completing all coursework.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity

to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
A E 451	Aircraft Design	3
A E 452	Control System Design	3
A E 464	Advanced Flight Dynamics and Controls	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3
M E 504	Continuum Mechanics	3

Aerospace Engineering - Master of Science

Thesis Option

Prefix	Title	Credits
Requirements		
M E 570	Engineering Analysis I	3
Select at least 18 credits of A E graduate courses ¹		18
A E 599	Master's Thesis	6
Select one or both from the following:		3
A E 509	Individualized Study	
A E 598	Special Research Programs	
Total Credits		30

¹ Up to 6 credits of M E graduate courses may be substituted with the approval of the Graduate Coordinator. All courses must be 500 level or above. The program of study may include up to 6 credits of A E 510 (special topics courses offered formally on a one-time basis) with the approval of the Graduate Coordinator.

Publication Requirement: a refereed conference paper accepted or a refereed journal article in review or accepted by graduation. The M.S. thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

Selection of Permanent Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all coursework and thesis work.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
A E 451	Aircraft Design	3
A E 452	Control System Design	3
A E 464	Advanced Flight Dynamics and Controls	3
M E 502	Elasticity I	3

M E 503	Thermodynamics	3
M E 504	Continuum Mechanics	3

Agriculture (Agribusiness) - Master of Agriculture

The Master's of Agriculture with Concentration in Agribusiness degree provides students with the skills and knowledge necessary to successfully manage modern businesses operating in the food and fiber supply chain. The program curriculum has been developed with an emphasis on providing economic and business analytical knowledge and skills for students and industry professionals with a broad range of disciplinary backgrounds.

Candidates for the Master of Agriculture (MAG) with a concentration in Agribusiness must successfully complete a minimum of 33 graduate credits.

All students in the MAG program must successfully complete the following:

Prefix	Title	Credits
Required Courses		
AEEC 503	Introduction to Quantitative Methods	3
AEEC 506	Economic and Financial Analysis of Agribusiness	3
AEEC/BFIN 511	Advanced Derivative Markets	3
AEEC 545	Advanced Agricultural Policy	3
AEEC 550	Advanced Microcomputer Applications in Agriculture	3
AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3
AEEC 590	Special Topics (Global Food Supply Chain Management)	3
Technical Courses (6) ¹		6
Technical Course 1		
Technical Course 2		
Creative Component or Thesis (3-6 hrs) ²		3-6
AEEC 598	Creative Component Project	
AEEC 599	Master's Thesis	
Total Credits		33-36

¹ Students in consultation with their Graduate Committee Chair and with the approval of the Department Graduate Committee Chair, select two technical agriculture courses. These courses may come from another discipline or college or maybe taught within the Department of Agricultural Economics and Agricultural Business.

² In lieu of AEEC 598 Creative Component Project or AEEC 599 Master's Thesis, students can take 2 additional courses approved by their committee chair and the Department's Graduate Committee chairperson.

A thesis (AEEC 599 Master's Thesis, 4-6 credits) is not required but can replace the creative component. The course AEEC 596 Individual Study can be included as one of the 3-4 elective choices for 3 credits with any additional credits in AEEC 596 having approval of the student's graduate chair. An oral defense must be scheduled and completed as prescribed by the Graduate School. The defense must be preceded by a seminar to

present major findings of the creative component or thesis research to faculty, fellow students, and the interested public.

A Study Suggested Plan of Study

First Year		
Fall		Credits
AEEC 503	Introduction to Quantitative Methods	3
AEEC 550	Advanced Microcomputer Applications in Agriculture	3
AEEC 506	Economic and Financial Analysis of Agribusiness	3
Credits		9
Spring		
AEEC 511	Advanced Derivative Markets	3
AEEC 590	Special Topics (Global Food Supply Chain Management)	3
Technical Course ¹		3
Credits		9
Second Year		
Fall		
AEEC 545	Advanced Agricultural Policy	3
AEEC 598	Creative Component Project	3
Technical Course ¹		3
Credits		9
Spring		
AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3
AEEC 598	Creative Component Project ³	3
Credits		9
Total Credits		36

Agriculture (Domestic Animal Biology) - Master of Agriculture

The Department of Animal and Range Sciences at New Mexico State University offers a non thesis coursework Master of Agriculture degree with a Concentration in Domestic Animal Biology (MAG-DAB) which provides students with graduate training in animal nutrition and physiology. The degree is earned after satisfactory completion of 32 credit hours of upper division and graduate-level courses. The curriculum is completed in two or three academic semesters and includes a creative component which can be met in several ways.

Students having an undergraduate degree in an area of agriculture or a related field may consider the MAG-DAB as an alternative to a Master of Science which traditionally involves preparation of a thesis. Students who may benefit from this program include those in need of additional advanced science-based coursework in preparation for applying to a professional program in veterinary medicine. Other individuals may be interested in careers in the cooperative extension service, education, or the feed and pharmaceutical industries where an advanced degree may be of benefit to advancement. The curriculum outlined below will assist students in preparing for a number of career opportunities.

Admission to the Program

The MAG-DAB program is administered through the Department of Animal and Range Sciences and is coordinated by the Animal Science Graduate Committee. Admission to the program requires acceptance by the NMSU Graduate School as well as the Department of Animal and

Range Sciences. Basic requirements include an undergraduate degree in an agricultural or a related major from an accredited college or university and an undergraduate GPA of 3.0.

Depending on undergraduate training, some individuals may need to complete deficiency classes. In addition, the graduate school may require international students to complete one or more English language courses. Applications to the Department should include three letters of reference, a resume, and a statement of interest in advanced graduate training.

Once admitted to the program, each student will work with an advisor to develop a course work plan of study. The advisor and the student will also select an advisory committee consisting of two departmental faculty members and a third member from outside the department who will normally serve as the Dean's representative to the committee.

Inquiries about the MAG-DAB Program should be directed to the Chair of the Animal Science Graduate Committee.

For the Master of Agriculture with a concentration in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 Special Research Programs for the creative component.

Prefix	Title	Credits
All students in the MAG-DAB Program will complete the following classes:		
ANSC 484	Ruminant Nutrition	3
ANSC 501	Advanced Animal Nutrition (so)	3
ANSC 509	Endocrinology of Domestic Animals (f)	3
ANSC 512	Research Methods in Animal Science (s)	4
ANSC 515	Graduate Seminar ¹	1
ANSC 580	Environmental Physiology of Domestic Animals	3

Elective Courses		
In consultation with their graduate advisor, students choose at least 12 credits from the following list of core courses (other classes may be considered on an individual basis):		12

ANSC 462	Parasitology
ANSC 504	Animal Physiology Techniques (se)
ANSC 507	Laboratory Techniques in Nutrition (f)
ANSC 520	Advanced Nutritional Management I: Feedlot (se)
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocking (so)
ANSC 560	Rumen Microbiology (so)
ANSC 602	Advanced Reproductive Physiology (fo)
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)
ANSC 605	Gonadal and Uterine Endocrinology (fe)
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation (fe)
ANSC 621	Metabolic Functions and Dysfunctions (fe)

¹ must take two semesters of seminar

Creative Component

The creative component of the program involves completing at least two credits of ANSC 598 Special Research Programs. This requirement can be met in one of two ways. In consultation with the advisor, the student can select a topic of importance in domestic animal biology and prepare a comprehensive literature review covering that topic. An alternative way to meet this requirement is for the student, in consultation with the advisor, to conduct a research project and prepare a written manuscript for evaluation by the advisory committee. In either case, the student will present results of the project in the graduate Seminar (ANSC 515) and then be examined by the advisory committee.

In certain cases, the student may request approval from the Advisory Committee to complete two additional graduate courses (at least six credits) in lieu of one of the reports described above. If this approach is approved, the oral examination at the end of the program will cover all the courses completed during the MAG-DAB Program. Students pursuing this option must also prepare and present a topical seminar in ANSC 515 at some time during the program.

Agricultural and Extension Education - Master of Arts Thesis Option

Prefix	Title	Credits
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 5150	Strategic Communications Campaigns and Evaluation	3
AXED 5155	Youth Program Development and Management	3
AXED 5165	History and Philosophy of Agricultural and Extension Education	3
AXED 5320	Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences	3
AXED 5310	New Mexico Water Issues	3
AXED 5510	Research Methods	3
AXED 5515	Data Collection and Analysis	3
AXED 5999	Master's Thesis	6
Total Credits		30

Non-Thesis (Creative Component)

Prefix	Title	Credits
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 5150	Strategic Communications Campaigns and Evaluation	3
AXED 5155	Youth Program Development and Management	3
AXED 5165	History and Philosophy of Agricultural and Extension Education	3
AXED 5215	Developing Excellent Programs in Career and Technical Education	3
AXED 5310	New Mexico Water Issues	3
AXED 5320	Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences	3
AXED 5510	Research Methods	3
AXED 5515	Data Collection and Analysis	3

AXED 5994	Creative Component	3
Total Credits		30

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of AXED graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree.

You can also check the NMSU catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

AXED Courses Eligible for MAPS:

Upon approved enrollment to the AXED MAP Program, the following courses may be taken in the undergraduate program of study.

Prefix	Title	Credits
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 5155	Youth Program Development and Management	3
AXED 5150	Strategic Communications Campaigns and Evaluation	3
AXED 5320	Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences	3
AXED 5165	History and Philosophy of Agricultural and Extension Education	3
AXED 5510	Research Methods	3

Agricultural Biology - Master of Science

There is currently a strong need for M.S. graduates trained in these areas, and the demand is expected to increase dramatically.

Students are prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Ph.D. programs. Specific career opportunities include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, industry research and environmental technicians.

The Master of Science degree program in Agricultural Biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound protection of plants and animals from a wide and varied spectrum of pests.

Prefix	Title	Credits
Program Requirements		
EPWS 590	Graduate Seminar ¹	1
<i>Electives</i> ²		12
<i>Experimental Statistics</i> ³		3
<i>Courses within EPPWS</i>		13
EPWS 462	Parasitology	
EPWS 471	Plant Mineral Nutrition	
EPWS 486	Plant Virology	
EPWS 492	Diagnosing Plant Disorders	
EPWS 502	General Entomology	
EPWS 505	Advanced Integrated Pest Management	
EPWS 511	Introduction to Weed Science (f)	
EPWS 514	Plant Physiology	
EPWS 520	Environmental Behavior of Pesticides (so)	
EPWS 525	Scientific Writing- How to be a Productive and Effective Writer	
EPWS 549	Special Problems	
EPWS 551	Special Topics ⁴	
EPWS 560	Ecology and Management of Invasive Plant Species	
EPWS 573	Fungal Biology	
EPWS 599	Master's Thesis	
Total Credits		30

¹ All graduate students are required to enroll in two (2) credits of Entomology, Plant Pathology and Weed Science seminars. Typically, a student will take one seminar credit during the first semester of graduate school and present their thesis proposal plan. Each student will take the second seminar credit in their last semester and present a public exit seminar just prior to the defense of their thesis work

² *Outlines for M.S. degree plans are generated by the student in consultation with the major professor and with input from the student's assigned graduate committee.*

³ Exact course is selected with professor and/ or committee based off previous statistics experience.

⁴ Maximum of 4 credits per semester. No more than 9 credits toward a degree.

Additional Requirements- Outlines for M.S. degree plans are generated by the student in consultation with the major professor and with input from the student's assigned graduate committee.

- A minimum of 30 credit hours of graduate work is required of which:
 - a. At least 15 credits must be in courses numbered 500 or above.
 - b. At least 15 credits must be in EPWS courses.
 - c. At least half of the credits (exclusive of thesis) must be taken with other than a single professor.
- Designated hours to be completed:

1. Students must take at least four but not more than six credits in EPWS 599 Master's Thesis. Students enrolled in EPWS 599 may be asked to present progress updates.
2. At least three credit hours in graduate-level Experimental Statistics

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to a faculty advisor about your MAP plan and develop a course plan in consultation with the advisor.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
EPWS 511	Introduction to Weed Science (f)	4
EPWS 514	Plant Physiology	3
EPWS 520	Environmental Behavior of Pesticides (so)	3
EPWS 505	Advanced Integrated Pest Management	3
EPWS 573	Fungal Biology	3

Agricultural Economics - Master of Science

Students entering the MS program are required to have completed

- intermediate microeconomics and intermediate macroeconomics (completed with a B grade or better),
- a college-level calculus class, and
- a course in statistics that included linear regression analysis.

Students that have not completed these courses may be admitted with the requirement that they take them as deficiencies at the beginning of their graduate program. Prospective graduate students must have at

least a 3.0 undergraduate GPA. Students with a GPA less than 3.25 must complete the GRE or the GMAT exam.

Completion of the Master of Science degree in agricultural economics requires completion of a minimum of 33 graduate credit hours. Twenty-one of the credits must have one of the following three prefixes: AECC, ECON, or ECDV. Twenty-four of the credits must be associated with course numbers greater than 500. All students in the MS program must successfully complete the following core courses:

Prefix	Title	Credits
M.S. CORE (16-18 credits)		
AECC 501	Microeconomic Theory	3
AECC 502	Macroeconomic Theory	3
AECC 540	Econometrics I	3
AECC 585	Production Economics	3
AECC 599	Master's Thesis ¹	6
Choose 3 Classes from AEAB Block (9 hrs) ²		9
AECC/BFIN 511	Advanced Derivative Markets	
AECC 520	International Agricultural Trade Theory and Policy	
AECC 526	Global Food Supply Chain Management	
AECC 550	Advanced Microcomputer Applications in Agriculture	
AECC 551	Advanced Agribusiness Marketing	
AECC 556	Advanced Agribusiness Management	
AECC 545	Advanced Agricultural Policy ²	
AECC 575	Economics of Water Resource Management and Policy	
AECC 590	Special Topics	
AECC 596	Individual Study	
Additional Graduate Courses (~6 hrs) ³		6
Total Credits		33

¹ AECC 599 minimum hours required by the Graduate School are 4 with a maximum of 6 toward the degree. If a student elects to complete the minimum of 4 hours, they will need to take an additional course to meet the 33 hours required for the degree.

² AECC 545 must be taken as part of this AEAB Block if not previously completed as an undergraduate under AECC 445V.

³ One of these two choices may include three (3) additional hours of AECC 596. In lieu of these 2 additional graduate courses, a student may select a justifiable minor (9+ hours) per Graduate School policy and only 2 courses (6 hours) from the AEAB Block.

MS students are generally required to write a thesis (AECC 599 Master's Thesis (4-6 credits). Non-thesis options that include a non-thesis research project (AECC 597 Non-Thesis Research Project, 3 credits) or an internship (AECC 595 Internship, 3 credits) must have approval from the student's committee and the graduate chairman. Students pursuing the MS degree may not complete the graduate program with more than one C grade in the core courses. If a student receives C grades in two of these core classes one of the classes must be repeated with a grade of at least B. In addition to core courses, nine additional credits must be completed from an agricultural economics and agricultural business (AEAB) course block. AECC 545 Advanced Agricultural Policy must be taken in the graduate program if an agricultural policy course was not taken as an undergraduate. Individual study (AECC 596 Individual Study) is limited to 6 credits hours toward a the degree. An oral defense is required of all master's candidates and will be scheduled and completed

according to the guidelines of the Graduate School. The oral defense must be preceded by an open seminar to present major research findings to faculty, fellow students and the interested public.

Athletic Training - Master of Science

The Master of Science in Athletic Training (MSAT) program at NMSU comprises 60 credit hours of coursework through traditional and hybrid courses. The MSAT is a 2-year (24-month) professional degree program that starts in June and prepares students to sit for the Board of Certification (BOC) exam leading to the ATC credential. NMSU is currently seeking accreditation for the program through the Commission on Accreditation of Athletic Training Education. Admissions are competitive, and applications are managed via the ATCAS (<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fatcas.liaisoncas.com%2Fapplicant-ux%2F%23%2Flogin&data=05%7C01%7Ckbrock%40nmsu.edu%7Cd228741566ea4134dc0908daeea5592d%7Ca3ec87a89fb84158ba8ff11bace1ebaa%7C1%7C0%7C638084691182801088%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IkhWwL%7C3000%7C%7C%7C&sdata=gp8M%2FW6l6ReVZ7tC5gGCAXuCWXmpwHa7TeZY%2Bd0WMLE%3D&reserved=0>) central application system. The application deadline is April 15th. Interested students can contact the Athletic Training Program Director, Kim O'Connell (kbrock@nmsu.edu) (575-646-5744) for further information.

The MSAT program at NMSU will consist of a minimum of 60 credit hours of coursework to be completed in the home department of Kinesiology at NMSU through both traditional and hybrid courses. The program provides a two-year (24-month) comprehensive exposure to Athletic Training designed to prepare individuals to become competent, independent clinicians who will enhance the quality of patient health care and advance the profession of athletic training through the application of evidence-based practice and translational research.

Theoretical coursework in the areas of injury prevention and care, injury evaluation and treatment, and therapeutic interventions of athletic injuries are included, as are clinical components that provide a progressive approach with observation, integrative and immersive experiences in clinical settings both on and off-campus.

Upon completion of the MSAT, students will be eligible to sit for the national Board of Certification (BOC) exam required to practice as an athletic trainer, leading to the ATC credential.

Enrollment in graduate courses in Athletic Training is limited to students who have been accepted into the MSAT program. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria, which are aligned with CAATE accreditation standards.

Instructions on application procedures for the MSAT can be found on the Kinesiology Department webpage. Questions may be directed to Kim O'Connell (kbrock@nmsu.edu) the Program Director for Athletic Training.

Prefix	Title	Credits
Theoretical Coursework		
SPMD 4805	Emergency Response	2
SPMD 5005	Foundations of Athletic Training	3
SPMD 5205	Evidence Based Practice	2
SPMD 5510	Psychology of Sport	3

SPMD 6005	Athletic Training Research I	2
SPMD 6010	Organization and Administration in Athletic Training	2
Clinical Coursework		
SPMD 5010	Clinical & Functional Anatomy in Athletic Training	2
SPMD 5120	Lower Extremity Injury Evaluation + Lab	4
SPMD 5220	Upper Extremity Injury Evaluation + Lab	4
SPMD 6020	Evaluation of the Head, Neck, Spine and Torso	3
SPMD 6280	General Medical Conditions & Therapeutic Medications	4
SPMD 5180	Therapeutic Interventions I	4
SPMD 5280	Therapeutic Interventions II	4
SPMD 5050	Clinical Education I	3
SPMD 5150	Clinical Education II	3
SPMD 5250	Immersive Clinical Experience	3
SPMD 6050	Clinical Education III	3
SPMD 6150	Clinical Education IV	3
Capstone Coursework		
SPMD 6110	Professional Preparation	3
SPMD 6999	Capstone Project I	3
Optional Electives		0-3
SPMD 5310	Inferential Statistics in Sports and Exercise Science	
SPMD 5350	Principles of Strength and Conditioning	
SPMD 5410	Biomechanics	
SPMD 6350	Advanced Exercise Physiology	
Total Credits		60-63

A Suggested Plan of Study:

The program follows a cohort model, with students progressing through the required coursework in a specific sequence. Below is a proposed plan of study for the MSAT:

First Year		
Semester 1		Credits
SUMMER		
SPMD 4805	Emergency Response	2
SPMD 5005	Foundations of Athletic Training	3
SPMD 5010	Clinical & Functional Anatomy in Athletic Training	2
Credits		7
Semester 2		
FALL		
SPMD 5050	Clinical Education I	3
SPMD 5120	Lower Extremity Injury Evaluation + Lab	4
SPMD 5180	Therapeutic Interventions I	4
Credits		11
Semester 3		
SPRING		
SPMD 5150	Clinical Education II	3
SPMD 5220	Upper Extremity Injury Evaluation + Lab	4
SPMD 5280	Therapeutic Interventions II	4
SPMD 5510	Psychology of Sport	3
Credits		14

Second Year

Semester 1

SUMMER

SPMD 6010	Organization and Administration in Athletic Training	2
SPMD 5205	Evidence Based Practice	2
SPMD 5250	Immersive Clinical Experience	3

**SPMD 5250 Immersive Clinical Experience may be taken in any semester of the 2nd year following approval from the coordinator of clinical education

Credits		7
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Semester 2

FALL

SPMD 6050	Clinical Education III	3
SPMD 6280	General Medical Conditions & Therapeutic Medications	4
SPMD 6020	Evaluation of the Head, Neck, Spine and Torso	3
SPMD 6005	Athletic Training Research I	2

Credits		12
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Semester 3

SPMD 6150	Clinical Education IV	3
SPMD 6110	Professional Preparation	3
SPMD 6999	Capstone Project I	3

Credits		9
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Total Credits		60
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Animal Science - Master of Science General Requirements

Graduate students must maintain at least a 3.0 grade point average. A minimum of 30 credit hours of graduate work if required, the following parameters must be met within those credits but can overlap.

1. At least 15 credits must be in courses numbered 500 or above
2. At least 15 credits must be in Animal Science courses
3. At least 15 credits (exclusive of ANSC 598) must be taken with other than a single professor

Prefix	Title	Credits
Required Courses		
ANSC 599	Master's Thesis	6
ANSC 515	Graduate Seminar	2
ANSC 512	Research Methods in Animal Science (s)	3-4
or A ST 512	Quantitative Analysis for Business Decisions	
Choose 18-19 credits from the following, ensuring the above parameters are met:		18-19
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 484	Ruminant Nutrition	
ANSC 501	Advanced Animal Nutrition (so)	
ANSC 504	Animal Physiology Techniques (se)	
ANSC 507	Laboratory Techniques in Nutrition (f)	
ANSC 509	Endocrinology of Domestic Animals (f)	
ANSC 510	Range Nutrition Techniques (se)	
ANSC 512	Research Methods in Animal Science (s)	
ANSC 515	Graduate Seminar	
ANSC 520	Advanced Nutritional Management I: Feedlot (se)	

ANSC 521	Advanced Nutritional Management II: Cow Calf/Stockler (so)
ANSC 522	Animal Nutrition (f)
ANSC 560	Rumen Microbiology (so)
ANSC 580	Environmental Physiology of Domestic Animals
ANSC 602	Advanced Reproductive Physiology (fo)
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)
ANSC 605	Gonadal and Uterine Endocrinology (fe)
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation (fe)
ANSC 621	Metabolic Functions and Dysfunctions (fe)
ANSC 625	Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo)
ANSC 626	Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)
Total Credits	
30	

Graduate Assistants

1. All graduate assistants must enroll as full-time students taking at least 9 graded graduate credits (courses numbered 450 and above). No audits can be taken as part of the 9 minimum credits. Only 3 of the 9 credits may be taken as an S/U option.
2. A graduate assistant may not enroll for more than 15 credits each semester.
3. If a student needs to take deficiency courses as part of the 9 credits, then a memo from the advisor or department head should be submitted to the Graduate School. If approved, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at New Mexico State University.
4. Enrollment during summer sessions is not required.

Additional Requirements

1. A maximum of six credits in S/U courses may be taken during a Master's program
2. A maximum of six credits (four in a single semester) in ANSC 598 (Special Research Programs) may be taken during a Master's program.
3. If a minor is declared, a minimum of eight credits in this discipline must be completed and approved by that department.
4. In certain instances, deficiency courses may be required.
5. Attendance at graduate seminars is urged.
6. Graduate students are encouraged to adapt their thesis data for submission as a scientific journal article, an Experiment Station Bulletin, or research report.

The Masters Committee

The Masters Committee is appointed by the student's advisor with the approval of the Department Head and consists of four members including three from the animal science area and one representative from the Graduate School.

The Masters Final Examination

The Masters Final Oral Examination is primarily concerned with the thesis research conducted by the student but it may also extend over the entire discipline. Candidates for a Masters Degree are expected to demonstrate a thorough understanding of their research topic including how it was conducted, the results that were found, and what the results mean. They should also demonstrate knowledge of the general discipline of Animal Science.

Anthropology - Master of Arts

The Anthropology M.A. program is designed for students who are interested in the traditional sub-disciplines of anthropology, as well as such related fields as cultural resource management, food studies, medical anthropology, and museum studies. The program is directed to both students planning to complete a professional M.A. degree and students planning to enter a Ph.D. program. In addition to the M.A. in Anthropology, our program offers graduate minors in anthropology, archaeology, and food studies, as well as Graduate Certificates in cultural resource management and museum studies. The faculty encourage all graduate students to develop graduate minors and certificates, enhancing their specialized training in anthropology.

Program Outcomes:

1. Develop and execute a problem-oriented anthropological study using appropriate theoretical and methodological perspectives in at least one sub-field of anthropology. The study may focus on applied/ practicing work or standard academic research, and will report the results in the form of a master's thesis, professional internship report, or professional research project report. The final thesis or report must show substantive data analysis by the student, directed toward an explicit anthropological research question.
2. Demonstrate effective written and verbal communication skills in professional settings.
3. Demonstrate professional engagement with peers, faculty, staff, researchers, and other professionals in anthropology.

An undergraduate anthropology degree is not required for entry into the M.A. program. Applicants who lack the equivalent of ANTH 301, ANTH 315, and ANTH 355 may be required to take these courses or corresponding sections of ANTH 502. ANTH 350 or the equivalent is recommended. Applicants without an undergraduate degree in anthropology are encouraged to contact the Graduate Advisor before applying to the M.A. program in anthropology.

The M.A. Program in Anthropology at NMSU is enrolled as an eligible graduate program under the Western Regional Graduate Program (<https://www.wiche.edu/tuition-savings/wrgp/>) (WRGP). WRGP allows master's, graduate certificate, and doctoral students who are residents of Western Interstate Commission for Higher Education (WICHE) member states to enroll in graduate programs outside of their home state and pay in-state resident tuition. Residents of the following states and territories are eligible to attend the M.A. Program in Anthropology at NMSU for in-state tuition rates: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, U.S. Pacific Territories and Freely Associate States, Utah, Washington, and Wyoming. Interested graduate applicants should apply directly to the NMSU Graduate School and *identify themselves as WICHE WRGP applicants*. WRGP applicants must meet NMSU's WRGP admission requirements and deadlines. If you have further questions about

the WRGP program and your eligibility, please contact Kelly Jenks at kljenks@nmsu.edu (Istanfor@nmsu.edu).

Admission Requirements

To apply to the Anthropology Masters Degree program the following materials are required:

- Graduate School application form and fees
- Official undergraduate and graduate transcripts from all colleges and universities attended, with a 3.0 GPA minimum.
- A letter from the candidate addressing his or her interests and graduate school objectives
- Letters of recommendation from three persons familiar with the candidate’s academic record

All the above items should be submitted through the Graduate School’s central admission system at: <https://gradschool.nmsu.edu/>

NOTE: The GRE is not required.

NOTE: In addition to the above, international applicants also need to view the requirements of admission to the university and provide additional documentation online, at this page: <https://isss.nmsu.edu/index-2/> (<https://isss.nmsu.edu/>)

NOTE: students may matriculate in either August or January. If a student wishes to be considered for a Graduate Assistantship, the application must be completed by **February 15** for admission in the fall semester. Assistantships are not usually offered for students matriculating in January, but they may be considered in subsequent semesters for an award.

For more information about the Anthropology Graduate Program contact:

Dr. Kelly Jenks, Anthropology Graduate Advisor at: kljenks@nmsu.edu

Dr. Rani Alexander, Anthropology Department Head at: raalexan@nmsu.edu

The Anthropology M.A. program is designed for students who are interested in the traditional sub-disciplines of anthropology, as well as such related fields as cultural resource management, food studies, medical anthropology, and museum studies. The program is directed to both students planning to complete a professional M.A. degree and students planning to enter a Ph.D. program. In addition to the M.A. in Anthropology, our program offers graduate minors in anthropology, archaeology, food studies, and Native American Studies, as well as Graduate Certificates in cultural resource management and museum studies. The faculty encourage all graduate students to develop graduate minors and certificates, enhancing their specialized training in anthropology.

An undergraduate anthropology degree is not required for entry into the M.A. program. Applicants who lack the equivalent of ANTH 301, ANTH 315, and ANTH 355 may be required to take these courses or corresponding sections of ANTH 502. ANTH 350 or the equivalent is recommended. Applicants without an undergraduate degree in anthropology are encouraged to contact the Graduate Advisor before applying to the M.A. program in anthropology.

Prefix	Title	Credits
ANTH 301	Cultural Anthropology	
ANTH 315	Introduction to Archaeology	

ANTH 350	Anthropological Theory
ANTH 355	Biological Anthropology

Program Requirements

Students selecting the thesis option must complete 33 hours of basic course work, as described below, plus 6 hours of thesis credit. Students selecting the non-thesis option must complete 39 hours of course work including an internship or special research project for 6 credits.

The 33 hours of basic course work for students selecting either the thesis or non-thesis options are distributed as follows:

Prefix	Title	Credits
Core Graduate Courses ¹		6
ANTH 503	Anthropological Theory (Fall only)	
ANTH 505	Issues in Anthropological Practice (Spring only)	
Additional Courses		27
Select additional topical, methodological, and area courses in anthropology ¹		
Students may count six credits from any discipline outside of Anthropology toward the total 27 credits of additional courses		
Thesis or Non-Thesis Options		
Select either a Thesis or Non-Thesis Track:		6
Thesis		
ANTH 599	Master’s Thesis	
Non-Thesis		
ANTH 597 or ANTH 598	Internship Special Research Problems	
Total Credits		39

¹ earning a grade of B or better

The MAP program encourages qualified undergraduate students to consider taking graduate-level courses in their junior or senior years. It is a dual credit program whereby eligible students can “double count” up to 9 graduate-level credits by applying them to their BA degree as well as to the graduate degree if they are later admitted to the MA in Anthropology or another Graduate degree program.

Students may not attempt more than 3 credits of graduate coursework in one semester. Students must earn a grade of B or higher to have graduate credits count under the MAP program. Graduate courses completed with a B- or lower are not eligible for MAP credit.

Students are not guaranteed admission to a graduate program by participating in the MAP program (it is a dual credit program, **not** a dual degree program). They still need to apply to the MA program in Anthropology or to their chosen NMSU graduate program and submit an application for admission if they wish to complete a Master of Arts, graduate minor, or graduate certificate in the Department of Anthropology. Students may be able to transfer graduate credits to programs at other universities, but the program directors and Graduate Schools of those universities will have their own rules and policies regarding transfer credit and may not accept graduate credits earned at NMSU.

Honors Credit Undergraduate students who obtain a grade of B or higher in graduate level classes can count their credits as Honors credits.

Undergraduate students who earn a grade of B or higher in two 3-credit graduate classes will automatically graduate with an Honors Certificate.

MAP Requirements

- Undergraduate students must be juniors or seniors and have completed 60 credit hours of coursework towards an undergraduate degree.
- If the student intends to apply for the MA in Anthropology, completion of the undergraduate core courses, ANTH 301 Cultural Anthropology, ANTH 315 Introduction to Archaeology, ANTH 355 Biological Anthropology, and ANTH 350 Anthropological Theory is strongly preferred.
- Preferred 3.5 GPA or above.
- Undergraduate students must have an assigned faculty advisor within the Department of Anthropology and must meet with their advisor at least once per semester before registration.
- Students must speak to their financial aid advisor before being approved for MAPS.
- Students accepted into the master's accelerated program, must participate in the Online Developing New Scholars Program (DNSP), offered by the Graduate School. The purpose of DNSP is to create access for success in graduate education by providing formal mentoring.
- Students may not have previously earned a Bachelor's Degree.
- Students have removed any Incomplete grades or holds at the time that they request admission to a graduate-level class.

Additional Program Guidelines:

Faculty can invite eligible students to consider taking graduate-level coursework. Students can also ask faculty for permission to take a graduate class. In all cases, students should speak with their advisors to make sure that the chosen classes are suitable for their planned program of study.

In most cases, the student should be enrolled in a total of only 15 credit hours per semester. Overloads of 18 or more credits are **not** advisable.

Registration in graduate classes must be approved by the course instructor and the student's MAP faculty advisor, with notification and approval of the Anthropology Department Head and the NMSU Graduate School.

A student may withdraw their participation at any point from an approved Master's Accelerated Program by informing, in writing, the respective department-head with a copy sent to the Dean of the Graduate School.

The student's MAP form must be fully approved by the Department and NMSU Graduate School **before** the student may register for a graduate level course. In no instances can a graduate course 'count' towards the student's graduate degree retroactively under MAPS.

Accepted MAP Courses:

Upon approved enrollment to the Anthropology MAP Program, the following courses may be taken as electives in the undergraduate program of study. They count as graduate electives in topical, methodological, and area courses in the student's graduate program of study. Additional course offerings may be approved for Anthropology MAP with permission of the Department Head and the student's MAP advisor.

Prefix	Title	Credits
ANTH 515	Applied Anthropology	3
ANTH 516	Advanced Archaeology of the American Southwest	3
ANTH 520	Ethnographic Field Methods	3
ANTH 540	Cultural Resource Management	3
ANTH 533	Advanced Issues in Sex, Gender, and Culture	3
ANTH 545	Advanced Museology	3

Please note that the graduate core classes ANTH 503 Anthropological Theory and ANTH 505 Issues in Anthropological Practice are **excluded** from the MAP eligible course list.

Individualized study courses such as ANTH 596 Readings, ANTH 597 Internship, ANTH 597 Internship, and ANTH 599 Master's Thesis are **excluded** from the MAP eligible course list.

Applied Statistics - Master of Science

The Department of Economics, Applied Statistics and International Business offers the Master of Science (MS) degree in applied statistics. The applied statistics program produces graduates proficient in the practice of statistics and prepared to enter directly into positions in government or industry. Students in the program receive instruction in both the theory and the application of statistics, with an emphasis on experimental design and modeling. Statistical software packages, which are necessary for modern data analysis, are used throughout the curriculum. The program culminates in a capstone course in which students gain experience in analyzing real-world data.

Students from a variety of disciplines, including mathematics, psychology, engineering, and the natural sciences, have successfully completed the MS in applied statistics.

Admission

Requirements for regular admission to the MS in applied statistics include the following:

- A minimum 3.0-grade point average overall or in the last two years of study. Complete graduate and undergraduate transcripts must be supplied.
- Three semesters of calculus, equivalent to NMSU courses MATH 1511G Calculus and Analytic Geometry I MATH 1521G Calculus and Analytic Geometry II, and MATH 2530G Calculus III, completed with grades of B or better.
- Three letters of reference from former professors or others able to evaluate the student's academic potential.
- A one- to two-page typewritten letter of application, discussing academic objectives, professional plans, and specific reasons for selecting statistics as a field for advanced study.

In addition to the formal requirements above, some experience in computer programming is strongly recommended.

Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). Fluency in written and spoken English is essential to successful completion of the program. Further information regarding the TOEFL can be obtained from <https://issn.nmsu.edu/>.

Students must choose one of two options to complete the course requirements: the research option or the coursework-only option.

Research Option

Under the research option, the combined research (A ST 598 or A ST 599) and elective credits must equal nine. The number of research credits may vary from four to six, with the remaining credits fulfilled with electives.

Prefix	Title	Credits
Theory		
A ST 565	Statistical Analysis I	3
A ST 566	Statistical Analysis II	3
Methods		
A ST 503	SAS Basics	3
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
A ST 507	Advanced Regression	3
A ST 509	Statistical Models for Complex Data Structures	3
Research		
A ST 598 or A ST 599	Special Research Problems Master's Thesis	4-6
Electives		
Electives sufficient to bring total credits to 34		5-3
Capstone		
A ST 554	Practicum in Statistics	3
Total Credits		34

Coursework Only Option

Prefix	Title	Credits
Theory		
A ST 565	Statistical Analysis I	3
A ST 566	Statistical Analysis II	3
Methods		
A ST 503	SAS Basics	3
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
A ST 507	Advanced Regression	3
A ST 509	Statistical Models for Complex Data Structures	3
Electives		
Electives sufficient to bring total credits to 34		9
Capstone		
A ST 554	Practicum in Statistics	3
Total Credits		34

Art - Master of Arts
Emphasis: Art History

An emphasis in art history requires a minimum of 33 credits of art history courses, 6 of which must be thesis credits. Additionally, 3 credits of related courses outside the Art Department must be taken with the approval of the department head and the student's major advisor.

Reading proficiency in a foreign language is also required and should be acquired prior to the beginning of thesis research for which it will be employed. A reading proficiency exam will be arranged in conjunction with the major advisor. Admission to the MA program with an emphasis in art history is based on an accredited BA or BS degree (or equivalent),

including at least 18 credits in art history, museum studies, visual studies, or related disciplines. Undergraduate deficiencies must be completed before advancement to candidacy.

Prefix	Title	Credits
ARTH 579	Graduate Seminar: Art Theory, Criticism, Historiography	3
ARTH 599	Art History Thesis	6
Six 500-level ARTH Courses ¹		24
One 450 and above level course outside of the Department of Art		3
Total Credits		36

¹ ARTS 576 Museum/Gallery Research Internship may also be used once to fulfill this requirement

Candidacy and Thesis Committee Selection

Upon satisfactory completion of all required course work (except thesis credits) and foreign language requirement, the student will prepare a thesis proposal under the direction of the major professor. The student will then select the second member of his or her thesis committee and submit the proposal to this committee member for approval. With the backing of these two advisors, the student must then present the proposal to the department faculty. After a successful presentation, the student will advance to candidacy and select the third committee member, who may be from outside the art department.

Astronomy - Master of Science

The Astronomy Department at NMSU offers programs leading to the Master of Science and the Doctor of Philosophy degrees. Graduate courses (http://astronomy.nmsu.edu/?page_id=2503) cover topics in astrophysics, stellar atmospheres, observational techniques, the interstellar medium, galactic structure, star formation and evolution, extragalactic objects, cosmology, and solar system studies. Students also take courses in other relevant fields to broaden their knowledge and capabilities.

Upon successful completion of the written and oral portions of the PhD comprehensive exam, it is the intention of the department that a student be awarded an M.S. degree in Astronomy. Other students may elect to pursue a Terminal Master's degree rather than a Ph.D. upon the advice of their committee.

Terminal Masters: Thesis track

The rules for a Terminal M.S.: Thesis track are outlined below.

For the Terminal M.S. degree in Astronomy, the student must satisfy the requirements of the Department as well as those established by the Graduate School. The Department requires a minimum of 33 credits of which six are generally for Master's Thesis research.

The MINIMUM course requirements for a Thesis MS will include

Prefix	Title	Credits
ASTR 500	Seminar (3 credits (1 per semester)) ⁵	3
Choose five courses from the following ASTR courses ⁶		15
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	

ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional two courses from ASTR courses above, OR from the courses below ⁷		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
C S 579	Special Topics	
<i>Special Research Programs</i> ⁴		
ASTR 598	Special Research Programs	3
<i>Masters Research</i>		
ASTR 599	Master's Thesis	6
Total Credits		33

⁴ ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

⁵ ASTR 500 Seminar is 1-credit course. It should be taken each semester, for 3 total credits over this track

⁶ Any 15 credits (5 courses) selected from these. Each course may only be taken for 3 credits.

⁷ In addition to 5 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 7 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.

A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.

If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and C S, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

Terminal Masters: Coursework-only track

The rules for a Terminal M.S.: Coursework-only track are outlined below.

A thesis is nearly always required for a Terminal M.S. degree. However, under some exceptional circumstances, the thesis requirement may be waived, in which case the credit requirements must be satisfied in formal course work. Such a waiver requires agreement by both the student's committee and the Department Head. In all cases, the student seeking a Terminal M.S. degree must pass a final oral examination covering course and any relevant research work. Any regular Terminal M.S. degree program will require a thesis.

For a student who has decided and been approved to pursue a Coursework only MS Astronomy degree, the MINIMUM course requirements are:

Prefix	Title	Credits
ASTR 500	Seminar (3 credits (1 per semester)) ⁵	3
Choose seven courses from the following ASTR courses ⁸		21
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional two courses from ASTR courses above, OR from the courses below ⁹		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
C S 579	Special Topics	
<i>Special Research Programs</i> ⁴		
ASTR 598	Special Research Programs	3
Total Credits		33

⁵ ASTR 500 Seminar is 1-credit course. It should be taken each semester, for 3 total credits over this track

⁸ Any 21 credits (7 courses) selected from these. Each course may only be taken for 3 credits.

⁹ In addition to 7 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 9 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.

A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level. If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and C S, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

⁴ ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

Masters degree: Upon completion of PhD comprehensive exam track

The requirements for the Masters track are for the student to have completed their PhD comprehensive exam, and the following credits:

Prefix	Title	Credits
ASTR 500	Seminar (4 credits (1 per semester)) ¹	4
Choose nine courses from the following ASTR courses ²		27
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional two courses from ASTR courses above, OR from the courses below ³		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
C S 579	Special Topics	
<i>Special Research Programs</i> ⁴		
ASTR 598	Special Research Programs	3
<i>Pre-dissertation Research</i> ⁵		

ASTR 600	Pre-dissertation Research	6
Total Credits		46

- ¹ ASTR 500 Seminar is 1-credit course. It should be taken each semester, for 4 total credits over the program
- ² Any 27 credits (9 courses) selected from these. Each course may only be taken for 3 credits.
- ³ In addition to 9 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 7 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.
- A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level. If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and C S, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.
- ⁴ ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

Year A

A Suggested Plan of Study For Students

A typical roadmap for the Masters Thesis track program, including course and credit-hour minimum requirements, is summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs and ASTR 599 Master's Thesis are offered every semester, as one-on-one research credits with an advisor.

For a student on wishing to pursue a Master Coursework-only track, they may substitute the 6 credits of 599 credits for any of the regular Yr A or Yr B courses

First Year		Credits
Fall		
ASTR 500	Seminar ¹	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two courses from the following:		6
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	

ASTR 605	Interstellar Medium	
Credits		10
Spring		
ASTR 500	Seminar ¹	1
Choose three courses from the following		9
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
Credits		10
Second Year		
Fall		
ASTR 500	Seminar ¹	1
Choose one from the following: ²		3
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
Research Programs Course ²		0-3
ASTR 598	Special Research Programs ²	
ASTR 599	Master's Thesis ^{3,4}	3
Credits		7-10
Spring		
ASTR 599	Master's Thesis ^{3,4}	3-9
Choose one from the following:		3
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
Research Programs Course ²		0-3
ASTR 598	Special Research Programs ²	
Credits		6-15
Total Credits		33-45

¹ Students **must** take ASTR 500 Seminar as 1-credit in each of their first 3 semesters, for a total of 3 credits over 2 years

² Students **must** take ASTR 598 Special Research Programs for 3 credits during fall of Yr2 or spring of Yr2.

³ Students on a Thesis track **must** take 6 total credits of ASTR 599 Master's Thesis in Yr 2. Students on a coursework-only track may substitute any 6 credits of regular Yr2 course in place of 599 credits

⁴ Students on a Thesis track who have completed 10 credits in each of their first 3 semesters, including 3 ASTR 598 Special Research Programs and 3 ASTR 599 Master's Thesis in fall of Yr2 only require 3 credits of ASTR 599 in spring of Yr2 in order to meet minimum requirements as detailed in Course Requirements above. Students on a Coursework-only track who have completed 10 credits in each of their first 3 semester, including 3 ASTR 598, only require 3 more regular course credits in spring of Yr2. However graduate students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses. For students who do not complete their Masters in 2 years, they should continue to enroll in ASTR 599 in future semesters.

Year B

A Suggested Plan of Study For Students

A typical roadmap for the Masters Thesis track program, including course and credit-hour minimum requirements, is summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs and ASTR 599 Master's Thesis are offered every semester, as one-on-one research credits with an advisor.

For a student on wishing to pursue a Master Coursework-only track, they may substitute the 6 credits of 599 credits for any of the regular Yr A or Yr B courses

First Year		
Fall		Credits
ASTR 500	Seminar ¹	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two courses from the following:		6
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
Credits		10
Spring		
ASTR 500	Seminar ¹	1
Choose three from the following:		9
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
Credits		10
Second Year		
Fall		
ASTR 500	Seminar ¹	1
Choose one from the following: ²		3
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
Research Programs Course ²		0-3
ASTR 598	Special Research Programs	
ASTR 599	Master's Thesis ^{3,4}	3
Credits		7-10
Spring		
ASTR 599	Master's Thesis ^{3,4}	3
Choose one from the following:		3
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
Research Programs Course ²		0-3
ASTR 598	Special Research Programs	
Credits		6-9
Total Credits		33-39

¹ Students **must** take ASTR 500 Seminar as 1-credit in each of their first 3 semesters, for a total of 3 credits over 2 years

² Students **must** take ASTR 598 Special Research Programs for 3 credits during fall of Yr2 or spring of Yr2.

³ Students on a Thesis track **must** take 6 total credits of ASTR 599 Master's Thesis in Yr 2. Students on a coursework-only track may substitute any 6 credits of regular Yr2 course in place of 599 credits

⁴ Students on a Thesis track who have completed 10 credits in each of their first 3 semesters, including 3 ASTR 598 Special Research Programs and 3 ASTR 599 Master's Thesis in fall of Yr2 only require 3 credits of ASTR 599 in spring of Yr2 in order to meet minimum requirements as detailed in Course Requirements above. Students on a Coursework-only track who have completed 10 credits in each of their first 3 semester, including 3 ASTR 598, only require 3 more regular course credits in spring of Yr2. However graduate students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses. For students who do not complete their Masters in 2 years, they should continue to enroll in ASTR 599 in future semesters.

Bioinformatics - Master of Science

The degree requirements include 30-31 graduate credit hours. The degree has **two tracks**, one for students with non-computing background and another for students with Computer Science background. The requirements for each track are structured as follows.

Track: Non-Computing Background

Prefix	Title	Credits
Required Courses		
Core Courses		
BIOL 550	Special Topics (Command Line Bioinformatics)	3
A ST 505	Statistical Inference I	4
C S 453	Python Programming I	3
BIOL 550	Special Topics (R for ecological sciences)	3
or C S 458	R Programming I	
C S 509	Bioinformatics Programming	3
C S 508	Introduction to Data Mining	3
or C S 519	Applied Machine Learning I	
Elective Courses (2 from the following list)		6
C S 462	Object Oriented Programming Transition	
C S 516	Bioinformatics	
C S 586	Algorithms in Systems Biology	
GENE 452	Applied Bioinformatics	
or BIOL 566	Advanced Bioinformatics and NCBI Database	
A ST 550	Special Topics (Statistical bioinformatics course)	
A ST 550	Special Topics (Current topics in bioinformatics - open issues)	
Master's Project/Thesis/Internship ¹		6
C S 598	Master's Project	
or C S 599	Master's Thesis	
Total Credits		31

¹ A student can write a thesis (C S 599 Master's Thesis), undertake a research project (C S 598 Master's Project), or participate in an internship related to the degree. In each case, six graduate credits are required and a written approval from the student's advisor must be obtained before the student undertakes this part of the study. For students with thesis or project, the students are required to sustain a final exam, covering the thesis/research project.

² One course to cover prerequisites to enter GENE 315 Molecular Genetics and BCHE 341 Survey of Biochemistry is required.

Track: Computer Science Background

Prefix	Title	Credits
Required Courses ²		
C S 508	Introduction to Data Mining	3
C S 509	Bioinformatics Programming	3
C S 570	Analysis of Algorithms	3
C S 586	Algorithms in Systems Biology	3
C S 581	Advanced Software Engineering	3
Select one from the following:		3
C S 516	Bioinformatics	6
GENE 452	Applied Bioinformatics	
BIOL 566	Advanced Bioinformatics and NCBI Database	
Elective Courses (2 from the following list)		6
A ST 505	Statistical Inference I	6
A ST 506	Statistical Inference II	
BCHE 546	Biochemistry II	
BCHE 649	Topics in Biochemistry	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 478	Molecular Biology of Microorganisms	6
BIOL 490	Neurobiology	
BIOL 520	Molecular Cell Biology	
BIOL 566	Advanced Bioinformatics and NCBI Database	
C S 502	Database Management Systems I	
C S 505	Artificial Intelligence I	
C S 516	Bioinformatics	6
C S 521	Parallel Programming	
C S 575	Artificial Intelligence II	
C S 582	Database Management Systems II	
GENE 452	Applied Bioinformatics	
GENE 486	Genes and Genomes	
GENE 488	Gene Regulation	6
MOLB 542	Biochemistry I	
MOLB 546	Biochemistry II	
MOLB 590	Discussions in Molecular Biology	
Master Thesis/Project/Internship ¹		6
C S 599	Master's Thesis	6
or C S 598	Master's Project	
Total Credits		
Total Credits		30

¹ A student can write a thesis (C S 599 Master's Thesis), undertake a research project (C S 598 Master's Project), or participate in an internship related to the degree. In each case, six graduate credits are required and a written approval from the student's advisor must

be obtained before the student undertakes this part of the study. For students with thesis or project, the students are required to sustain a final exam, covering the thesis/research project.

² One course to cover prerequisites to enter GENE 315 Molecular Genetics and BCHE 341 Survey of Biochemistry is required.

Degree Road Map

- **For students with non-computing background**
 - Semester 1: Command Line bioinformatics, C S 458 R Programming I, A ST 505 Statistical Inference I
 - Semester 2: C S 453 Python Programming I, one elective course, C S 509 Bioinformatics Programming
 - Semester 3: C S 508 Introduction to Data Mining, Master's project/thesis/internship (3 credits), one elective
 - Semester 4: Master's project/thesis/internship (3 credits)
- **For students with Computer Science background**
 - Semester 1: The course to cover the prerequisites to enter GENE 315 Molecular Genetics and BCHE 341 Survey of Biochemistry, A ST 505 Statistical Inference I, C S 508 Introduction to Data Mining
 - Semester 2: C S 509 Bioinformatics Programming, GENE 315 Molecular Genetics, BCHE 341 Survey of Biochemistry
 - Semester 3: Master's project/thesis/internship (3 credits), two electives
 - Semester 4: Master's project/thesis/internship (3 credits)

A Suggested Plan of Study for Students (with non-computing background)

It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Semester 1		Credits
C S 458	R Programming I	3
A ST 505	Statistical Inference I	4
Command Line Bioinformatics		3
Credits		10
Semester 2		
C S 453	Python Programming I	3
C S 509	Bioinformatics Programming	3
Elective Course		3
Credits		9
Semester 3		
C S 508	Introduction to Data Mining	3
Elective Course		3
Master's Project/thesis or internship		3
Credits		9
Semester 4		
Master's project/thesis or internship		3
Credits		3
Total Credits		31

A Suggested Plan of Study for Students (with a Computer Science background)

It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Semester 1		Credits
C S 508	Introduction to Data Mining	3
C S 509	Bioinformatics Programming	3
BIOL 566	Advanced Bioinformatics and NCBI Database	3
Credits		9
Semester 2		
C S 516	Bioinformatics	3
C S 570	Analysis of Algorithms	3
GENE 452	Applied Bioinformatics	3
Credits		9
Semester 3		
C S 581	Advanced Software Engineering	3
C S 586	Algorithms in Systems Biology	3
Elective Course ¹		3
Credits		9
Semester 4		
Master's project/thesis or internship		3
Elective Course ¹		3
Credits		6
Total Credits		33

Biology - Master of Science

The Master of Science degree can be obtained through either a thesis option or a non-thesis option. Both options require 30 credits of course work. The non-thesis option can be completed as an accelerated (one-year) program concentrating in biotechnology or through an individual degree plan in consultation with the student's Master of Science committee.

There are two formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are

Prefix	Title	Credits
Course Requirements		
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3

For research toward the Master of Science degree, students can choose among the Department's three areas of emphasis:

1. Behavioral, Ecological and Evolutionary Biology

The Behavioral, Ecological and Evolutionary Biology program is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the behavior, ecology, and evolution of living and extinct taxa.

2. Cell and Organismal Biology

The Cell and Organismal Biology program is appropriate for all Graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms. This emphasis focuses in faculty areas of expertise in

cell and molecular biology, neurobiology, developmental biology, and physiology.

3. Microbiology

The Microbiology curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and protists) such as their physiology, ecology, development or evolution.

All graduate students should develop their curriculum plan in consultation with the faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website <http://bio.nmsu.edu/grads/>.

Graduate students may also earn a minor in other graduate departments and programs.

Biotechnology Program

This is an accelerated (one year) non-thesis Master of Science degree in Biology that focuses on biotechnology. The program requires 30 hours of course work. The courses in this program are designed to prepare students for biotechnology-related careers in basic and applied research; in product development and testing; and in policy-making, regulation and law enforcement. The program of study includes practical training in molecular biology, genomics and bioinformatics, statistical analysis, business, bioethics and professional development skills. Additional graduate course work will provide students with further expertise in their individual areas of interest, including cell, molecular, and microbial biology; environmental, ecological and evolutionary biology; and general and integrative biology. Students who complete this training will be prepared for successful employment in academic, corporate, and government settings.

Prefix	Title	Credits
Skills		9-10
BIOL 450	Special Topics (Molecular Biology Techniques Lab)	
BIOL 566 or GENE 452	Advanced Bioinformatics and NCBI Database Applied Bioinformatics	
BIOL 562	Advanced Genomics Technology	
A ST 505	Statistical Inference I	
Professional Development		5-7
BIOL 540	Science and Ethics	
BIOL 541	Professional Development Seminar	
MGMT 591	Seminar in Entrepreneurship (or approved substitute)	
Biological Knowledge Electives ¹		14-16
Optional Internship ²		3-6

¹ Students are expected to choose 5 or more courses numbered 450 or above in microbiology, organismal and cellular biology, genetics, or ecology.

² This may include a research internship in a biotechnology company or in a Biology Department laboratory. Credits earned during an internship count towards the required elective credits.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin

working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to a faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
BIOL 450	Special Topics	1-3
BIOL 455	Biometry	3
BIOL 459	Darwinism Versus Creationism	3
BIOL 467	Evolution	3
BIOL 474	Immunology	3
BIOL 475	Virology	3
BIOL 479	Medical Microbiology	3
BIOL 490	Neurobiology	3

Business Administration - Master of Business Administration

The Master of Business Administration (MBA) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The business and accounting programs at NMSU, including the MBA program, are accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

The MBA program is offered in a traditional classroom with some online delivery and in a cohort-based distance program with a synchronous online component.

Details are available at <http://business.nmsu.edu/mba> (<https://business.nmsu.edu/degree-programs/graduate-programs/masters-programs/mba1/>).

Admissions

Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to the MBA program. To be considered for admission to the MBA program, applicants must meet one of the following criteria:

1. Have an undergraduate degree with a GPA of at least 3.0 from a regionally accredited U.S. College or University; or
2. Have achieved a minimum Graduate Management Admission Test (GMAT) score of 400 and a combined GMAT score and undergraduate GPA such that $(\text{GPA} \times 200) + \text{GMAT}$ is greater than or equal to 1050; or
3. Have a graduate degree from a regionally accredited U.S. college or university; or
4. Have a Professional Certification in one of the following: Certified Public Accountant (CPA), Certified Management Account (CMA), Chartered Financial Analyst (CFA), Certified Financial Planner (CFP), or Project Management Professional (PMP) with an official copy of the certificate; or
5. Have completed at least five years of relevant, full-time, post-degree, professional work experience with an undergraduate GPA of at least 2.50 from a regionally accredited U.S. college or university.

As an alternative to the GMAT, students may submit a GRE score which can be converted to the equivalent GMAT score. (Information about the GMAT can be found at www.mba.com.) If a GMAT score is required, the official score must be submitted to the MBA Program Office at least one month prior to initial enrollment in the program. GRE scores are sent directly to the NMSU Graduate School.

A maximum of 9 credit hours of the required MBA courses may be completed prior to the student's acceptance into the MBA degree program.

Note: Regardless of the pathway to admission, all students must have an undergraduate degree and complete the Background Knowledge courses with a grade of "B" or better in each course.

Background Knowledge

Although the MBA program is designed to encourage participation by students with a variety of educational backgrounds, the curriculum is fast paced. As a consequence, a minimum level of background knowledge is expected of all entering students, and those who lack the necessary background in any of the knowledge areas will be required to make up their deficiencies early in the program. Students may complete no more than 9 credits of required MBA courses prior to completion of the background knowledge courses.

Background knowledge may be demonstrated by successful completion (with a grade of A or B) of undergraduate courses in managerial accounting, financial accounting, macroeconomics, finance, statistics and calculus. At NMSU, the relevant courses are

Prefix	Title	Credits
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
ECON 2110G	Macroeconomic Principles	3
BFIN 341	Financial Analysis and Markets	3

MATH 1430G	Applications of Calculus I	3
Choose one from the following:		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	

As an alternative to the three-credit courses above, students may take one-credit courses in the summer to satisfy the background knowledge requirements. These courses are ACCT 500 Concepts in Accounting, B A 500 Macroeconomic Essentials, B A 501 Quantitative Tools for the MBA, and BFIN 500 Concepts in Finance. For more information on these intensive summer courses contact the MBA Office.

Program Requirements (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements. Eleven are required courses:

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 512	Quantitative Analysis for Business Decisions	3
MGMT 590	Strategic Management	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course ¹		3
Total Credits		36

¹ This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written

justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (<https://catalogs.nmsu.edu/search/?P=B%20A%20599>) Master's Thesis in lieu of B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

Concentrations: Students in the on-campus MBA program may elect to pursue one of several MBA concentrations:

- Agribusiness (p. 108)
- Finance (p. 110)
- Health Services Management (p. 111)
- Information Systems (p. 113)
- Public Utility Regulation (p. 114)

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and

may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.
- Students may participate in this program if they have complete the background knowledge prerequisite courses with grades of **B or higher**: ACCT 2110 Principles of Accounting I, ACCT 2120 Principles of Accounting II, ECON 2110G Macroeconomic Principles, BFIN 341 Financial Analysis and Markets, MATH 1430G Applications of Calculus I, MATH 1350G Introduction to Statistics.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives.¹

¹ Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprogram@nmsu.edu or 575-646-8003.

Business Administration (Agribusiness) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements (p. 106). Eleven are required courses:

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 512	Quantitative Analysis for Business Decisions	3
MGMT 590	Strategic Management	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course ¹		3
Total Credits		36

¹ This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (<https://catalogs.nmsu.edu/search/?P=B%20A%20599>) Master's Thesis in lieu of B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Agribusiness and must take the following set of five AEEC courses in substitution of four courses included in the above list of required MBA courses.

Prefix	Title	Credits
AEEC 511	Advanced Derivative Markets	3
AEEC 520	International Agricultural Trade Theory and Policy	3
AEEC 590	Special Topics (Global Food Supply Chain Management)	3
AEEC 551	Advanced Agribusiness Marketing	3
AEEC 556	Advanced Agribusiness Management	3
Total Credits		15

The five AEEC courses collectively substitute for the following five required MBA courses:

Prefix	Title	Credits
ECON 503	Managerial Economics	3
MGMT 502	Operations Management	3
MGMT 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
Elective course (from the approved list)		3
Total Credits		15

Students in the concentration in Agribusiness who have not previously taken a course in Agricultural Policy will be required to take AEEC 545

Advanced Agricultural Policy prior to taking the five concentration courses.

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.
- Students may participate in this program if they have complete the background knowledge prerequisite courses with grades of **B or higher**: ACCT 2110 Principles of Accounting I, ACCT 2120 Principles of Accounting II, ECON 2110G Macroeconomic Principles, BFIN 341 Financial Analysis and Markets, MATH 1430G Applications of Calculus I, MATH 1350G Introduction to Statistics.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. ¹

¹ Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprogram@nmsu.edu or 575-646-8003.

Business Administration (Finance) - Master of Business Administration Program Requirements (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements (p. 106). Eleven are required courses:

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 512	Quantitative Analysis for Business Decisions	3
MGMT 590	Strategic Management	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course ¹		3
Total Credits		36

¹ This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

- B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
- MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree: A student may satisfy the Graduate School's requirement for a final exam by completing the General

MBA Degree's necessary coursework and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (<https://catalogs.nmsu.edu/search/?P=B%20A%20599>) Master's Thesis in lieu of B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Finance. To fulfill this concentration, a student must take BFIN 535 and three additional 500-level BFIN courses (excluding BFIN 503 which is a required course for the General MBA) for a total of 12 credits. These courses can be used as substitutes for MGMT 512 (<https://catalogs.nmsu.edu/search/?P=MGMT%20512>) Quantitative Analysis for Business Decisions and B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.

- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.
- Students may participate in this program if they have complete the background knowledge prerequisite courses with grades of **B or higher**: ACCT 2110 Principles of Accounting I, ACCT 2120 Principles of Accounting II, ECON 2110G Macroeconomic Principles, BFIN 341 Financial Analysis and Markets, MATH 1430G Applications of Calculus I, MATH 1350G Introduction to Statistics.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. ¹

¹ Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprogram@nmsu.edu or 575-646-8003.

Business Administration (Health Services Management) - Master of Business Administration

Program Requirements (42 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements (p. 106). Eleven are required courses:

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3

MGMT 512	Quantitative Analysis for Business Decisions	3
MGMT 590	Strategic Management	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective Course ¹		3
Total Credits		36

¹ This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 (<https://catalogs.nmsu.edu/search/?P=ACCT%20503>) Accounting for Managers, BLAW 502 (<https://catalogs.nmsu.edu/search/?P=BLAW%20502>) Legal Environment of Business, BFIN 503 (<https://catalogs.nmsu.edu/search/?P=BFIN%20503>) Financial Management and MKTG 503 (<https://catalogs.nmsu.edu/search/?P=MKTG%20503>) Marketing Management must be completed prior to enrollment in B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.
2. MGMT 590 (<https://catalogs.nmsu.edu/search/?P=MGMT%20590>) Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 (<https://catalogs.nmsu.edu/search/?P=MGMT%20590>) Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree: A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

- (1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

- (2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (<https://catalogs.nmsu.edu/search/?P=B%20A%20599>) Master's Thesis in lieu of B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

MBA students who want to have a concentration in Health Services Management must complete the following three Public Health courses (one of which fulfills the MBA elective requirement). For the Health Services Management Concentration, B A 590 Professional Paper/Presentation (required of all MBA students) will include a health services management project.

Prefix	Title	Credits
Required Courses		
PHLS 5320	Health Services Organization and Delivery	3
PHLS 5340	Public Health Law and Ethics	3
PHLS 5820	Health Informatics	3
B A 590	Professional Paper/Presentation (credits will count for the MBA standard requirements as well)	3
Total Credits		12

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.

- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.
- Students may participate in this program if they have complete the background knowledge prerequisite courses with grades of **B or higher**: ACCT 2110 Principles of Accounting I, ACCT 2120 Principles of Accounting II, ECON 2110G Macroeconomic Principles, BFIN 341 Financial Analysis and Markets, MATH 1430G Applications of Calculus I, MATH 1350G Introduction to Statistics.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives.¹

¹ Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprogram@nmsu.edu or 575-646-8003.

Business Administration (Information Systems) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements (p. 106). Eleven are required courses:

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 512	Quantitative Analysis for Business Decisions	3
MGMT 590	Strategic Management	3

MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course ¹		3
Total Credits		36

¹ This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or

MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (<https://catalogs.nmsu.edu/search/?P=B%20A%20599>) Master's Thesis in lieu of B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Information Systems and must take additional coursework beyond that required to complete the MBA degree program. BCIS 502 (<https://catalogs.nmsu.edu/search/?P=BCIS%20502>) Business Information Systems is a required MBA course and a prerequisite for each of the courses in the concentration.

Any of these courses may also be used to fulfill the MBA elective requirement.

Prefix	Title	Credits
Required Courses		
Select four from the following:		12
BCIS 550	Information Systems Analysis and Design	
BCIS 561	Business Analytics I	
BCIS 566	Business Analytics II	
BCIS 575	Database Management Systems	
BCIS 580	E-Commerce Security	
BCIS 582	Management of Information Security	
BCIS 585	Enterprise Resource Planning & Business Processes	
Total Credits		12

Students are encouraged to seek advising from the MBA Office or the Information Systems faculty in making course selections.

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.

- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.
- Students may participate in this program if they have completed the following courses with grades of **B or higher**:

Prefix	Title	Credits
Prerequisite Courses		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
ECON 2110G	Macroeconomic Principles	3
BFIN 341	Financial Analysis and Markets	3
MATH 1430G	Applications of Calculus I	3
MATH 1350G	Introduction to Statistics	3

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives.¹

¹ Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprogram@nmsu.edu or 575-646-8003.

Business Administration (Public Utility Regulations) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses beyond the background knowledge requirements (p. 106). Eleven are required courses:

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3

ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 512	Quantitative Analysis for Business Decisions	3
MGMT 590	Strategic Management	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course ¹		3
Total Credits		36

¹ This elective must be selected from the approved course list on the MBA web page.

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (<https://catalogs.nmsu.edu/search/?P=B%20A%20599>) Master's Thesis in lieu of B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Public Utility Regulation and must take the following courses. One of these courses will serve as the elective in the MBA program and two of the courses will substitute for courses MGMT 512 (<https://catalogs.nmsu.edu/search/?P=MGMT%20512>) and B A 590 (<https://catalogs.nmsu.edu/search/?P=B%20A%20590>) in the standard MBA program (because the learning objectives of the utility regulation courses meet the learning objectives of the two basic MBA courses).

Prefix	Title	Credits
Required Courses		
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		12

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor’s Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.
- Students may participate in this program if they have complete the background knowledge prerequisite courses with grades of **B or higher**: ACCT 2110 Principles of Accounting I, ACCT 2120 Principles of Accounting II, ECON 2110G Macroeconomic Principles, BFIN 341 Financial Analysis and Markets, MATH 1430G Applications of Calculus I, MATH 1350G Introduction to Statistics.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. ¹

¹ Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprogram@nmsu.edu or 575-646-8003.

Chemical Engineering - Master of Science in Chemical Engineering

The program of study leading to the MS consists of 32 credits which includes:

- required CHME core graduate courses (14 credits);
- CHME elective courses numbered 455-589 (3 credits);
- other graduate elective courses (9 credits); and
- thesis as CHME 599 Master’s Thesis (6 credits).

Prefix	Title	Credits
Required Core Courses		
CHME 501	Graduate Thermodynamics for Chemical Engineers	3

CHME 506	Graduate Transport Phenomena(s) (Spring semester course)	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s) (Spring semester course)	3
CHME 594	Professional Communication in Chemical Engineering	2
Electives		
CHME electives (select from CHME 455-CHME 589)		3
Electives ¹		9
Master’s Thesis		
CHME 599	Master’s Thesis (minimum 6 credit hours before the thesis defense)	6
Total Credits		32

¹ Elective courses are intended to supplement the research work of each graduate student. These courses must be numbered 450 or above and must be approved by the thesis advisor.

First Year		
Fall		Credits
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME Elective		3
Credits		9
Spring		
CHME 506	Graduate Transport Phenomena(s)	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 599	Master’s Thesis	1
Credits		9
Second Year		
Fall		
CHME 599	Master’s Thesis	3
Grad Electives		6
Credits		9
Spring		
CHME 599	Master’s Thesis	2
Grad Elective		3
Credits		5
Total Credits		32

Chemical Process Industry - Master of Engineering in Chemical Process Industry

The MECPI is a 30 credit hour coursework and/or project-based degree with flexibility of program design for professionals in the Chemical Process Industry. Proposals for the MECPI may be submitted at <https://chme.nmsu.edu/academics/grad/mecpi-degree-plan-proposal/>. MECPI requirements are as follows:

Prefix	Title	Credits
CHME Coursework		
A minimum of 6 credits of CHME 500+ courses, 6 credits must come from the following:		12
CHME 501	Graduate Thermodynamics for Chemical Engineers	
CHME 506	Graduate Transport Phenomena(s)	
CHME 516	Graduate Numerical Methods in Chemical Engineering	
CHME 542	Graduate Reactor Analysis and Design (s)	
CHME 595, CHME 596, and CHME 597 cannot be used to fulfill this requirement		
Three credits in Industrial Safety Coursework		3
CHME 548	Industrial Safety (Recommended) ¹	
Professional Communications Course		
A minimum of 3 credits in professional communication		3
CHME 594 & CHME 690	Professional Communication in Chemical Engineering and Graduate Seminar (both are recommended) ²	
Open Electives		
Students are expected to take a minimum of 6 credits of electives from any areas such as chemical engineering, other engineering, business, economics, fundamental sciences, environmental sciences, etc., to be consistent with their personal MECPI theme or emphasis.		6
Optional Engineering Project Sequence or CHME Coursework ³		6
CHME 595	Chemical Process Design and Business Analysis	
CHME 596	Chemical Process Industries Research	
CHME 597	Advanced Chemical Process Industry Analysis	
Total Credits		30

¹ CHME 548 Industrial Safety is recommended, though other course options with similar content can be proposed.

² CHME 594 Professional Communication in Chemical Engineering and CHME 690 Graduate Seminar are recommended to fulfill this requirement, but students may propose 500+ level communications courses beyond CHME to fulfill this requirement.

³ Students will define and execute an engineering project through their employer while taking the following 3-semester course sequence (after completion of a minimum of 9 credit hours of CHME coursework toward the MECPI)
MECPI students may replace the project with an additional 6 credit hours of CHME coursework.

Students accepted into the MECPI program may use the online MECPI degree plan proposal form (<https://chme.nmsu.edu/academics/grad/mecpi-degree-plan-proposal/>) to request a tailored curriculum personalized to their individual needs based on their current or planned employment in the chemical process industries.

First Year		
Fall		
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 548	Industrial Safety	3
Credits		9

Spring		
CHME 506	Graduate Transport Phenomena(s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 595	Chemical Process Design and Business Analysis ²	3
CHME 690	Graduate Seminar	1
Credits		9
Second Year		
Fall		
CHME 596	Chemical Process Industries Research ²	1
CHME Elective ¹		3
CHME Elective ¹		3
Credits		7
Spring		
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 597	Advanced Chemical Process Industry Analysis ²	2
Credits		5
Total Credits		30

¹ Students are expected to take a minimum of 6 credits of electives from any areas such as chemical engineering, other engineering, business, economics, fundamental sciences, environmental sciences, etc., to be consistent with their personal MECPI theme or emphasis.

² MECPI students may replace the project (CHME 595 Chemical Process Design and Business Analysis, CHME 596 Chemical Process Industries Research, CHME 597 Advanced Chemical Process Industry Analysis) with an additional 6 credit hours of CHME coursework (CHME 450 and above).

Chemistry - Master of Science

The Master of Science in Chemistry is offered in the major emphasis areas of analytical, inorganic, organic, and physical chemistry, and biochemistry. The M.S. degree can be obtained through either a thesis option or a non-thesis option. Both options require at least 30 credits of course work. The thesis option program is designed to teach students modern approaches to chemistry and biochemistry (courses), experimental methods to problem-solving (research), and communication skills in the discipline (seminars and colloquia). All M.S. candidates are required to complete the courses below. Thesis-option students must also pass a qualifying exam at the end of the first year and a final comprehensive examination which includes a written thesis. Non-thesis option students must pass a final exam, the format and content of which will be decided by a departmental committee.

Prefix	Title	Credits
Required Courses		
CHEM 475	Central Concepts in Chemistry - Safety	1
CHEM 476	Central Concepts in Chemistry - Research Ethics	1
CHEM 477	Central Concepts in Chemistry - Professional Development (Required Courses)	1
CHEM 501	Central Concepts in Chemistry - Energy	3
CHEM 502	Central Concepts in Chemistry - Structure	3
CHEM 503	Central Concepts in Chemistry - Dynamics	3
CHEM 504	Central Concepts in Chemistry - Measurements	3
CHEM 510	Graduate Student Seminar ¹	3

CHEM 600	Research ²	9
<i>Additional Graduate-level courses³</i>		3-12
Total Credits		30-39

¹ Only 3 credits of CHEM 510 will count toward the M.S. degree. For the thesis option, at least one credit of CHEM 510 must be taken for a letter grade of B- or better. The remaining CHEM 510 credits for the thesis option and all credits for the non-thesis option may be taken as S/U.

² Required only for thesis-option.

³ Additional courses are chosen based on major emphasis area, through consultation with the thesis committee or an advisor and can include research credits.

Civil Engineering - Master of Engineering in Civil Engineering

The Master of Engineering degree in Civil Engineering (M.E. in CE) is a coursework only degree and several courses are offered online. The M.E. in CE degree requires a total of 30-31 credit hours consisting of one general elective course (3 credit hours); seven technical electives in Civil, Environmental, and/or Agricultural Engineering (21-22 credit hours); and two electives from engineering disciplines outside the department and/or other areas of interest outside the college (6 credit hours).

Prefix	Title	Credits
General elective course		3
C E 490	Introduction to Artificial Intelligence for Civil Engineers ¹	
C E 510	Introduction to Nondestructive Testing ¹	
C E 514	Numerical Methods in Civil Engineering ¹	
C E 535	Technical Communication for Engineers ¹	
CE, ENVE, and A EN elective courses²		21-22
Seven courses to be selected from the following list of courses (numbered 450-599) ³		
<i>Environmental Engineering</i>		
ENVE 456	Environmental Engineering Design	
ENVE 459	Environmental Microbiology ¹	
ENVE 487	Air Pollution Control Systems Design ¹	
ENVE 550	Aquatic Chemistry ¹	
ENVE 551	Unit Processes/Operation of Water Treatment ¹	
ENVE 552	Unit Processes/Operation of Wastewater Treatment ¹	
ENVE 557	Surface Water Quality Modeling ¹	
<i>Geotechnical Engineering</i>		
C E 457	Foundation Design	
C E 460	Site Investigation	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design ¹	
C E 485	Design of Earth Dams	
C E 506	Advanced Soil Mechanics	
C E 507	Design of Earth Retaining Structures ¹	
C E 508	Advanced Soil Behavior	
C E 509	Deep Foundations ¹	
C E 579	Ground Improvement ¹	
C E 585	Slope Stability Analysis and Design	
<i>Structural Engineering</i>		
C E 469	Structural Systems	

C E 501	Advanced Mechanics of Materials ¹
C E 502	Advanced Mechanics of Steel Structures ¹
C E 515	Finite Element Methods ¹
C E 544	Advanced Design of Steel Structures ¹
C E 545	Advanced Concrete Design ¹
C E 554	Wood Design ¹
C E 555	Masonry Design
C E 547	Bridge Engineering
C E 571	Structural Dynamics ¹
C E 572	Earthquake Engineering
Water Resources and Agricultural Engineering	
C E 452	Geohydrology ¹
C E 482	Hydraulic Structures
C E 483	Surface Water Hydrology
C E 531	Open Channel Hydraulics
C E 557	Water Resources Development ¹
C E 581	Ground Water Hydrology ¹
C E 582	Statistical Hydrology
A EN 459	Groundwater, Wells & Pumps
A EN 478	Irrigation and Drainage Engineering
Transportation and Construction	
C E 471	Transportation Engineering ¹
C E 477	Engineering Economics and Construction Management ¹
MECE elective courses ⁴	
6	
Two courses to be selected from the following list of courses (numbered 450-599) ³	
Chemical and Materials Engineering	
CHME 479	Corrosion and Degradation of Materials
CHME 567	Nanoscience and Nanotechnology ¹
Engineering Technology	
ET 454	Advanced Construction Technology
ET 455	Cost Estimating and Scheduling
ET 472	Intelligent Transportation Systems (ITS) ¹
ET 480	Innovation and Product Development
SUR 451	Spatial Data Adjustment II
SUR 452	Spatial Data Integration and Analysis
SUR 461	GNSS Positioning
SUR 464	Legal Principles and Boundary Law II
SUR 485	Emerging Techniques in Geospatial Technologies
Industrial Engineering	
IE 459	Systems Thinking and Decision Making ¹
IE 515	Stochastic Processes Modeling ¹
IE 523	Advanced Engineering Economy ¹
IE 533	Linear Programming ¹
IE 534	Nonlinear Programming ¹
IE 535	Discrete Optimization ¹
IE 537	Large Scale Systems Engineering ¹
IE 561	Advanced Safety Engineering ¹
IE 563	Topics in Engineering Administration ¹
Mechanical Engineering	
ME 456	Experimental Modal Analysis
ME 502	Elasticity I ¹
ME 504	Continuum Mechanics ¹
ME 530	Intermediate Fluid Mechanics

M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
M E 557	Engineering Failure Analysis ¹	
M E 570	Engineering Analysis I ¹	
M E 580	Engineering Analysis II	
Total Credits		30-31

¹ Course offered online in the Fall, Spring, or Summer semester

² Electives should be chosen from at least 2 different areas (e.g., geotechnical and structural, environmental and water resources/agricultural)

³ Up to 12 credit hours of undergraduate courses numbered 450-499 may be applied towards the M.E. in CE degree (excess of this limit requires approval of department head)

⁴ Courses listed represent only a partial list of engineering electives that may be taken outside the department; courses in other areas of interest outside the college may be taken including, but not limited to, environmental science, mathematics, statistics, geography, soil science, geology, business, economics, and management (all M.E. in CE electives must be approved by graduate advisor and department head)

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an CE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the CE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
C E 452	Geohydrology	3-4
C E 457	Foundation Design	3
C E 479	Pavement Analysis and Design	3

C E 483	Surface Water Hydrology	3
C E 510	Introduction to Nondestructive Testing	3
ENVE 451	Unit Processes/Operation of Water Treatment	3

NOTE: No more than 4 courses from the list above can be applied in the MAP for the Master of Engineering in Civil Engineering (MECE) degree.

Civil Engineering - Master of Science in Civil Engineering

In support of the mission and vision statements for the graduate program, the department adopts the following goals for the Master of Science (M.S.) in Civil Engineering degree:

1. Prepare students to fulfill the academic prerequisites specified by the Americans Society of Civil Engineers (ASCE) for Licensure and Professional Practice in Civil Engineering.
2. Prepare students to attain the Body of Knowledge specified by ASCE necessary for entry into the practice of civil engineering at the professional level.
3. Prepare students in conducting applied research in areas relevant to the practice of civil engineering.
4. Prepare students for advanced graduate studies towards a terminal degree.

Students may choose from the geotechnical, structural, or water resources engineering options following the Thesis or Non-Thesis track, requirements of which are specified below. Exceptions to these requirements must be approved by the head of the department. Further information related to the M.S. degree may be found under the Academic Programs of Study (p. 31) section of the catalog.

Option: Geotechnical Engineering Thesis Track

Prefix	Title	Credits
Background Courses ⁴		
C E 357	Soil Mechanics	
C E 457	Foundation Design	
GEOL 1110G	Physical Geology (or higher-level courses)	
C E 445	Reinforced Concrete Design (or higher-level courses based on ACI)	
Core Courses ¹		9
Select three from the following:		
C E 506	Advanced Soil Mechanics	
C E 508	Advanced Soil Behavior	
C E 509	Deep Foundations	
C E 579	Ground Improvement	
Optional Courses		12-13
Select four from the following:		
C E 452	Geohydrology	
C E 460	Site Investigation	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design	
C E 485	Design of Earth Dams	
C E 507	Design of Earth Retaining Structures	
C E 585	Slope Stability Analysis and Design	

Select 3 credits from courses outside the area or department (450 or higher) ²		3
Research Credits		6
C E 599	Master's Thesis ³	
Total Credits		30-31

- ¹ A course listed as core may be taken as one of the four optional courses if it is not counted already as one of the three core courses.
- ² The selected course outside the area or department must be previously approved by the academic advisor or student's Graduate Committee.
- ³ A maximum of 6 credits are counted toward the Master's Degree program.
- ⁴ A course listed as background provides fundamental knowledge to pursue graduate studies in geotechnical engineering but does not satisfy the course requirements for the MS degree (exception: CE 457).

Total credits needed for the Thesis Track are 24 credits of coursework and 6 credits of C E 599 Master's Thesis research.

Non-Thesis Track

The background and core courses for the Non-Thesis Track in Geotechnical Engineering are the same as those listed under the Thesis Track. Under optional courses, Non-Thesis students must select one additional course (i.e., total of five optional courses) from the list provided for the Thesis Track. In addition, Non-Thesis students must complete 3 credits of CE 598 - Special Research Programs in place of 6 credits of CE 599 and pass a final exit exam covering coursework and their research project.

Total credits needed for the Non-Thesis Track are 27 credits of coursework and 3 credits of C E 598 Special Research Programs.

Option: Structural Engineering Thesis Track

Prefix	Title	Credits
Background Courses ²		
C E 315	Structural Analysis	
C E 444	Elements of Steel Design (based on AISC)	
C E 445	Reinforced Concrete Design (based on ACI)	
Core Courses		15
C E 501	Advanced Mechanics of Materials	
C E 515	Finite Element Methods	
C E 544	Advanced Design of Steel Structures	
C E 545	Advanced Concrete Design	
C E 571	Structural Dynamics	
Optional Courses ³		9
Select three from the following:		
C E 490	Introduction to Artificial Intelligence for Civil Engineers	
C E 502	Advanced Mechanics of Steel Structures	
C E 504	Advanced Engineering Design	
C E 507	Design of Earth Retaining Structures	
C E 509	Deep Foundations	
C E 510	Introduction to Nondestructive Testing	
C E 547	Bridge Engineering	
C E 554	Wood Design	
C E 555	Masonry Design	
C E 572	Earthquake Engineering	

C E 590	Advanced Artificial Intelligence for Civil Engineers	
C E 615	Advanced Finite Element Methods	
Research Credits		6
C E 599	Master's Thesis ¹	
Total Credits		30

- ¹ A maximum of 6 credits are counted toward the Master's Degree program.
- ² A course listed as background provides fundamental knowledge to pursue graduate studies in structural engineering but does not satisfy the course requirements for the MS degree.
- ³ A course listed as optional may replace one of the five core courses if it is not counted already as one of the three optional courses (requires department head approval)

Total credits needed for the Thesis Track are 24 credits of coursework and 6 credits of C E 599 Master's Thesis research.

Non-Thesis Track

The background and core courses for the Non-Thesis Track in Structural Engineering are the same as those listed under the Thesis Track. Under optional courses, Non-Thesis students must select one additional course (i.e., total of four optional courses) from the list provided for the Thesis Track. In addition, Non-Thesis students must complete 3 credits of CE 598 - Special Research Programs in place of 6 credits of CE 599 and pass a final exit exam covering coursework and their research project.

Total credits needed for the Non-Thesis Track are 27 credits of coursework and 3 credits of C E 598 Special Research Programs.

Option: Water Resources Engineering Thesis Track

Prefix	Title	Credits
Requirements		
Core courses		12
Statistics		3
Area of Interest Courses		9
C E 599	Master's Thesis	6
Total Credits		30

Non-Thesis Track

Prefix	Title	Credits
Requirements		
Core courses		12
Statistics		3
Area of Interest Courses		15
Total Credits		30

Foundation Requirements

1. ABET- Accredited BS in Civil, Agricultural, Geological Engineering, or closely related field or equivalent (as per existing Civil Engineering Department regulations)
2. One course in surface water hydrology
3. One course in hydrogeology or geohydrology
4. At least three semesters of hydraulics and hydraulic design

Core Courses

Prefix	Title	Credits
Core Courses		12
C E 531	Open Channel Hydraulics	
C E 557	Water Resources Development	
C E 581	Ground Water Hydrology	
C E 582	Statistical Hydrology	
Statistics		3
A ST 505	Statistical Inference I (or advanced statistics class if student is qualified)	
Total Credits		15

Area of Interest Courses (Flexible)

Agricultural/ Civil/ Environmental Engineering

Prefix	Title	Credits
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
C E 452	Geohydrology	
C E 482	Hydraulic Structures	
C E 483	Surface Water Hydrology	
C E 485	Design of Earth Dams	
C E 503	Special Design and Analysis Program	
C E 504	Advanced Engineering Design	
C E 682	Topics in Hydrodynamics II	
ENVE 557	Surface Water Quality Modeling	
ENVE 630	Fate and Transport of Environmental Contaminants	
GEOG 581	System Design for Geographic Information Science (GIS)	
SOIL 652	Advanced Soil Physics	

Modeling/ Fluid Mechanics

Prefix	Title	Credits
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
M E 580	Engineering Analysis II	

Management/Optimization

Prefix	Title	Credits
I E 533	Linear Programming	
I E 534	Nonlinear Programming	
I E 535	Discrete Optimization	

Institutional Aspects

Prefix	Title	Credits
BLAW 527	Negotiation and Business Dispute Resolution	

Electives outside College of Engineering: A ST, AEEC, GEOG, GEOL, MATH, STAT, and SOIL (must be approved by the Advisor and Committee Members).

Notes:

1. International students must be registered at least 9 credits per semester.
2. International students may be required to take English language courses to show proficiency in English.

3. At least half of the credits of the Master's Degree program must be 500 level or higher.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an CE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the CE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
C E 452	Geohydrology	3-4
C E 457	Foundation Design	3
C E 479	Pavement Analysis and Design	3
C E 483	Surface Water Hydrology	3
C E 510	Introduction to Nondestructive Testing	3
ENVE 451	Unit Processes/Operation of Water Treatment	3

NOTE: No more than 2 courses from the list above can be applied in the MAP for the Master of Science in Civil Engineering (MSCE) degree.

Clinical Mental Health Counseling - Master of Arts

The CEP department offers a Clinical Mental Health Counseling program which leads to a Masters of Arts degree (M.A.). The program is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). It prepares professional counselors to perform mental health counseling in agencies, hospitals, and private practice. Successful completion of the Clinical Mental Health Counseling

program qualifies students to pursue licensure as clinical mental health counselors with the New Mexico Counseling and Therapy Practice Board.

Annual application deadline: February 1

For more information on program application requirements and process, see Clinical Mental Health Counseling, M.A., program website (<https://cep.nmsu.edu/academic-programs/counseling-guidance-m-a.html>).

Requirements

The 60-credit counseling curriculum requires two years full-time study or three years part time study on campus, and covers the following areas:

human development; appraisal; diagnosis and treatment planning; individual, family and group counseling; consultation; career/life planning; research; and professional issues. Specialized training and supervised experience is offered in mental health agencies, hospitals, and in schools.

Program of Study

Prefix	Title	Credits
CEPY 5120	Human Development	3
CEPY 5130	Multicultural Counseling	3
CEPY 5170	Professional Issues in Mental Health Counseling	3
CEPY 5180	Addictions Counseling	3
CEPY 5210	Research Methods	3
CEPY 5220	Testing, Assessment, and Psychometric Theory	3
CEPY 5230	Counseling Theory and Technique	3
CEPY 5240	Child and Adolescent Counseling Theory and Technique	3
CEPY 5250	Family Therapy Theory and Technique	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 5270	Diagnosis and Treatment Planning	3
CEPY 5320	Career/Life Planning and Vocational Assessment	3
CEPY 5985	Counseling Practicum	3
CEPY 5998	Counseling Internship	12
Elective Classes		6
CEPY 5280	Primary Care Psychology	3
Total Credits		60

Communication Disorders - Master of Arts

Students entering the graduate program with an undergraduate major in Communication Disorders can expect to complete the program in two years and be awarded a Masters of Arts in Communication Disorders with a specialization in Speech-Language Pathology. The graduate program for students without a Communication Disorders background is generally one year longer because one year of leveling is required. Enrollment in graduate courses in Communication Disorders is limited to students who have been accepted into the graduate program in Communication Disorders. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria which are aligned with the requirements of state and national certifying bodies for licensure and clinical certification. Details regarding certification are available from the American Speech-Language-Hearing Association (<http://www.asha.org/certification/>) (ASHA), and the New Mexico

Regulations & Licensing Department (http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispersing_practices.aspx).

The Master of Arts education program in speech-language pathology at New Mexico State University is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association (ASHA), 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700.

Program Requirements

The traditional Master's degree plan requires a minimum of 62 graduate credit hours and the completion of at least 400 clinical hours.

Prefix	Title	Credits
<i>Elective Course</i>		
SPHS 5110	Research Methods	3
SPHS 5120	Assessment of Communication Disorders	3
SPHS 5130	Pediatric Language and Disorders	3
SPHS 5210	School Age Language and Disorders	3
SPHS 5140	Speech Sound Disorders	3
SPHS 5988	Clinical Education	2
SPHS 5990	Practicum in Speech-Language Pathology	13
SPHS 5220	Adult Neurogenic Language Disorders	3
SPHS 5350	Voice Disorders/Head and Neck Anomalies	3
SPHS 5230	Fluency Disorders	3
SPHS 5330	Dysphagia	3
SPHS 5340	Motor Speech Disorders	3
SPHS 5410	Professional Issues and Multicultural Practices in Communication Disorders	3
SPHS 5989	Externship in Communication Disorders	9
Choose one from the following:		3
SPHS 5320	Cognitive Communication Disorders	
SPHS 5310	Introduction to Augmentative and Alternative Communication	
SPHS 5996	Special Topics	
Total Credits		60

Leveling Program

The Leveling Program is designed for students with an undergraduate degree other than Communication Disorders. The courses to be taken during the leveling year are listed below. In addition to these courses, students who did not complete at least one 3 credit hour course in all of the following subjects: Biology, Physics or Chemistry, and Statistics prior to starting the leveling program, should plan on completing these courses as well.

Prefix	Title	Credits
SPHS 4710	Speech Disorders Across the Lifespan	3
SPHS 4520	Audiology	3
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	3
SPHS 4810	Clinical Methods and Procedures	3
SPHS 4820	Neural Bases of Communication Disorders	3
SPHS 4830	Aural Rehabilitation	3
SPHS 4620	Speech and Hearing Science	3
SPHS 4610	Language Acquisition	3
SPHS 4715	Language Disorders Across the Life Span	3

SPHS 323	Phonetics	3
Total Credits		30

Communication Studies - Master of Arts

The department offers thesis, comprehensive exam, and applied project options in its Masters of Arts program. All options require a minimum of 36 credits, which includes not only Communication Studies courses but at least one course from outside the department. The thesis option requires at least 30 credits of coursework, 6 credits of thesis hours (COMM 599 Master's Thesis), and an oral defense of the thesis and coursework. The comprehensive exam option requires 36 credits of coursework, plus six hours of written examination, followed by an oral defense. The applied project option requires at least 30 credits of coursework, 6 credits of project hours (**COMM 598 MA Project**) and an oral defense of the project and coursework. All options require a minimum of 30 credit hours of Communication Studies courses.

Select 15 credits from Communication Studies electives for the thesis option. Take 15 credits plus at least 3 credits from related disciplines for the comprehensive exam option. Two courses (6 credits) for courses that have numbers 450+ can be counted. For all options, a total of 36 credits is required, 30 credits of COMM, a B- or better in all courses, and a minimum 3.0 GPA to graduate.

An M.A. Tracking Form for thesis, comprehensive exam, and applied project options are found on the department website (<https://comm.nmsu.edu/about-comm-studies/>).

Graduate course rotation:

Fall

COMM 540 Seminar in Political communication

COMM 570 Seminar in Organizational Communication

COMM 583 Seminar in Theories of Communication

Spring

COMM 505 Research Methods/COMM 506 Qualitative Research Methods in Communication

COMM 576 Seminar on Communication and Culture

COMM 584 Seminar in Interpersonal Communication

Thesis Option:

Prefix	Title	Credits
Degree Requirements		
COMM 505	Research Methods ¹	3
or COMM 506	Qualitative Research Methods in Communication	
COMM 583	Seminar in Theories of Communication	3
Select three courses from the following:		9
COMM 540	Seminar in Political communication	
COMM 570	Seminar in Organizational Communication	
COMM 576	Seminar on Communication and Culture	
COMM 584	Seminar in Interpersonal Communication	
Electives ²		
Select 9-12 credits of COMM Electives		9-12

Select 3-6 credits must be from courses in Related Fields (outside of COMM courses and must be numbered 450+)

Thesis		
COMM 599	Master's Thesis	6
Total Credits		36

¹ Students must receive a minimum grade of a B or better in the methods course for which they wish to apply to their thesis work. Approval of the students thesis advisor may also be required.

² In order to graduate, students will need a total of 36 credits, of which 30 credits must be from COMM coursework. Please consult your advisor about your specific requirements and how to complete them in order to graduate.

Comprehensive Exam Option:

Prefix	Title	Credits
Degree Requirements		
COMM 505	Research Methods	3
or COMM 506	Qualitative Research Methods in Communication	
COMM 583	Seminar in Theories of Communication	3
Select three courses from the following:		9
COMM 540	Seminar in Political communication	
COMM 570	Seminar in Organizational Communication	
COMM 576	Seminar on Communication and Culture	
COMM 584	Seminar in Interpersonal Communication	
Electives ¹		
Select 15-18 credits from COMM Electives		15-18
Select 3-6 credits must be from courses in Related Fields (outside of COMM courses and must be numbered 450+)		3-6
Total Credits		36

¹ In order to graduate, students will need a total of 36 credits, of which 30 credits must be from COMM coursework. Please consult your advisor about your specific requirements and how to complete them in order to graduate.

Applied Project Option:

Prefix	Title	Credits
Degree Requirements		
COMM 505	Research Methods	3
or COMM 506	Qualitative Research Methods in Communication	
COMM 583	Seminar in Theories of Communication	3
Select three courses from the following:		9
COMM 540	Seminar in Political communication	
COMM 570	Seminar in Organizational Communication	
COMM 576	Seminar on Communication and Culture	
COMM 584	Seminar in Interpersonal Communication	
Electives ¹		
Select 9-12 credits from Electives in Related Fields, 3-6 credits from (graduate levels; numbered 450+).		9-12
Select 3-6 credits must be from courses in Related Fields (outside of COMM courses and must be numbered 450+)		3-6
Project Option		
COMM 598	MA Project	6
Total Credits		36

¹ In order to graduate, students will need a total of 36 credits, of which 30 credits must be from COMM coursework. Please consult your advisor about your specific requirements and how to complete them in order to graduate.

Entrance Requirements for Graduate Study in Communication Studies

Students wishing to enroll in the Master program in Communication Studies must meet the following criteria:

1. Hold a BA or BS degree, from an accredited institution of higher learning; Social Science disciplines are preferred
2. Hold a minimum grade point average of 3.00

**The Graduate Record Exam (GRE) General Test is not required for admission; however, existing GRE scores that are high will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships.*

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs. The MAP program allows undergraduate students to take graduate courses and count up to twelve credits toward both undergraduate and graduate degrees in COMM.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.25.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
COMM 550	Seminar in Communication Technologies	3
COMM 557	Seminar Strategic Communication	3
COMM 562	Seminar in Family Communication	3
COMM 565	Seminar in Nonverbal Communication	3
COMM 571	Seminar in Sports Communication	3

COMM 595	Communication Internship for Graduate Students	3
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Enrollment in graduate courses requires the approval of the Department Chair and a completed MAP form before the first semester to take MAP courses for dual credit. Please meet with Dr. Armfield for more information.

Computer Science - Master of Science

The Master of Computer Science degree has two tracks, one with thesis or project track and a course-work only track. For all master's students, the following apply:

- Each master's student must complete 12 credits of the basic requirements (p. 125)(see table below).
- Each master's student is expected to register for C S classes numbered 500 or above, except for C S 469 Data Structure and Algorithms Transition or deficiencies which are 46x courses (Transition Courses) or C S 471 Programming Language Structure I or C S 474 Operating Systems I.
- Courses not in Computer Science can be included in the student's program of study only if prior written approval has been obtained from the student's advisor and the departmental Graduate Committee. Further details can be found in the on-line Graduate Handbook (<http://www.cs.nmsu.edu/> (<https://www.cs.nmsu.edu/>)).
- **For Thesis/Project track's students:** each student following this track needs to complete the following three requirements:
 - **Courses:** each student *needs to take*, in addition to the basic requirement, **15 credits** of Computer Science graduate courses (courses numbered > 500) with the following restrictions:
 - One course can only be used to satisfy one requirement (e.g., if C S 510 Automata, Languages, Computability is used to satisfy the requirement for the **Theories** category, it cannot be counted towards satisfying the requirements on **Courses**).
 - At most 6 credits of C S 579 Special Topics with different topics (i.e., with different subtitles) can be counted towards the degree program of the student.
 - At most 6 credits of C S 589 Special Research Problems can be counted towards the degree program of the student.
 - No credit of course numbered > 599 can be counted towards the degree program.
 - **Thesis/Project:** each student *must write a thesis* (C S 599 Master's Thesis) or *undertake a research project* (C S 598 Master's Project) for **6 credits**.
 - **Master Final Exam:** each student *is required to sustain a final exam*, covering the thesis/research project and the graduate course-work. The two parts of the exam bring equal weight.

- **For Course-Work Only track's students:** Each student following this track needs to take, in addition to the basic requirement, **24 credits** of Computer Science graduate courses (courses numbered > 500) with the following restrictions:
 - One course can only be used to satisfy one requirement (e.g., if C S 510 Automata, Languages, Computability is used to satisfy the requirement for the **Theories** category, it cannot be counted towards satisfying the requirements on **Courses**).

- At most 6 credits of C S 579 Special Topics with different topics (i.e., with different subtitles) can be counted towards the degree program of the student.
- No credit of course numbered > 588 can be counted towards the degree program.

Basic Requirements

Prefix	Title	Credits
Basic		3
C S 469	Data Structure and Algorithms Transition	
Theories		3
C S 510	Automata, Languages, Computability	
C S 570	Analysis of Algorithms	
C S 583	Advanced Cryptography	
C S 586	Algorithms in Systems Biology	
Systems		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 582	Database Management Systems II	
C S 584	Computer Networks II	
Applications		3
C S 506	Computer Graphics I	
C S 508	Introduction to Data Mining	
C S 509	Bioinformatics Programming	
C S 513	Computer Security	
C S 514	Introduction to Smart Grids	
C S 515	Human-Centered Computing	
C S 516	Bioinformatics	
C S 517	Digital Game Design	
C S 518	Visual Programming	
C S 519	Applied Machine Learning I	
C S 521	Parallel Programming	
C S 522	Cloud and Edge Computing	
C S 525	Introduction to Cryptography	
C S 531	Principles of Virtual Reality	
C S 532	Modern Web Technologies	
C S 533	Introduction to Deep Learning	
C S 534	Graph Data Mining	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
Total Credits		12

Counseling and Guidance (Educational Diagnostics) - Master of Arts

The CEP Department offers an MA in Counseling and Guidance with a specialization in Educational Diagnostics. Candidates admitted to the Specialist in Education (Ed.S.) or Ph.D. School Psychology Programs will have an opportunity to complete this MA degree prior to the completion of the Ed.S. or Ph.D. degree. Please note that this is not a stand-alone program, only students admitted to the aforementioned programs are considered for this degree. Please refer to the Catalog or the CEP department's website (<http://cep.nmsu.edu/>) for admissions and application requirements.

Prefix	Title	Credits
Required Coursework		
<i>Core Courses</i>		
CEPY 6130	Psychology of Multiculturalism	3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6265	Diagnostic Class	3
CEPY 6120	Human Development	3
SPED 6170	School Intervention and Organization in a Diverse Society	3
<i>Concentration Coursework</i>		
CEPY 5310	Appraisal of Psychoeducational Achievement in a Diverse Society	3
CEPY 6330	Academic & Behavioral Assessment & Intervention	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	3
CEPY 6520	Field Experience in Educational Diagnostics	3
Total Credits		30

Creative Writing - Master of Fine Arts

Students pursuing the MFA in Creative Writing devote themselves to concentrated study and development of a chosen genre: poetry or fiction. Students

- complete 54 hours of graduate-level coursework,
- present a book-length thesis of original work with an introduction or afterward,
- perform a public reading from the thesis, and
- pass an oral examination in the final semester.

A maximum of 12 credits in Form and Technique count for the degree.

Prefix	Title	Credits
Required Coursework ¹		
MFA workshop in the major genre (poetry, fiction)		12
Form and Technique courses in major genre		6
Workshop in a second genre		3
Graduate literature courses (may include 2 Form & Technique)		12
ENGL 592	Master's Theory, Practice, and Profession ²	6
ENGL 594	Master's Workshop ²	6
ENGL 599	Master's Thesis ³	6
Elective Courses		3-12
Total Credits		54-63

¹ Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

² 3 hours of ENGL 592 Master's Theory, Practice, and Profession must be taken concurrently with 3 hours of ENGL 594 Master's Workshop in each of the final two semesters of the program.

³ 3 hours of ENGL 599 Master's Thesis must be taken in the final semester.

Criminal Justice - Master of Criminal Justice

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please

contact the director of the MCJ program or consult the Department of Criminal Justice website (<http://crimjust.nmsu.edu/criminal-justice-graduat/>) for details.

Thesis Option (33 Credits)

Thesis students must submit a thesis proposal to their faculty committee for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination minimally includes a defense of the completed thesis, but may also include a general examination based upon the candidate's program of study. The minimum coursework requirements are displayed below.

Prefix	Title	Credits
Required Courses		15
CJUS 511	Nature of Crime	
CJUS 514	Advanced Race, Crime, and Justice	
CJUS 525	Issues in Ethics, Law, and Criminal Justice	
CJUS 501	Research Methods in Criminal Justice	
or CJUS 555	Advanced Feminist Research Methods	
CJUS 541	Seminar in Criminal Justice Policy Analysis and Planning	
Master's Thesis Credits		
CJUS 599	Master's Thesis	6
General Electives		
Select 12 credits from General Electives. ¹		12
Total Credits		33

¹ Students may not count CJUS 593 Internship or CJUS 592 Independent Research credit toward their elective requirement. No more than three total credits of CJUS 591 Directed Readings in Criminal Justice coursework may be used as electives; a minimum of 3 of the 12 credit general elective requirement must come from the Department of Criminal Justice.

A minor is optional (contact the director of the MCJ program or consult the Department of Criminal Justice web site, <https://crimjust.nmsu.edu/>, for details) and may result in more than 33 total credits for the degree.

Focused Coursework Option (36 Credits)

Focused coursework students must pass a written comprehensive examination following completion of the required courses. Students not passing the examination will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

Prefix	Title	Credits
Required Courses		15
CJUS 511	Nature of Crime	
CJUS 514	Advanced Race, Crime, and Justice	
CJUS 525	Issues in Ethics, Law, and Criminal Justice	
CJUS 501	Research Methods in Criminal Justice	
CJUS 541	Seminar in Criminal Justice Policy Analysis and Planning	

CJus Electives

Select 12 credits from electives from courses offered by the Department of Criminal Justice, to be selected in consultation with a student's advisor. ¹	12
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General Electives/Minor

An additional 9 credits of electives, to be selected in consultation with a student's advisor. ²	9
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Total Credits	36
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¹ No more than three total credits of CJUS 593 Internship or CJUS 591 Directed Readings in Criminal Justice courses may be used as Criminal Justice electives. CJUS 592 Independent Research may not be used as Criminal Justice Electives for this option.

² No more than three credits of C J 593 Internship or C J 591 Directed Readings may be used to fulfill the general elective requirement. C J 592 Independent Research may not be used as Criminal Justice Elective for this option.

A minor is optional (contact the director of the MCJ program or consult the Department of Criminal Justice web site, <https://crimjust.nmsu.edu/>, for details) and may result in more than 36 total credits for the degree.

Minimum Grade Requirement

Students must earn a minimum B- grade in all required core courses, excluding elective credits. This applies to both options: Thesis and Focused Coursework as well as to both programs: On-Campus (traditional) and Online.

Data Analytics - Master of Data Analytics

PMS in Data Analytics (100% Online)

Data analytics is an inherently interdisciplinary discipline, dealing with methods and systems to synthesize knowledge or insights from large quantities of data collected from heterogeneous sources and diverse spatial and time scales. Data analytics employs theories, methodologies, and tools drawn from many fields, within the broad areas of mathematics, statistics, and computer and information sciences, and applies them to a diversity of data-rich domains, such as life sciences, medicine, physical sciences, social sciences, engineering, business, and education.

The PMS in Data Analytics will provide students with a strong foundation in data management and analysis, the computational and statistical thinking, and understanding of computer systems. After completing this program, students will have gained the skills and ability to:

- Analyze real-life data from diverse sources and domains
- Effectively apply analytics tools to large data sets
- Apply mathematical and statistical models to data analysis problems
- Apply computational thinking to develop effective data analytics solutions
- Apply programming and debugging skills to problem solving
- Understand and use computer technology and software in solving real-life data analysis problems
- Understand and address unfamiliar problems related to data analytics
- Develop effective instrument to communicate solutions to diverse audiences

Program

The professional focus of the degree will prepare students for success in the workplace, with an emphasis on enriching the preparation of students who are already in the workplace and are seeking technical skills to advance their careers in the data analytics domain.

Program Features

- Degree granted from New Mexico State University
- Asynchronous courses delivery to accommodate student schedules & needs
- 30 credits [3 semesters and a summer, 9 credits/semester; students may enroll part time]
- In person courses are permissible
- Industry experience encouraged

Affiliated Faculty (Non-Computer Science Faculty)

- Laura Boucheron, PhD, University of California Santa Barbara; Image processing, machine learning and deep learning applied to image analysis, interdisciplinary applications including astronomy and biomedical; Klipsch School of Electrical & Computer Engineering
- Hansuk Sohn, PhD, University of Iowa; Mathematical Programming (Linear, Integer, and Stochastic) and Dynamic Programming, Algorithm development (Optimization, Heuristic, and Hybrid algorithms), Statistical Data Analysis and Data Mining; Industrial Engineering
- Charlotte Gard, PhD, University of Washington; Biostatistics; Department of Economics, Applied Statistics, and International Business
- Clint Loest, PhD, Kansas State University; Ruminant Nutrition, Animal Nutrition; Animal and Range Sciences
- Carlo A. Mora-Monge, PhD, The University of Toledo; Business Analytics, Supply Chain Analytics, E-commerce Use; Management Department
- Marshall A. Taylor, PhD, University of Notre Dame; Computational Social Science, Cultural Sociology, Cognitive Sociology; Department of Sociology

Curriculum

The curriculum for the degree program is composed of 30 graduate credits.

Prefix	Title	Credits
Foundation		
C S 453	Python Programming I	3
or C S 454	Python Programming II	
A ST 511	Statistical Methods for Data Analytics	3
Select one of the following courses		3
C S 458	R Programming I	
A ST 515	Statistical Analysis with R	
Methodologies		
C S 508	Introduction to Data Mining	3
C S 519	Applied Machine Learning I	3
or E E 565	Machine Learning I	
Select one of the following courses		3
C S 502	Database Management Systems I	

BCIS 575	Database Management Systems
ICT 458	Web Development and Database Applications
Advanced Topics and Applications	
Choose nine credits from the following:	
A ST 555	Applied Multivariate Analysis
A ST 616	Computational Statistics
ASTR 630	Advanced Methods in Astrophysics
BIOL 566	Advanced Bioinformatics and NCBI Database
BCIS 566	Business Analytics II
BCIS 585	Enterprise Resource Planning & Business Processes
C S 509	Bioinformatics Programming
C S 516	Bioinformatics
C S 506	Computer Graphics I
or ICT 460	Advanced Software Development Concepts
C S 582	Database Management Systems II
E E 596	Digital Image Processing
ENGL 543	Multimedia Theory and Production
or COMM 550	Seminar in Communication Technologies
I E 545	Characterizing Time-Dependent Engineering Data
or BCIS 561	Business Analytics I
I E 515	Stochastic Processes Modeling
or I E 522	Queueing Systems
I E 567	Design and Implementation of Discrete-Event Simulation
MATH 518	Fourier Series and Boundary Value Problems
or STAT 535	Elementary Stochastic Processes
SOCI 5150	Seminar in Social Networks
SOCI 5155	Seminar in Text Analysis for the Social Sciences
SOCI 5160	Seminar in Data Visualization
Capstone Experience	
Select one of the following courses	
C S 598	Master's Project
MATH 599	Master's Thesis
A ST 598	Special Research Problems
E E 598	Master's Technical Report
I E 599	Master's Thesis
Internship	
Total Credits	

30

Economics - Master of Arts

Economics - Master of Arts (no Concentration)

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 501 Microeconomic Theory, AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500 or above. All students must meet the requirements

specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program.

The Master of Arts in Economics (regulatory economics) may be completed either face-to-face or online

All students in the program must successfully complete a minimum of 30 credits including the following:

Prefix	Title	Credits
Required Courses		
AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
Electives, subject to the restrictions above.		21
Total Credits		30

Notes:

1. *No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.*
2. *ECON 503 Managerial Economics cannot be counted toward the major in Economics.*
3. *A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.*

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not imply or guarantee an assistantship. It is not necessary to have an undergraduate degree in economics to enter the graduate program or to receive financial assistance.

The Masters of Arts in Economics (no concentration) may be completed either face-to-face or online.

Economics (Econometrics) - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 501 Microeconomic Theory, AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500 or above. All students must meet the requirements specified in the general regulations and requirements for admission to

the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Those students interested in the concentration in regulatory economics are advised to complete two courses in college-level statistics.

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not imply or guarantee an assistantship. It is not necessary to have an undergraduate degree in economics to enter the graduate program nor to receive financial assistance.

All students in the program must successfully complete a minimum of 30 credits including the following:

Prefix	Title	Credits
Required Courses		
AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
Electives, subject to the restrictions above.		21
Total Credits		30

Notes:

1. *No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.*
2. *ECON 503 cannot be counted toward the major in Economics.*
3. *A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.*

Prefix	Title	Credits
Additional Required Courses for a Concentration in Econometrics		
AEEC 540	Econometrics I	3
ECON 545	Econometrics II	3
Select 6 graduate credits of A ST (Applied Statistics) at the 500 level ¹		6
Total Credits		12

¹ Excluding A ST 505 Statistical Inference I, independent study, thesis, project and dissertation credits.

Economics (Public Policy) - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 501 Microeconomic Theory, AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits

must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Those students interested in the concentration in regulatory economics are advised to complete two courses in college-level statistics.

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not guarantee an assistantship. It is not necessary to have an undergraduate degree in economics for admission to the graduate program nor to receive financial assistance.

Prefix	Title	Credits
Required Courses		
AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
Electives, subject to the restrictions above.		21
Total Credits		30

Notes:

1. No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.
2. ECON 503 cannot be counted toward the major in Economics.
3. A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.

Prefix	Title	Credits
Additional Required Courses for a Concentration in Public Policy		
AEEC 522	Public Sector Economics I	3
POLS 530	Seminar in Public Policy	3
Select one from the following:		3
POLS 537	Issues in Public Policy	
POLS 540	Seminar in Public Administration	
POLS 541	Public Budgeting	
POLS 544	Public Policy Analysis	
Total Credits		9

Economics (Public Utility Policy and Regulation) - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 501 Microeconomic Theory, AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I) must be earned by taking courses taught by economics faculty members in the Department of Economics,

Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program.

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not imply or guarantee an assistantship. It is not necessary to have an undergraduate degree in economics to be admitted to the graduate program nor to receive financial assistance.

The Masters of Arts in Economics (regulatory economics) may be completed either face-to-face or online.

Prefix	Title	Credits
Required Courses		
AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
Electives, subject to the restrictions above.		21
Total Credits		30

Notes:

1. No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.
2. ECON 503 cannot be counted toward the major in Economics.
3. A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.

Prefix	Title	Credits
Additional Required Courses for a Concentration in Regulatory Economics		
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		12

Education (Bilingual Education) - Master of Arts

The program with a concentration in Bilingual Education (without coursework leading to New Mexico Licensure) prepares scholars,

practitioners and leaders in understanding bilingualism/multilingualism within the contexts of schools, families, communities and society. The Southwest Borderlands situates participants uniquely such that they might critically examine issues confronting Spanish-speaking and heritage language populations. A key dimension of the program is the advancement of issues related to equity and social justice by encouraging participants to serve as advocates for bilingual children, their families and communities.

- Candidates who apply for the Bilingual Education (Spanish/English) endorsement (PreK-12) must successfully demonstrate language proficiency as measured by the Spanish language examination PRUEBA. Similar requirements are necessary for candidates of Bilingual Education for Navajo and Pueblo language groups. These examinations are administered through the New Mexico State Department of Education.
- The necessary coursework required for the Bilingual Education endorsement is embedded within this program of the study. Additional information regarding the endorsement can be found at the New Mexico Public Education Department (<https://webnew.ped.state.nm.us/bureaus/licensure/endorsements-how-to-add-a-license/>)
- Many specialized courses are not offered every semester. Please check with your advisor to plan accordingly

Prefix	Title	Credits
Course Requirements		
<i>TPAL Core Courses</i>		
EDUC 5120	Multicultural Education (also a Bilingual Education Core Course)	3
EDUC 5140	Research in Curriculum and Pedagogy	3
<i>Bilingual Education Core Courses</i>		24
BLED 5130	Issues in Schooling for Bilingual Learners	
EDLT 5130	Technology and Language Learning	
BLED 5210	Literacy-Language Instruction for Bilingual Students	
BLED 5310	Bilingual/Multicultural Schooling and Community Relations	
BLED 5998	Internship in Bilingual Education	
BLED 5420	Pedagogy of TESOL	
BLED 5320	Second Language Acquisition	
BLED 5996	Selected Topics in Bilingual Education	
<i>Electives - choose one</i>		3
BLED 5410	Sociolinguistics in Education	
BLED 5992	Directed Study in Bilingual Education	
Total Credits		33

Education (Curriculum & Instruction) - Master of Arts

Remember You cannot teach in the public schools without seeking a teaching license and you cannot seek an endorsement without first obtaining an initial teaching license.

Non- Licensure

The program with a concentration in Curriculum & Instruction/ Multicultural Education is a 30 credit (minimum) program of study including elective/minor courses (9-12 credits).

Prefix	Title	Credits
Course Requirements		
TPAL Core Courses		
EDUC 5120	Multicultural Education	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
EDUC 5170	Action Research Projects	3
Additional TPAL Courses		9
EDUC 5992	Directed Study Courses in Education	
EDUC 6330	Critical Race Theory & Storytelling in Educational Spaces	
ELAD 5310	Leadership for Social Justice and Equity	9-12
Students select a minor in Native American Studies (9 cr), Gender and Sexuality Studies (9-12 cr), or 9 credits of electives in Criminal Justice		
Total Credits		30-33

¹ This course is the final course that students are required to take after all other courses are completed.

Education (Early Childhood Education) - Master of Arts

Concentration: Early Childhood Education (without licensure)

The program with a concentration in Early Childhood Education (without licensure) is an on-line only graduate degree program for persons with a bachelor's degree in early childhood education or a related field who are already teaching or working in early childhood settings. This advanced degree prepares the early childhood professional for advanced practice in teaching education, engagement with applied research, staff development, work with families, program management and commitment to issues, analysis and advocacy related to early childhood education.

- This is an on-line program only
- You must apply and be admitted to NMSU Graduate School and the School of Teacher Preparation, Administration and Leadership before you can begin taking ECED courses
- Many specialized courses are not offered every semester. Please check with your faculty advisor to plan accordingly
- For additional information, visit the program website (<https://tpal.nmsu.edu/degree-programs/concentrations/eced.html>)

Prefix	Title	Credits
Course Requirements		
<i>TPAL Core Courses</i>		
EDUC 5120	Multicultural Education	3
EDUC 5140	Research in Curriculum and Pedagogy	3
EDUC 5170	Action Research Projects	3
<i>Early Childhood Core Courses</i>		
ECED 5230	Curriculum in Early Childhood Education	3
BLED 5120	The Bilingual Preschool Child	3
ECED 6110	History and Philosophy of Early Childhood Education	3
ECED 5310	Issues in Early Childhood Education	3
ECED 5130	Working with Parents of Young Children	3
ECED 5210	Leadership and Advocacy in Early Childhood	3
ECED 5520	Literacy Development in Early Childhood	3

ECED 5110	Working with Young Children with Special Needs, Ages 3-8	3
Total Credits		33

Education (Early Childhood Education Plus Licensure) - Masters of Arts

Concentration: Early Childhood Education (plus licensure)

The College of Education's School of Teacher Preparation, Administration and Leadership at New Mexico State University offers a 42 credit Master of Arts in Education Plus Licensure in Early Childhood Education for individuals who have completed a bachelor's degree. The program is designed to meet the professional education course requirements for teacher licensure as a part of a Master of Arts in Education degree program. A full-time student in this program typically completes in 2 years.

Eligible Participants must:

- Completed a bachelor's degree in a closely related field with a cumulative GPA of 2.75 or higher.
- Prerequisites may be required depending on BA degree coursework.
- Be admitted to the NMSU Graduate School
- Be admitted to the College of Education's School of Teacher Preparation, Administration and Leadership

Prefix	Title	Credits
Program Requirements		
<i>Core Courses</i>		
EDUC 5120	Multicultural Education ¹	3
EDUC 5140	Research in Curriculum and Pedagogy ¹	3
<i>ECED Licensure Course Work</i>		
ECED 5510	Advanced Teaching and Learning of Literacy	3
ECED 5420	Science/Math Curriculum	3
ECED 5310	Issues in Early Childhood Education	3
ECED 5110	Working with Young Children with Special Needs, Ages 3-8	3
ECED 5410	Seminar on Child Development, Assessment and Well-being of Young Children	3
ECED 5520	Literacy Development in Early Childhood	3
BLED 5120	The Bilingual Preschool Child	3
ECED 5220	Play in the Early Childhood Curriculum	3
ECED 4810	Student Teaching/Seminar Early Childhood	3
SPED 4810	Early Childhood SPED Student Teaching	9
Total Credits		42

¹ Prerequisites to TEP Methods Courses; TEP portfolio can be submitted during the semester in which you are finishing the Core courses.

Education (Elementary Licensure Prep) - Master of Arts

Elementary Licensure Prep

The School of Teacher Education & Educational Leadership at New Mexico State University offers an Elementary Teacher Education Program

for individuals who have completed a bachelor's degree. The program is designed to meet the professional education course requirements for teacher licensure as a part of a Master of Arts in Education degree program.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Program Completion Requirements:

1. Apply through NMSU Graduate School main webpage (<https://gradschool.nmsu.edu/>). Select Intended major "Education (Elementary Licensure Prep)" as this is the concentration you will pursue
2. After you receive an acceptance letter from the Department of Curriculum & Instruction, contact your faculty advisor within the first semester of enrollment
3. Complete the MATH 511 Fundamentals of Elementary Mathematics I prerequisite course
4. Complete the Core Courses listed below, before admission into the Teaching Education Program

Admission to the Teacher Education Program (TEP):

1. Obtain application information at <https://tpal.nmsu.edu/admissions/tep-admission/> (<https://tpal.nmsu.edu/admissions/tep-admission.html>)
2. Make an appointment with the program director for a program of study before TEP portfolio
3. Pass Praxis Core Academic Exams: Reading, Writing, and Math. Information can be found at <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>)
4. Submit TEP portfolio to the College of Education Advising Center no later than 12:00 pm (MST) on the 3rd Friday in February for Spring, the 3rd Friday in September for Fall, or the 3rd Friday in July for Summer. TEP portfolio must be successfully reviewed before enrolling in Teaching Methods Courses.

Completing Teaching Methods Block Courses:

1. Fall Block (see below)
2. Spring Block (see below)
3. Pass Praxis Elementary Education: Curriculum, Instruction, and Assessment before or during Block B <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>)
4. Earn a grade of B or better in all courses

Student Teaching Entry Portfolio (STEP)

1. Obtain application information at <https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html>
2. Make an appointment with the Program Director for a program of study
3. Before student teaching is approved, the Candidate must include passing scores for Praxis Elementary Education: Curriculum, Instruction, and Assessment.

4. Submit Student Teaching Packet (STEP) on the 1st Friday in March for Spring and the 1st Friday in October in Fall.

Student Teaching- must be completed during the final semester

1. Take EDUC 5811 and EDUC 5810 concurrently during student teaching (16-week Student Teaching Internship and Seminar)
2. Pass Praxis Principles of Learning and Teaching: Grade K-6 and Teaching Reading: Elementary exams during student teaching semester <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>)
3. Defend Evidence of Student Learning project during student teaching semester in EDUC 5811

Prefix	Title	Credits
Course List		
<i>TPAL Core Courses</i>		
SPED 5105	Introduction to Special Education in a Diverse Society (TEP Prerequisite)	3
EDUC 5120	Multicultural Education (TEP Prerequisite)	3
EDUC 5110	Exploration in Education (TEP Prerequisite)	3
EDUC 5160	Curriculum and Pedagogy (TEP Prerequisite)	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
<i>Teaching Methods Block Courses</i>		
Fall Block		
READ 5320	Elementary School Literacy II	3
EDUC 5330	Methods of Teaching Elementary School Social Studies	3
Spring Block		
READ 5310	Elementary School Literacy I	3
EDUC 5310	Methods of Teaching Elementary School Science	3
EDUC 5320	Methods of Teaching Elementary School Mathematics	3
<i>Student Teaching Block</i>		
EDUC 5811	Teaching Methods Laboratory	3
EDUC 5810	Student Teaching	6
Total Credits		42

Full-time

All block Fall & Spring must be taken as a block in the same section.

First Year

Fall		Credits
Take Praxis Core Academic Skills. These courses are pre/corequisites for Teacher Education Program (TEP) portfolio submission.		
MATH 511	Fundamentals of Elementary Mathematics I (Prerequisite Course)	
EDUC 5120	Multicultural Education	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
Credits		6
Spring		
Apply to TEP. These courses are pre/corequisites for Teacher Education Program (TEP) portfolio submission.		
EDUC 5110	Exploration in Education	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
Credits		9

Second Year

Fall

Take Elementary Education: Curriculum, Instruction, and Assessment. RDG 5320 and EDUC 5330 require acceptance into TEP.

READ 5320	Elementary School Literacy II	3
EDUC 5330	Methods of Teaching Elementary School Social Studies	3
EDUC 5130	Technology and Pedagogy	3
Credits		9

Spring

Submit STEP Packet. These courses require acceptance into TEP.		
READ 5310	Elementary School Literacy I	3
EDUC 5310	Methods of Teaching Elementary School Science	3
EDUC 5320	Methods of Teaching Elementary School Mathematics	3
Credits		9

Third Year

Fall

Take Principles of Learning and Teaching: Grades K-6 and Teaching Reading: Elementary. These two courses require acceptance into TEP.

EDUC 5811	Teaching Methods Laboratory	3
EDUC 5810	Student Teaching	6
Credits		9
Total Credits		42

Education (Elementary Mathematics and Science) - Master of Arts

The College of Education's School of Teacher Preparation, Administration and Leadership at New Mexico State University offers a 34 credit Master of Arts in Education in Elementary Mathematics and Science for individuals who have completed a Bachelor's degree and already licensed teachers. The program is designed to prepare teachers to be specialists in mathematics and science teaching and learning, and to prepare them to be leaders.

A part-time student enrolling in 6 credit hours per semester, including the summer, will complete this program in 2 years. The program follows a cohort model.

Eligible Participants must:

- Have completed a bachelor's degree in a closely related field with a cumulative GPA of 2.80 or higher
- Be admitted to the NMSU Graduate School
- Be admitted to Curriculum & Instruction

Program Delivery: Main Campus; Face-to-face

Prefix	Title	Credits
Program Requirements		
<i>Core Courses</i>		
EDUC 5120	Multicultural Education	3
EDUC 5140	Research in Curriculum and Pedagogy	3
<i>Elementary Mathematics and Science Course Work (28 credits)</i>		
EDUC 5520	Elementary Mathematics Development I	3
MATH 568	Using Number Throughout the Curriculum	3
EDUC 5530	Elementary Mathematics Development 2	3

MATH 564	From Number to Algebra	3
E T 481	Engineering Principles for Elementary Teachers	3
BIOL 565	Biology In The K-6 Curriculum	3
MATH 567	From Measurement to Geometry	3
EDUC 5510	Elementary Science Development	3
EDUC 5540	Leadership Advocacy in Elementary Mathematics and Science	3
EDUC 5999	Capstone Research Project	1
Total Credits		34

Observations of teaching, technology, and multicultural education are integrated into all coursework.

Education (Language, Literacy, & Culture) - Master of Arts

The program with a concentration in Language, Literacy and Culture (Reading, without licensure) prepares educational leaders and scholars who understand reading, language and literacy education in complex and diverse ways; particularly as these relate to issues of social justice and equity. This program emphasizes the development of critical and expansive perspectives on language and multiculturalism with a focus on the relevance of these for PreK-12 public school students from diverse ethno-linguistic backgrounds. Participants are encouraged to engage in leadership and research activities in a variety of settings at local, state and federal levels.

- To add a Reading Endorsement to a New Mexico Teaching license, students need 24 credits in reading or related area. Please see specific requirements set forth by New Mexico Public Education Department (<https://webnew.ped.state.nm.us/>)
- Courses with RDG prefix are not offered every semester. Please check with your faculty advisor to plan accordingly
- For additional information about the LLC program visit the program website (<https://tpal.nmsu.edu/degree-programs/concentrations/llc.html>)

Prefix	Title	Credits
Course Requirements		
<i>TPAL Core Courses</i>		
EDUC 5120	Multicultural Education	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
EDUC 5170	Action Research Projects ²	3
<i>Language, Literacy & Culture Courses</i> ¹		
READ 5350	Adult and Family Literacy	3
READ 5340	Literacy Assessment and Evaluation	3
READ 5360	Digital Literacies	3
READ 5210	Language and Literacy Acquisition	3
READ 5410	Theory and Pedagogy of Literature for Children and Adolescents	3
READ 5220	Sociopsycholinguistics of Reading	3
READ 5420	Theory and Pedagogy of Writing	3
Total Credits		33

¹ Students seeking a Reading Endorsement can use an upper level reading course from their undergraduate degree as part of the required 24 reading credits. Please check with your faculty advisor to plan accordingly.

² This course is the final core course that students are required to take. EDUC 5120 Multicultural Education, EDUC 5160 Curriculum and Pedagogy, and EDUC 5140 Research in Curriculum and Pedagogy are prerequisites to taking EDUC 5170 Action Research Projects.

Education (Secondary Licensure Prep) - Master of Arts

Secondary Licensure Prep

The School of Teacher Preparation, Administration and Leadership (TPAL) at New Mexico State University offers a Secondary Teacher Education Program for individuals who have completed a bachelor's degree. This program meets the professional education course requirements for initial teacher licensure as part of the Master of Arts in Education degree program. All coursework must be completed before the final student teaching semester.

Secondary teaching fields can be selected from English Language Arts, Social Studies, Mathematics, and General Science.

Program Completion Requirements:

1. Apply through NMSU Graduate School's main webpage (<https://gradschool.nmsu.edu/>). Select Intended major "Education (Secondary Licensure Prep)" as this is the concentration you will pursue
2. After you receive an acceptance letter from the Department of Curriculum & Instruction, contact your faculty advisor within the first semester of enrollment
3. Complete the Core Course Requirements listed below before admission to the Teacher Education Program

Admission to the Teacher Education Program (TEP):

1. Obtain application information at <https://tpal.nmsu.edu/admissions/tep-admission/> (<https://tpal.nmsu.edu/admissions/tep-admission.html>)
2. Make an appointment with the program director for a program of study before submitting the TEP portfolio.
3. Submit the TEP portfolio to the College of HEST Advising Center no later than 12:00 pm (MST) on the 3rd Friday in February for Spring and the 3rd Friday in September for Fall. TEP portfolio must be successfully reviewed before enrolling in Teaching Methods Courses.

Teaching Field & Other Course Completion Requirements:

1. Complete all the requirements for a teaching field in Secondary Education (English Language Arts, Mathematics, Science, Social Studies) before student teaching.
2. Transcripts will be evaluated for any teaching field deficiencies at the request of your Program Director.
3. Complete all remaining coursework (see below) before the Student Teaching courses.

Student Teaching Entry Portfolio (STEP)- one semester before student teaching

1. Obtain application information at <https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html>
2. Make an appointment with the Program Director for an updated program of study prior to submitting the STEP application.

- Before student teaching is approved, the Candidate must pass the Content Knowledge portion of the Praxis Assessment <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>).
- Submit Student Teaching Packet (STEP) on the 1st Friday in March for Fall and the 1st Friday in October for Spring.

Student Teaching- must be completed during the final semester

- Take EDUC 5811 and EDUC 5810 concurrently during student teaching (16-week Student Teaching Internship and Seminar).
- Before completing student teaching, candidates must pass the Praxis Principles of Learning and Teaching: Grade 7-12.

Prefix	Title	Credits
Course List		
<i>TPAL Core Courses</i>		
SPED 5105	Introduction to Special Education in a Diverse Society (TEP Prerequisite) ¹	3
EDUC 5120	Multicultural Education (TEP Prerequisite) ¹	3
EDUC 5110	Exploration in Education (TEP Prerequisite) ^{1, 2}	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
<i>Education Electives (6 credits) ³</i>		6
EDLT 5120	Critical Digital Literacy	
EDLT 5110	Foundations of Learning Design & Technology	
EDLT 5220	Culturally Responsive Teaching with Technology	
EDLT 5240	Online Teaching and Learning	
<i>Teaching Methods Courses</i>		
READ 5330	Content Area Literacy ⁴	3
Choose one Teaching Methods Course based on the Content Area (3 credits)		3
EDUC 5410	Teaching Science at the Middle and High School Level ^{2, 4}	
EDUC 5420	Teaching Mathematics at the Middle and High School Level ^{2, 4}	
EDUC 5430	Teaching Social Studies at the Middle and High School Level ^{2, 4}	
EDUC 5440	Teaching Language Arts at the Middle and High School Level ^{2, 4}	
<i>Student Teaching Block</i>		
EDUC 5810	Student Teaching ⁴	6
EDUC 5811	Teaching Methods Laboratory ⁴	3
Total Credits		39

¹ Courses are prerequisites/co-requisites for TEP

² Field Experience is required. You must complete a background check and fingerprinting process at the beginning of the semester to obtain district clearance. Fliers will be posted each semester in O'Donnell Hall.

³ Other electives can be selected with the program director's approval.

⁴ Courses require admission to TEP

Fall start

First Year		
Semester 1		
EDUC 5120	Multicultural Education ¹	3
SPED 5105	Introduction to Special Education in a Diverse Society ¹	3
EDUC 5130	Technology and Pedagogy ²	3

		Credits	9
Semester 2			
EDUC 5110	Exploration in Education ^{1, 3}		3
EDUC 5160	Curriculum and Pedagogy ²		3
EDUC 5140	Research in Curriculum and Pedagogy ²		3
Apply for TEP ⁴			
Must take Praxis Content Exam ⁵			
		Credits	9
Second Year			
Semester 1			
Choose one from the following (based on teaching content with field experience):			3
EDUC 5410	Teaching Science at the Middle and High School Level ^{3, 6}		
EDUC 5420	Teaching Mathematics at the Middle and High School Level ^{3, 6}		
EDUC 5430	Teaching Social Studies at the Middle and High School Level ^{3, 6}		
EDUC 5440	Teaching Language Arts at the Middle and High School Level ^{3, 6}		
READ 4330	Content Area Literacy ⁶		3
Elective Course ²			3
Apply for STEP ⁷			
		Credits	9
Semester 2			
EDUC 5811	Teaching Methods Laboratory		3
EDUC 5810	Student Teaching		6
Elective Course ¹			3
Must take Praxis Principles of Learning and Teaching: Grades 7-12.			
		Credits	12
		Total Credits	39

¹ The following course requirements can be taken in the semester they are listed, but it is recommended to take at least two of these in a summer session: EDUC 5160 Curriculum and Pedagogy, EDUC 5130 Technology and Pedagogy, EDUC 5140 Research in Curriculum and Pedagogy and Elective Courses

² To apply for TEP see the TPAL website (<https://tpal.nmsu.edu/academics/graduate-programs/ma-in-education/maed-plus-licensure/>)

³ Praxis Core Academic Skills

⁴ To apply for STEP see the TPAL website (<https://tpal.nmsu.edu/academics/graduate-programs/ma-in-education/maed-plus-licensure/>)

Spring start

First Year		
Semester 1		Credits
EDUC 5110	Exploration in Education ^{1, 2}	3
EDUC 5120	Multicultural Education ¹	3
SPED 5105	Introduction to Special Education in a Diverse Society ¹	3
Apply for TEP ³		
Credits		9
Semester 2		
Choose one from the following (based on teaching content with field experience):		3
EDUC 5410	Teaching Science at the Middle and High School Level ^{2, 4}	

EDUC 5420	Teaching Mathematics at the Middle and High School Level ^{2,4}	
EDUC 5430	Teaching Social Studies at the Middle and High School Level ^{2,4}	
EDUC 5440	Teaching Language Arts at the Middle and High School Level ^{2,4}	
READ 5330	Content Area Literacy ⁴	3
EDUC 5130	Technology and Pedagogy ⁵	3
Must take Praxis Content Exam. ⁶		
Credits		9
Second Year		
Semester 1		
EDUC 5160	Curriculum and Pedagogy ⁵	3
EDUC 5140	Research in Curriculum and Pedagogy ⁵	3
Elective Course ⁵		3
Apply for STEP ⁷		
Credits		9
Semester 2		
EDUC 5811	Teaching Methods Laboratory ⁴	3
EDUC 5810	Student Teaching ⁴	6
Elective Course ⁵		3
Must take Praxis Principles of Learning and Teaching: Grades 7-12.		
Credits		12
Total Credits		39

¹ Courses are prerequisites/co-requisites for TEP

² The following course requirements can be taken in the semester they are listed, but it is recommended to take at least two of these in a summer session: EDUC 5160 Curriculum and Pedagogy, EDUC 5130 Technology and Pedagogy, EDUC 5140 Research in Curriculum and Pedagogy and Elective Courses

³ Courses require field experience

⁴ To apply for TEP see the TPAL website (<https://tpal.nmsu.edu/academics/graduate-programs/ma-in-education/maed-plus-licensure/>)

⁵ Praxis Content Knowledge (<https://www.ets.org/praxis/nm/requirements/>)

⁶ Requires admission to TEP

⁷ To apply for STEP, see the TPAL Website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html>)

Education (Teaching English to Speakers of Other Languages) - Master of Arts

The program with a concentration in Teaching English to Speakers of Other Languages (TESOL, without licensure) prepares scholars, practitioners and leaders in understanding bilingualism/multilingualism within the context of schools, families, communities and society.

The Southwest Borderlands situate participants uniquely such that they might critically examine issues confronting Spanish-speaking and heritage language populations. A key dimension of the program is the advancement of issues related to equity and social justice by encouraging participants to serve as advocates for bilingual children, their families and communities. International contexts are considered part of the borderland and the TESOL International focus supports the preparation of teaching TESL across global settings.

- Students choose either the PreK-12 elective coursework for 33 credit hours **OR** the International elective coursework for 36 credits
- The necessary coursework required for the TESOL endorsement is embedded within this program of study. Should you require additional information regarding the endorsement, you should contact the New Mexico Public Education Department (<https://webnew.ped.state.nm.us/bureaus/licensure/adding-endorsements> (<https://webnew.ped.state.nm.us/bureaus/licensure/endorsements-how-to-add-a-license/>))
- Many specialized courses are not offered every semester. Please check with your faculty advisor to plan accordingly.

Prefix	Title	Credits
Course Requirements		
<i>TPAL Core Courses</i>		
EDUC 5120	Multicultural Education	3
EDUC 5140	Research in Curriculum and Pedagogy	3
<i>TESOL Core Courses</i>		
BLED 5210	Literacy-Language Instruction for Bilingual Students	3
EDLT 5130	Technology and Language Learning ¹	3
BLED 5110	Adult and Family Literacy in TESOL	3
BLED 5320	Second Language Acquisition	3
BLED 5410	Sociolinguistics in Education	3
BLED 5990	TESOL Practicum ²	3
BLED 5996	Selected Topics in Bilingual Education	3
LING 500	Introduction to Linguistics	3
TESOL Elective Coursework		3-6
<i>TESOL Elective Course PreK-12 (3 credits)</i>		
BLED 5310	Bilingual/Multicultural Schooling and Community Relations	
<i>OR TESOL Elective Course International (6 credits)</i>		
BLED 6992	Directed Study in Bilingual Education	
Total Credits		33-36

¹ It is encouraged that EDLT 5130 Technology and Language Learning and BLED 5420 Pedagogy of TESOL be taken concurrently.

² This is the final course and should be taken during the final semester.

Education (Spanish) - Master of Arts in Teaching

This program requires a minimum of 3 credit hours, with 15 credits in the School of Teacher Preparation, Administration and Leadership core courses and 18 credits from an area of teaching content concentration (i.e., generally in the College of Arts & Sciences) numbered 450 or above. This is a non-licensure degree that is intended for working teachers who already have a license but want to continue their studies, specialize in a specific teaching field and earn a master's degree. The professional coursework must be taken in the School of Teacher Preparation, Administration and Leadership and culminates with a written examination over the program of study. A candidate may choose to write a thesis in place of the written exam.

Prefix	Title	Credits
Course Requirements		
<i>TPAL Core Courses</i>		
EDUC 5120	Multicultural Education	3

EDUC 5160	Curriculum and Pedagogy	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
EDUC 5170	Action Research Projects	3
<i>Spanish Courses</i>		18
Two courses in Spanish Linguistics		
Two courses in Spanish Language Literature		
Fourteen credits of Spanish Elective Courses		
Total Credits		33

¹ This course is the final core course that students are required to take. EDUC 5120 Multicultural Education, EDUC 5160 Curriculum and Pedagogy, EDUC 5130 Technology and Pedagogy and EDUC 5140 Research in Curriculum and Pedagogy are prerequisites to taking EDUC 5170 Action Research Projects.

Educational Leadership & Administration (Higher Education Administration) - Master of Arts

Prerequisite

Students interested in higher education administration must have a bachelor's degree.

Application Deadline

This program begins in the spring semester only. All materials for this program must be received by the deadline specified on the School of TPAL website. Admission requirements are available from the School of TPAL, or on the website at <http://ela.nmsu.edu/index/academics/mainhied/> (<https://ela.nmsu.edu/academic-programs/ma-higher-ed/admission-require.html>). Students will be informed upon their formal acceptance into the program.

Program Delivery

There is a mandatory face-to-face orientation in Las Cruces prior to the start of the spring semester, January. All other classes are 100% online, distance delivery.

Prefix	Title	Credits
Course Requirements		
ELAD 5220	Management of Educational Change: Higher Education	3
ELAD 5215 or ELAD 5210	Higher Education Administration Community College Administration	3
ELAD 5230	Higher Education Finance and Funding	3
ELAD 5240	Management of Student Services in Higher Education	3
ELAD 5250	Higher Education Law	3
ELAD 5260	Administration of Adult and Continuing Education	3
ELAD 5270	Basing Decision on Data: Higher Education.	3
ELAD 5280	Internship: Higher Education Part I	3
ELAD 5285	Internship: Higher Education Part II	3
ELAD 5310	Leadership for Social Justice and Equity	3
ELAD 5510	Elements of Research	3
Total Credits		33

A Suggested Plan of Study

The Master of Arts in Educational Administration with a Concentration in Higher Education Administration begin enrollment in the Spring semester and has Summer coursework. Students will complete the program in a Spring-Summer-Fall format.

First Year

Semester 1		Credits
ELAD 5210 or ELAD 5215	Community College Administration or Higher Education Administration	3
ELAD 5510	Elements of Research	3
Credits		6

Semester 2

ELAD 5220	Management of Educational Change: Higher Education	3
ELAD 5230	Higher Education Finance and Funding	3
Credits		6

Semester 3

ELAD 5240	Management of Student Services in Higher Education	3
ELAD 5250	Higher Education Law	3
Credits		6

Second Year

Semester 1

ELAD 5310	Leadership for Social Justice and Equity	3
ELAD 5280	Internship: Higher Education Part I	3
Credits		6

Semester 2

ELAD 5260	Administration of Adult and Continuing Education	3
ELAD 5270	Basing Decision on Data: Higher Education.	3
Credits		6

Semester 3

ELAD 5285	Internship: Higher Education Part II	3
Credits		3
Total Credits		33

Educational Leadership & Administration (Pk-12 Administration) - Master of Arts

The program of study for Pk-12 school administration includes all coursework and internships required by the New Mexico Public Education Department for Administrative Licensure. Students must earn a minimum of a "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course. In addition, students must successfully complete a final department examination, generally done during the final semester of coursework. The department does not offer the thesis option.

Prerequisites

Students interested in the Pk-12 school administration must have a current U.S. teaching license and three years of full-time teaching experience in the Pk-12 sector.

Application Deadline

This program begins in the spring semester only. All materials for this program must be received by the deadline specified on the ELA website. Admission requirements are available from the School of TPAL or on the website at <https://ela.nmsu.edu/academic-programs/pk-12-ma/pk-12-admissions.html>. Students will be informed upon their formal acceptance into the program.

Program Delivery

The department uses a hybrid distance education program combining both asynchronous and synchronous delivery technologies. The internships require attendance at monthly seminars that are held face-to-face on the Las Cruces campus. There is a mandatory face-to-face orientation in Las Cruces prior to the start of the spring semester, January. All other coursework is online.

Prefix	Title	Credits
Course Requirements		
ELAD 5110	The Principalship	3
ELAD 5120	Leadership and Administration of Bilingual Education	3
ELAD 5130	Basing Decision on Data: Pk-12	3
ELAD 5140	Educational Financial Management	3
ELAD 5150	Public School Law	3
ELAD 5160	Management of Educational Change: Public Schools	3
ELAD 5170	Special Education Administration	3
ELAD 5180	Internship Public Schools Part I	3
ELAD 5185	Internship: Public Schools Part II	3
ELAD 5310	Leadership for Social Justice and Equity	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
Total Credits		33

A Suggested Plan of Study

The Master of Arts in Educational Administration with a Concentration in Pk-12 Administration begin enrollment in the Spring semester and has Summer coursework. Students will complete the program in a Spring-Summer-Fall format.

First Year		
Semester 1		Credits
ELAD 5110	The Principalship	3
ELAD 5310	Leadership for Social Justice and Equity	3
Credits		6
Semester 2		
ELAD 5120	Leadership and Administration of Bilingual Education	3
ELAD 5130	Basing Decision on Data: Pk-12	3
Credits		6
Semester 3		
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
ELAD 5140	Educational Financial Management	3
Credits		6
Second Year		
Semester 1		
ELAD 5150	Public School Law	3

ELAD 5180	Internship Public Schools Part I	3
Credits		6
Semester 2		
ELAD 5160	Management of Educational Change: Public Schools	3
ELAD 5170	Special Education Administration	3
Credits		6
Semester 3		
ELAD 5185	Internship: Public Schools Part II	3
Credits		3
Total Credits		33

Electrical Engineering - Master of Engineering in Electrical Engineering Requirements and Options for the MEEE Degree

The Program Educational Objectives for the Master of Engineering Program in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The MEEE is a coursework-only option for obtaining a master's degree. The requirement is a total of 30 credits of graduate course work, including passing with a grade of B or better six Graduate Expanded Core Courses from at least three different areas of emphasis. No oral exam is required for the MEEE.

Prefix	Title	Credits
Graduate Expanded Core Courses: choose 6 from at least 3 different areas¹		18-21
<i>Electromagnetics</i>		
E E 515	Electromagnetic Theory I ²	
E E 516	Electromagnetic Theory II	
E E 521	Microwave Engineering	
E E 541	Antennas and Radiation	
E E 548	Introduction to Radar	
E E 549	Smart Antennas	
E E 615	Computational Electromagnetics	
<i>Microelectronics/VLSI</i>		
E E 510	Introduction to Analog and Digital VLSI	
E E 512	ASIC Design	
E E 523	Analog VLSI Design ²	
E E 567	ARM SOC Design	
<i>Photonics</i>		
E E 528	Fundamentals of Photonics ²	
E E 529	Lasers and Applications ²	
E E 577	Fourier Methods in Electro-Optics	
E E 578	Optical System Design	
<i>Electric Energy Systems</i>		
E E 534	Power System Relaying	
E E 537	Power Electronics	
E E 540	Photovoltaic Devices and Systems	

E E 542	Power Systems II
E E 543	Power Systems III ²
E E 544	Distribution Systems
<i>Digital Signal Processing</i>	
E E 545	Digital Signal Processing II ²
E E 565	Machine Learning I ³
E E 576	Geometric Algebra ³
E E 585	Telemetry Systems ³
E E 588	Advanced Image Processing
E E 596	Digital Image Processing ³
E E 597	Neural Signal Processing
<i>Computer Engineering</i>	
E E 558	Hardware Security and Trust
E E 562	Computer Systems Architecture ²
E E 563	Computer Performance Analysis I
E E 564	Architectural Concepts II
E E 590	Selected Topics (Introduction to Quantum Computing)
E E 590	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)
E E 593	Mobile Application Development
<i>Communications</i>	
E E 571	Random Signal Analysis ²
E E 572	Modern Coding Theory
E E 573	Signal Compression
E E 581	Digital Communication Systems I
E E 583	Wireless Communications
E E 585	Telemetry Systems ³
E E 586	Information Theory
<i>Controls & Robotics</i>	
E E 551	Control Systems Synthesis ²
E E 565	Machine Learning I ³
E E 576	Geometric Algebra ³
E E 596	Digital Image Processing ³
Graduate Electives: choose 3 to 4 courses ⁴	
Total Credits	
30	

¹ The graduate expanded core courses must be passed with a grade of B or better. Note—a grade of B- (or lower) in a graduate expanded core course will not satisfy completion of that course for the MEEE.

² This course is one of the MSEE Graduate Core Courses. Students pursuing the MEEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from this subset of courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see <https://ece.nmsu.edu/grad-study/phd-qualifying.html>) for more information.

³ This course is included in multiple areas of emphasis. Students may use this course to satisfy **one** area of emphasis.

⁴ E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

Included Prefixes

Graduate course work credits from the following prefixes are permitted for the MEEE degree. If a graduate course outside this list of prefixes

logically fits into the MEEE program, see your graduate advisor about requesting an exception.

Prefix	Title	Credits
<i>College of Agriculture/Consumer/Environmental Sciences</i>		
AEEC		
ENVS		
GENE		
<i>College of Arts and Sciences</i>		
ASTR		
BCHE		
BIOL		
C S		
CHEM		
GEOL		
GPHY		
LING		
MATH		
MOLB		
PHYS		
STAT		
<i>College of Business</i>		
ECON		
MGMT		
<i>College of Engineering</i>		
A E		
A EN		
CHME		
E E		
ENVE		
I E		
M E		
SUR		

Excluded Courses

Credits from the following courses do not count toward an MEEE degree:

Prefix	Title	Credits
C S 451	C++ Programming	3
C S 452	Java Programming	3
C S 453	Python Programming I	3
C S 458	R Programming I	3
C S 460	Computer Science I Transition	3
C S 462	Object Oriented Programming Transition	3
C S 463	Introduction to Data Structures Transition	3
C S 464	Machine Programming and Organization Transition	3
C S 465	Discrete Math for Computer Science Transition	3
C S 466	Compilers and Automata Transition	3
C S 468	Software Development Transition	3
C S 469	Data Structure and Algorithms Transition	3

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students

can take up to 12 credits of E E graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree.

You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other E E 500+ course that is taught concurrently with an E E 400+ course may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. E E 450+ courses are not eligible for dual course credit nor are E E 500+ courses that are not taught concurrently with an E E 400+ course

Prefix	Title	Credits
E E 510	Introduction to Analog and Digital VLSI	3
E E 528	Fundamentals of Photonics	4
E E 542	Power Systems II	3
E E 562	Computer Systems Architecture	3
E E 565	Machine Learning I	3
E E 596	Digital Image Processing	3

Electrical Engineering - Master of Science in Electrical Engineering Requirements and Options for the MSEE degree

The Program Educational Objectives for the Master of Science in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

Note—the following degree requirement tables outline the **minimum** requirements for an MSEE. As many students must register for a minimum of 9 credits each semester to remain full time, a student will often take more than the minimum of 6 credits of E E 599 Master's Thesis or 3 credits of E E 598 Master's Technical Report to complete their degree.

Thesis Option:

Prefix	Title	Credits
Graduate Core Courses (choose 2-3 from 2-3 different areas) ¹		6-10
<i>Electromagnetics</i>		
E E 515	Electromagnetic Theory I	
<i>Microelectronics/VLSI</i>		
E E 523	Analog VLSI Design	
<i>Photonics/Optics</i>		
E E 528	Fundamentals of Photonics	
or E E 529	Lasers and Applications	
<i>Electric Energy Systems</i>		
E E 543	Power Systems III	
<i>Digital Signal Processing</i>		
E E 545	Digital Signal Processing II	
<i>Computer Engineering</i>		
E E 562	Computer Systems Architecture	
<i>Communications</i>		
E E 571	Random Signal Analysis	
<i>Controls & Robotics</i>		
E E 551	Control Systems Synthesis	
Graduate Breadth Elective (choose 1-0 courses) from a third area ¹		4-0
<i>Electromagnetics</i>		
E E 541	Antennas and Radiation	
<i>Microelectronics/VLSI</i>		
E E 512	ASIC Design	
<i>Electric Energy Systems</i>		
E E 537	Power Electronics	
<i>Digital Signal Processing</i>		
E E 585	Telemetry Systems	
<i>Communications</i>		
E E 581	Digital Communication Systems I	
<i>Controls & Robotics</i>		
E E 576	Geometric Algebra	
Graduate Electives ²		13-15
Master's Thesis		
E E 599	Master's Thesis	
Complete and defend master's thesis ³		
Total Credits		30

¹ Students must take at least two core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth elective must be taken from a third area of emphasis.

Students pursuing the MSEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from the graduate core courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see <https://ece.nmsu.edu/grad-study/phd-qualifying.html>) for more information.

² E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. The total number of E E credits, including the graduate core and/or graduate breadth electives and excluding credits of E E 599 Master's Thesis must be at least 12. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

³ The thesis must be completed and orally defended.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

Technical Report Option:

Prefix	Title	Credits
Graduate Core Courses (choose 2-3 from 2-3 different areas) ¹		6-10
<i>Electromagnetics</i>		
E E 515	Electromagnetic Theory I	
<i>Microelectronics/VLSI</i>		
E E 523	Analog VLSI Design	
<i>Photonics/Optics</i>		
E E 528	Fundamentals of Photonics	
or E E 529	Lasers and Applications	
<i>Electric Energy Systems</i>		
E E 543	Power Systems III	
<i>Digital Signal Processing</i>		
E E 545	Digital Signal Processing II	
<i>Computer Engineering</i>		
E E 562	Computer Systems Architecture	
<i>Communications</i>		
E E 571	Random Signal Analysis	
<i>Controls & Robotics</i>		
E E 551	Control Systems Synthesis	
Graduate Breadth Elective (choose 1-0 courses from a third area ¹		4-0
<i>Electromagnetics</i>		
E E 541	Antennas and Radiation	
<i>Microelectronics/VLSI</i>		
E E 512	ASIC Design	
<i>Electric Energy Systems</i>		
E E 537	Power Electronics	
<i>Digital Signal Processing</i>		
E E 585	Telemetry Systems	
<i>Communications</i>		
E E 581	Digital Communication Systems I	
<i>Controls & Robotics</i>		
E E 576	Geometric Algebra	
Graduate Electives ²		16-18
Master's Technical Report		
E E 598	Master's Technical Report	
Complete and defend master's technical report ³		
Total Credits		30

¹ Students must take at least two core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth elective must be taken from a third area of emphasis. Students pursuing the MSEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from the graduate core courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see <https://ece.nmsu.edu/grad-study/phd-qualifying.html>) for more information.

² E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. The total number of E E credits, including the graduate core and/or graduate breadth electives and excluding credits of E E 598 Master's Technical Report must be at least 12. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

³ The technical report must be completed and orally defended.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

Included Prefixes

Graduate course work credits from the following prefixes are permitted for the MSEE degree. If a graduate course outside this list of prefixes logically fits into the MSEE program, see your graduate advisor about requesting an exception.

Prefix	Title	Credits
<i>College of Agriculture/Consumer/Environmental Sciences</i>		
AEEC		
ENVS		
GENE		
<i>College of Arts and Sciences</i>		
ASTR		
BCHE		
BIOL		
C S		
CHEM		
GEOL		
GPHY		
LING		
MATH		
MOLB		
PHYS		
STAT		
<i>College of Business</i>		
ECON		
MGMT		
<i>College of Engineering</i>		
A E		
A EN		
CHME		
E E		
ENVE		
I E		
M E		
SUR		

Excluded Courses

Credits from the following courses do not count toward an MSEE degree:

Prefix	Title	Credits
C S 451	C++ Programming	3
C S 452	Java Programming	3
C S 453	Python Programming I	3
C S 458	R Programming I	3
C S 460	Computer Science I Transition	3
C S 462	Object Oriented Programming Transition	3
C S 463	Introduction to Data Structures Transition	3
C S 464	Machine Programming and Organization Transition	3
C S 465	Discrete Math for Computer Science Transition	3
C S 466	Compilers and Automata Transition	3
C S 468	Software Development Transition	3
C S 469	Data Structure and Algorithms Transition	3

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires

four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of E E graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree.

You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other E E 500+ course that is taught concurrently with an E E 400+ course may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. E E 450+ courses are not eligible for dual course credit nor are E E 500+ courses that are not taught concurrently with an E E 400+ course.

Prefix	Title	Credits
E E 510	Introduction to Analog and Digital VLSI	3
E E 528	Fundamentals of Photonics	4
E E 542	Power Systems II	3
E E 562	Computer Systems Architecture	3
E E 565	Machine Learning I	3
E E 596	Digital Image Processing	3

English - Master of Arts

New Mexico State University offers MA programs in four areas of emphasis; each one requires 33 hours of graduate-level work.

Emphasis: Creative Writing

Students electing this emphasis:

- complete 33 hours of graduate-level course work including creative writing and literature;
- submit a creative writing portfolio (totaling 20-50 pages), depending on genre choices, that includes original creative work in more than one genre and either an essay describing the writer's personal poetics or a critical piece of writing relevant to the portfolio; and
- pass an oral examination.

Prefix	Title	Credits
Required Coursework ¹		
Workshop courses in at least two genres		12
Graduate form and technique courses		6

Graduate literature courses in the Department of English		9
Elective courses		6
In the final term, take one of the following:		
ENGL 574	Workshop: Advanced Writing Prose	
ENGL 575	Workshop: Advanced Writing Poetry	
ENGL 576	Workshop: Advanced Writing Playwriting	
Total Credits		33

¹ Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

Emphasis: English Studies for Teachers

Students take 33 hours of graduate coursework, including core courses in creative writing, film, literature and rhetoric and professional communication, as well as additional courses in an area of specialization approved by an advisor. Students in the program develop individualized plans of study in consultation with an advisor. They conclude their program by developing a master's portfolio or other approved capstone project and passing an oral examination. This portfolio may provide material for public schools' Professional Development Dossier. With advisor approval, students may take up to two related courses (six credit hours) in other departments, such as Communication Studies, Education, Journalism, and Theatre, and may also develop an alternative capstone experience and enroll for appropriate credits (such as independent study).

Prefix	Title	Credits
Required Coursework		
Core class in Composition, Rhetoric, and Professional Communication		3
Core class in Creative Writing		3
Core class in Literature		3
Core class in Film		3
Courses in core area of specialization		18-21
Courses typically meeting capstone requirement:		3-6
ENGL 577	Workshop: Advanced Technical and Professional Writing	
Or Portfolio		
Total Credits		33-39

Emphasis: Literature

Students electing this emphasis can choose to work in various areas of literature, criticism and film. Students are required to

- complete 33 hours of coursework while satisfying area requirements (in early and modern literatures, in British and American Literatures, and in critical theory) with advisor-approved courses;
- demonstrate competency in a foreign language;
- deliver a public presentation on their research;
- write a master essay or thesis; and
- complete their program by passing an oral examination.

See advisor for list of courses satisfying theory and distribution requirements.

Prefix	Title	Credits
Required Coursework ¹		
Graduate course in critical theory		3
Literature courses, including "early" and "late" periods, English and American		18

Elective courses in English Department		9-12
Master's Thesis or Master Essay		
ENGL 599	Master's Thesis ²	3-6
or ENGL 598	Master's Essay	
Total Credits		33-39

¹ Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

² Students must take 6 credits of ENGL 599 Master's Thesis to complete this requirement.

Emphasis: Rhetoric and Professional Communication

Students electing this emphasis take core courses across a wide range of topics within rhetoric and professional communication and choose from one of four areas of specialization:

- Composition,
- Critical/Cultural Studies,
- Rhetoric and
- Professional and Technical Communication.

Students conclude their program by writing a thesis, composing a portfolio of work completed in the program, or writing a master essay and by passing an oral examination. Students develop individualized plans of study in consultation with an advisor.

Prefix	Title	Credits
Required Coursework		
Methods Course		
Select one from the following:		3
ENGL 548	Graduate Study in Empirical Research	
ENGL 601	Qualitative Research	
ENGL 602	Quantitative Research	
ENGL 604	Digital Research Methods	
Elective Courses		
Select one from the following:		3-6
Advisor-approved electives in English and/or related fields		
ENGL 597	Internship in Technical and Professional Communication	
Capstone Course		
Select one from the following: ²		3-6
ENGL 585	Advanced Writing Workshop: RPC Capstone	
ENGL 598	Master's Essay	
ENGL 599	Master's Thesis ¹	
Core Courses		
Select two core courses from area of specialization.		6
Select two core courses from any of the other three core areas:		6
Core Composition Courses		
ENGL 564	History and Theory of Composition Studies	
ENGL 570	Graduate Study in Approaches to Composition ³	
ENGL 571	Composition Pedagogy and Practicum ³	
ENGL 583	Critical Writing Studies	
Core Critical/Cultural Studies Courses		
ENGL 517	Graduate Study in Critical Theory	
ENGL 568	Rhetoric and Cultural Studies	

ENGL 583	Critical Writing Studies	
Core Professional and Technical Communication Courses		
ENGL 502	Critical Conversations in Technical and Professional Communication	
ENGL 512	Graduate Study in Writing in the Workplace	
ENGL 543	Multimedia Theory and Production	
ENGL 572	Technical-Professional Communication Pedagogies	
Core Rhetoric Courses		
ENGL 518	History of Rhetoric	
ENGL 519	Graduate Study in Modern Rhetorical Theory	
ENGL 568	Rhetoric and Cultural Studies	
Specialized Courses		
Select four additional courses in area of specialization determined in consultation with an advisor. ⁴		12
Composition Courses		
ENGL 549	Graduate Study in Writing	
ENGL 550	Graduate Study in Literacy	
ENGL 561	Topics in Writing Program Administration	
Critical/Cultural Studies Courses		
ENGL 549	Graduate Study in Writing	
ENGL 550	Graduate Study in Literacy	
ENGL 555	Graduate Study in Rhetoric of Scientific Literature	
ENGL 590	Master's Seminar in Rhetoric	
Professional and Technical Communication Courses		
ENGL 478	Document Design	
ENGL 503	Web Design and Development	
ENGL 504	User Experience and Assistance	
ENGL 531	Technical Editing	
ENGL 543	Multimedia Theory and Production	
ENGL 549	Graduate Study in Writing	
ENGL 560	Proposal and Grant Writing	
ENGL 565	Intercultural Rhetoric and Professional Communication	
ENGL 577	Workshop: Advanced Technical and Professional Writing	
ENGL 578	Topics in Rhetoric and Technology	
Rhetoric Courses		
ENGL 549	Graduate Study in Writing	
ENGL 555	Graduate Study in Rhetoric of Scientific Literature	
ENGL 590	Master's Seminar in Rhetoric	
Total Credits		33-39

¹ Students must take 6 credits of ENGL 599 Master's Thesis to complete this requirement. ENGL 599 Master's Thesis: in lieu of portfolio or master essay.

² Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

³ Students may take either ENGL 570 Graduate Study in Approaches to Composition or ENGL 571 Composition Pedagogy and Practicum as a core course. Taking a second course will count under the area of specialization.

⁴ Students are encouraged to take ENGL 510 Proseminar in Rhetoric and Professional Communication, early in their time as a graduate student. This course is appropriate for all areas of specialization. Appropriate courses for each specialization are suggested, though the lists are not

inclusive of all options (for example, students may take additional core courses as part of their specialization).

Master's Accelerated Program in English with an Emphasis in Literature

The Master's Accelerated Program is an opportunity for qualified, advanced undergraduate students to begin graduate study while still enrolled as an undergraduate student. Students accepted into the program will be able to take up to 12 credits that can be applied to a Master's degree in English at New Mexico State University (just over one third of the required credits to obtain a graduate degree in English at NMSU).

Student Qualifications

Potential MAP students must meet the minimum qualifications for the program as outlined in the Graduate School policy concerning MAP programs.

In addition to these qualifications, students must meet the following requirements in order to be eligible for application to the MAP program.

- Must have a GPA of 3.0 or higher
- Must apply to the program with sufficient time to take the 12 credit hours that will be applied toward the overall program of study. Students will not be able to retroactively apply credits to MAP program.
- Must participate in the Developing New Scholars Program (DSNP), offered by the Graduate School and Honor's College.
- Consult with the Director of Undergraduate Studies on courses eligible and complete the Graduate School MAP form.
- Meet with their financial aid advisor, if they receive financial aid, as financial aid awards may have to be adjusted based on course registration.
- Completed 60 credits, including at least one (1) 400-level literature class and one (1) of the following courses ENGL 301 Theory and Criticism: Rhetoric and Culture, ENGL 302 Theory and Criticism: Literature and Culture, ENGL 303 Theory and Criticism: Film, Media and Culture, or ENGL 310 Critical Writing.

Applying for the MAP

To apply for the MAP fill out the the English Application to the Master's Accelerated Program and a scholarly writing sample (a course paper that showcases your skills in literary analysis). Send these materials to the Director of Undergraduate Studies, Dr. Tyson Stolte, at tmstolte@nmsu.edu. Applicants will also need to fill out the Graduate School's MAP form.

Approved MAP Courses:

The courses below can count toward the 12 credits toward an MA degree available to MAP students.

Prefix	Title	Credits
ENGL 453	World Literatures	3
ENGL 469	Advanced Study in American Literature	3
ENGL 505	Graduate Study in Chaucer	3
ENGL 508	Graduate Study in Shakespeare I	3
ENGL 509	Graduate Study in Shakespeare II	3
ENGL 533	Victorian Literature	3

Environmental Engineering - Master of Science in Environmental Engineering

Environmental engineering at New Mexico State University provides unique educational and research opportunities at the graduate level in the fields of water quality, aquatic chemistry, environmental microbiology, water treatment, water pollution control, wastewater treatment reclamation and reuse, desalination, membrane processes, industrial, hazardous, and solid waste management, groundwater remediation, contaminant fate and transport, resource recovery from waste streams, air pollution control, and nanotechnologies in environmental applications. Therefore, course offerings emphasize basic engineering and scientific principles, as well as the design and application of environmental engineering unit operations and processes. Special topics and thesis research are closely matched with faculty expertise and the professional goals of graduate students. The programs of study are specifically designed for individual students, taking advantage of not only the program capabilities, but also of the complementary activities of the university as a whole as well as the student's professional experience and work environment.

Graduate students satisfy degree requirements in environmental engineering by completing specific core course work. Course work in the graduate program includes the following:

- water and wastewater treatment
- solid and hazardous waste systems design
- environmental chemistry
- environmental microbiology
- environmental contaminant analysis
- industrial pollution control
- fate and transport of pollutants in engineered and natural systems
- water quality in surface water and groundwater systems
- advanced water treatment

Additional topics of interest to the students are offered through special topics classes and by courses taught outside of the College of Engineering.

The Master of Science (M.S.) program in Environmental Engineering requires either a thesis or non-thesis practice-oriented experience. The thesis track consists of a minimum of 30 semester credit hours, including 6 credit hours of thesis. The non-thesis track is designed primarily for students who are working full-time in engineering practice, but is also available to students working part-time. This track consists of 30 semester credit hours, including 6 credit hours of an engineering practicum (ENVE 598 Special Research Programs) of which up to 3 credit hours can be earned for a professional engineering design experience. Transfer credit for courses taken elsewhere is evaluated on an individual basis. Up to 6 semester hours of graduate level courses may be used to satisfy M.S. degree requirements provided that the credits were not used towards another degree.

Required Curriculum

The graduate environmental engineering program of the Civil Engineering Department expects all M.S. students to meet certain requirements in pursuit of an advanced degree. Some of these requirements are related to the quantity, level, and quality of coursework. This Graduate Catalog

details what is expected as a minimum for graduation, but it is up to the student and his/her advisor and graduate committee to determine the program of study for the student. The student and his/her advisor will create this program of study in the first semester of graduate work.

Students desiring to work toward an advanced degree in environmental engineering must have completed undergraduate preparation similar to that required for a Bachelor of Science degree in an ABET accredited engineering program or must have adequate background, as determined by the graduate faculty of the program. The background courses listed below may be required if the student did not take a similar course at the undergraduate level, as determined by the graduate faculty of the program.

Environmental engineering faculty will form a committee for every entering student. The faculty will evaluate the student's record and determine which deficiencies or core courses, if any, are needed by the student. The required curriculum consists of 12 credit hours of core courses, 6 credit hours of Master's Thesis (thesis track) or Special Research Programs (non-thesis track), and 12 credit hours of elective courses. For all professional non-thesis programs, the department head will review the committee's decision.

Prefix	Title	Credits
Background Courses		
C E 356	Fundamentals of Environmental Engineering	
C E 382	Hydraulic and Hydrologic Engineering	
ENVE 456	Environmental Engineering Design	
Core Courses		12
ENVE 550	Aquatic Chemistry	
ENVE 551	Unit Processes/Operation of Water Treatment	
ENVE 552	Unit Processes/Operation of Wastewater Treatment	
ENVE 557	Surface Water Quality Modeling	
Thesis or Professional Experience ¹		6
ENVE 598	Special Research Programs	
or ENVE 599	Master's Thesis	
Elective Courses ²		12
Total Credits		30

¹ ENVE 598 Special Research Programs: practicum for students pursuing the non-thesis track. ENVE 599 Master's Thesis: required for students pursuing the thesis track.

² Elective courses may be taken from any department and must be approved by the student's advisor and graduate committee.

Professional Development Electives for the Non-Thesis Track (outside the College of Engineering)

For students pursuing the non-thesis track, a minimum of 6 credit hours in graduate-level communications, management, economics, or other relevant disciplines are required as part of the 12 elective credit hour requirement. These courses will be selected by the student and must be approved by the student's advisor and graduate committee.

Experimental Psychology - Master of Arts

The department offers an MA degree in general experimental psychology. The program provides students with sufficient electives to emphasize a particular sub-area of experimental psychology. The program is designed to provide graduates with the tools and knowledge necessary for further training at the doctoral level or for employment in industry or government.

MA students are required to complete:

Prefix	Title	Credits
First Year Research Project		
PSYC 598	Special Research Programs	4-6
Core Course (corresponding to the student's area of study):		3
PSYC 524	Cognitive Psychology	
PSYC 527	Social Psychology	
PSYC 547	Engineering Psychology	
Two other Content Courses:		6
PSYC 520	Learning	
PSYC 522	Sensation and Perception	
PSYC 540	History and Systems of Psychology	
The Quantitative/Computer Methods Sequence:		9
PSYC 507	Quantitative Methods in Psychology I	3
PSYC 508	Quantitative Methods in Psychology II	3
PSYC 510	Computer Methodology	3
Research Thesis:		
PSYC 599	Master's Thesis	6

¹ Students are also encouraged to register for one credit of PSYC 590 Research Seminar in Psychology each semester.

When offered, PSYC 570 Special Topics may be considered content, quantitative methods, or experimental methods, depending on the specific course content.

Family and Consumer Sciences (Food Science and Technology) - Master of Science

The Department of Family and Consumer Sciences offers a Master of Science degree with a concentration in Food Science and Technology. The degree is earned after satisfactory completion of 30 credit hours of upper division and graduate-level courses. The curriculum is completed in four academic semesters and includes a creative component. Once admitted to the program, each student will work with an advisor to develop an academic plan of study. The major advisor and the student will also select an advisory committee consisting of an additional departmental faculty member and a third member from outside the department.

Prefix	Title	Credits
Require Core Courses		
Statistics ¹		3
Research Methods ²		3
FCSC 599	Master's Thesis (Creative Component) ³	6
Choose 18 credits from the following (in consultation with advisor):		18

FSTE 480	Food Safety
FSTE 492	Special Problems
FSTE 520	Graduate Study in Food Microbiology
FSTE 521	Graduate Study in Food Chemistry
FSTE 523	Food Processing Technologies
FSTE 524	Sensory Evaluation of Foods
FSTE 525	Graduate Study in Food Analysis
FSTE 531	Food Preservation
FSTE 532	Designing and Brewing Great Beers of the World
FSTE 598	Special Research Programs
FCSC 590	Special Topics
Total Credits	30

¹ Any statistics course that is approved by major advisor

² Any research methods course that is approved by major advisor

³ The creative component of the program involves completing at least 6 credits of FCSC 599 Master's Thesis. This requires the student, in consultation with the advisory committee, to conduct a research project and prepare a written manuscript. The student will present results of the project in the graduate seminar and then be examined by the advisory committee.

Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science

Prefix	Title	Credits
Required Courses		
<i>Human Development Course</i>		
FCST 548	Adult Development and Aging	9
FCST 510	Infancy and Early Childhood in the Family	
FCST 583	Parenting and Child Guidance	
or a Human Development Course that has been approved by an advisor		
<i>Professional Studies</i>		
FCST 584	Family Law and Ethics	3
<i>Marital and Family Therapy</i>		
FCST 572	Family Dysfunction and Diagnosis	3
FCST 582	Theories of Marriage and Family Therapy	3
FCST 592	Strategies in Family Therapy	3
FCST 562	The Business and Practice of Marriage and Family Therapy	1
<i>Marital and Family Studies</i>		
FCST 586	Sexuality and Family Dynamics	3
FCST 589	Family Crises and Rehabilitation	3
FCST 585	The Family System	3
FCST 587	Contemporary Marriage and Family Issues	3
<i>Multicultural</i>		
FCST 549	Family Ethnicities and Subcultures	3
<i>Research and Statistics</i>		
Any graduate statistics course that is approved by the Director of the Marriage and Family Therapy Program		3
Any graduate research methods course that is approved by the Director of the Marriage and Family Therapy Program		3
<i>Practicum</i>		

FCST 525	Supervised Clinical Practice	9
Total Credits		52
First Year		
Fall		Credits
FCST 572	Family Dysfunction and Diagnosis	3
FCST 582	Theories of Marriage and Family Therapy	3
FCST 585	The Family System	3
Credits		9
Spring		
FCST 592	Strategies in Family Therapy	3
Human Development Course		3
FCST 587	Contemporary Marriage and Family Issues	3
Credits		9
Summer		
FCST 584	Family Law and Ethics	3
Credits		3
Second Year		
Fall		
FCST 525	Supervised Clinical Practice	3
Human Development Course ¹		3
FCST 583	Parenting and Child Guidance	
FCST 589	Family Crises and Rehabilitation	3
Statistics Course ¹		3
Credits		12
Spring		
FCST 525	Supervised Clinical Practice	3
FCST 562	The Business and Practice of Marriage and Family Therapy	1
FCST 586	Sexuality and Family Dynamics	3
FCST 549	Family Ethnicities and Subcultures	3
EDUC 519	Research in Curriculum and Pedagogy	3
Credits		13
Summer		
FCST 525	Supervised Clinical Practice	3
Human Development Course ¹		3
Credits		6
Total Credits		52

¹ Must be approved with an advisor

Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science

The concentration in Hotel, Restaurant and Tourism Management combines both coursework and research to expand the student's knowledge, abilities, and problem-solving skills. Students begin the program by learning about the current trends in a wide range of hotel, restaurant and tourism academic research areas. Students also take graduate classes that apply to their chosen area of specialization. Some students focus on general hospitality management. However, most choose an area of interest such as tourism, foodservice, hotel operations, culinary arts, destination management, revenue management, sales and marketing, hospitality or culinary education, beverage management,

vacation ownership, hospitality information systems, or human resource management/training.

Thesis Option

Prefix	Title	Credits
Departmental/Program Requirements		
Graduate Level Statistics ¹		3
Graduate Level Research Methods ²		3
<i>HRTM Graduate Courses</i>		
HRTM 501	The Hospitality Industry and Sustainable Competitive Strategy	3
HRTM 502	Advanced Hospitality Services Management	3
HRTM 506	Contemporary Global Issues in Hospitality	3
<i>Specialized Graduate Electives</i>		
Students can select from HRTM, AXED, FCST, Education and Business courses based on their personal learning objectives ³		12-15
<i>Thesis</i>		
HRTM 599	Master's Thesis	3-6
Total Credits		30-36

¹ **Graduate Level Statistics Class:** AXED 5515 Data Collection and Analysis, STAT 525 Statistics: Theory and Applications or Other Approved Course

² **Graduate Level Research Methods Class:** HRTM 505 Hospitality Research Methods & Analysis, AXED 5510 Research Methods or Other Approved Course

³ HRTM 598 Special Research Programs is recommended as an additional research methods course

Non-Thesis Option

Prefix	Title	Credits
Departmental/Program Requirements		
Graduate Level Statistics ¹		3
Graduate Level Research Methods ²		3
<i>HRTM Graduate Courses</i>		
HRTM 501	The Hospitality Industry and Sustainable Competitive Strategy	3
HRTM 502	Advanced Hospitality Services Management	3
HRTM 506	Contemporary Global Issues in Hospitality	3
<i>Specialized Graduate Electives</i>		
Students can select from HRTM, AXED, FCST, Education and Business courses based on their personal learning objectives		12
<i>Non-Thesis</i>		
HRTM 515	Applied Management Project	3
Total Credits		30

¹ **Graduate Level Statistics Class:** AXED 5515 Data Collection and Analysis, STAT 525 Statistics: Theory and Applications or Other Approved Course

² **Graduate Level Research Methods Class:** HRTM 505 Hospitality Research Methods & Analysis, AXED 5510 Research Methods or Other Approved Course

Suggested Plan of Study

This assumes students will be full-time students taking 9 credits per semester and is based on a Fall Start and availability of classes.

Thesis Option

Semester 1		Credits
HRTM 501	The Hospitality Industry and Sustainable Competitive Strategy	3
Graduate Level Research Methods Course		3
HRTM Graduate Elective		3
Credits		9
Semester 2		
HRTM 502 or HRTM 506	Advanced Hospitality Services Management or Contemporary Global Issues in Hospitality	3
Graduate Level Statistics Course		3
If the student is electing to complete the 15 credits of electives, choose one from the following:		0-3
HRTM 598	Special Research Programs	
HRTM Graduate Elective (3 credits)		
Credits		6-9
Semester 3		
HRTM 502 or HRTM 506	Advanced Hospitality Services Management or Contemporary Global Issues in Hospitality	3
HRTM 599		3
HRTM or Specialized Elective		3
Credits		9
Semester 4		
HRTM 599		3-6
HRTM or Specialized Electives		3-6
Credits		6-12
Total Credits		30-39

Suggested Plan of Study

Non-Thesis Option

Semester 1		Credits
HRTM 501	The Hospitality Industry and Sustainable Competitive Strategy	3
Graduate Level Research Methods Course		3
HRTM Graduate Elective		3
Credits		9
Semester 2		
HRTM 502 or HRTM 506	Advanced Hospitality Services Management or Contemporary Global Issues in Hospitality	3
Graduate Level Statistics Course		3
HRTM or Specialized Electives		3
Credits		9
Semester 3		
HRTM 502 or HRTM 506	Advanced Hospitality Services Management or Contemporary Global Issues in Hospitality	3
HRTM or Specialized Elective		3-6
Credits		6-9
Semester 4		
HRTM 515		3
HRTM or Specialized Electives		3-6
Credits		6-9
Total Credits		30-36

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to your HRTM Faculty Mentor about your MAP plan and develop a course plan in consultation with the advisor.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
HRTM Required and Elective Classes Taken At Graduate Level ¹		
HRTM 492	Special Problems	1-4
HRTM 510	Hospitality Cost Control	3
HRTM 512	Beverage Management	3
HRTM 536	Sustainability in the Hospitality Industry	3
HRTM 532	Hotel Revenue and Sales Management	3
HRTM 535	Resort Management	3

¹ Other courses may be used for the MAP requirements with the consent of instructor, including HRTM 501 The Hospitality Industry and Sustainable Competitive Strategy, HRTM 502 Advanced Hospitality Services Management, HRTM 506 Contemporary Global Issues in Hospitality, and HRTM 598 Special Research Programs but will require a degree audit exception through the department/graduate school.

For additional information, please see MAP requirements at:

<https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html>

Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science Non-Thesis Option

Prefix	Title	Credits
NUTR 5150	Orientation to Dietetic Internship	3
AXED 5515	Data Collection and Analysis (or other Statistics course)	3
AXED 5510	Research Methods	3
NUTR 5610	Dietetic Intern Seminar	2
NUTR 5630	Community Nutrition for Dietetic Interns	3
NUTR 5650	Foodservice Management for Dietetic Interns	3
NUTR 5670	Nutrition Care Process for Dietetic Interns	3
NUTR 5620	Dietetic Internship: Supervised Practice in Community Nutrition	3-8
NUTR 5640	DI SUP PRACT FS MGT	3-5
NUTR 5660	Dietetic Internship: Supervised Practice in Clinical Dietetics	3-8
NUTR 5680	Review Course for National RD Exam	3
Total Credits		32-44

Thesis Option

Prefix	Title	Credits
NUTR 5150	Orientation to Dietetic Internship	3
AXED 5515	Data Collection and Analysis (or other Statistics course)	3
AXED 5510	Research Methods (or other Research Methods course)	3
NUTR 5610	Dietetic Intern Seminar	2
NUTR 5630	Community Nutrition for Dietetic Interns	3
NUTR 5650	Foodservice Management for Dietetic Interns	3
NUTR 5670	Nutrition Care Process for Dietetic Interns	3
NUTR 5620	Dietetic Internship: Supervised Practice in Community Nutrition	3-8
NUTR 5640	DI SUP PRACT FS MGT	3-5
NUTR 5660	Dietetic Internship: Supervised Practice in Clinical Dietetics	3-8
NUTR 5680	Review Course for National RD Exam	3
FCSC 599	Master's Thesis	4
Total Credits		36-48

Fine Arts - Master of Fine Arts Emphasis: Studio Art

Art requirements for an MFA degree with an emphasis in studio art include a minimum of 60 credits of academic work, usually completed in three years. Of those 60 credits,

- 9 must be taken in art history,
- 6 in non-art courses numbered 450 or above,
- 6 in ARTS 598 Studio Thesis
- 3 in ARTH 579 Graduate Seminar: Art Theory, Criticism, Historiography
- 12 in ARTS 596 Graduate Studio Seminar.

In order to remain in good standing in the MFA program, a student must maintain an average GPA of 3.0. Any grade lower than B- in an Art Department graduate course is considered failing. In the event that a student fails a required course, they must repeat the class in order to get credit for it. If a student is awarded a graduate assistantship, he or she must maintain an average GPA of 3.0.

Prefix	Title	Credits
Program Requirements		
ARTH 579	Graduate Seminar: Art Theory, Criticism, Historiography	3
ARTS 596	Graduate Studio Seminar	12
ARTS 598	Studio Thesis	6
ARTS Electives (ARTS 500 level)		18
Non-ARTS/Non-ARTH 450 level or higher courses		6
ARTS courses (500 level)		9
Two additional courses, either ARTS 596 or 500-level ARTS Elective		6
Total Credits		60

Semester Reviews

At the end of the first two semesters, each graduate student's creative production will be reviewed by the assembled faculty. Participation in semester reviews are required for successful completion of graduate level studio courses.

Candidacy

Candidacy occurs during the third semester of study in residency. Candidacy consists of a formal review of the student's work by the assembled graduate faculty. The graduate faculty advances the student to his or her final 3 semesters of study by a majority vote. If the faculty does not advance the student, candidacy may be repeated one additional time at the end of the next consecutive semester. The final three semesters of thesis work will commence from that point. Students who are not successful in their second candidacy attempt will be dis-enrolled from the MFA program.

Thesis Committee

At the end of the third semester and after a successful candidacy the student will propose his or her thesis committee, consisting of two department of art graduate faculty members, and one graduate faculty member from outside the department.

Thesis Exhibition

The studio thesis will culminate in an exhibition of the candidate's creative works and a written thesis statement. A successful oral examination and defense of the thesis and exhibition is required for graduation. Two copies of the thesis and a photographic record of the final exhibition are required; other requirements may be determined by the graduate faculty. Students who do not satisfactorily complete their oral examination may not participate in the thesis exhibition.

Thesis exhibitions for the MFA degree will be held in the spring semester in the University Art Museum. Students who wish to graduate at mid-year are obligated to find an exhibition space other than the NMSU Art Museum that meets with the approval of the graduate committee. In this case the student is responsible for making all arrangements for the thesis exhibition.

Fish, Wildlife and Conservation Ecology - Master of Science

The Department of Fish, Wildlife and Conservation Ecology (FWCE) offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. Faculty members in the department also may advise Ph.D. candidates through the graduate programs in the Department of Biology, Department of Animal and Range Sciences, Department of Plant and Environmental Sciences, as well as other Ph.D. granting departments. For additional information please see the graduate catalog entries for the respective departments.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a thesis for most students. Of these credits, at least 15 must be in courses numbered 500 or above, and at least 15 must be for courses with the FWCE prefix. Those programs involving a thesis or research project include 4 to 6 credits of research (FWCE 598 Special Research Programs or FWCE 599 Master's Thesis). Students electing a minor in FWCE are required to take at least 9 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

All students in the program must complete the following requirements:

- A ST 505 Statistical Inference I or equivalent
- A minimum of 3 additional credits from the Quantitative Methods category in addition to A ST 505 Statistical Inference I (eligible courses listed below)
- One course each from the Ecological Concepts, Organismal Biology and Ecological Techniques categories (eligible courses listed below)
- 4 to 9 credits from the Independent Study category (eligible courses listed below)

In addition, a student may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas. Courses other than those listed may be acceptable, given permission by the student's supervisory committee.

Prefix	Title	Credits
Degree Requirements		
A ST 505	Statistical Inference I (or equivalent)	4
Quantitative Methods: Eligible Courses¹		
Select minimum of 3 credits from the following:		3
A ST 503	SAS Basics	
A ST 506	Statistical Inference II	
A ST 507	Advanced Regression	
A ST 515	Statistical Analysis with R	
A ST 550	Special Topics	
FWCE 509	Population Ecology (s)	
FWCE 457	Ecological Biometry	
GEOG 585	Spatial Analysis and Modelling	
Ecological Concepts: Eligible Courses²		
Select one from the following:		3-4
BIOL 467	Evolution	
BIOL 484	Animal Communication	
BIOL 489	Genetic Aspects of Population Biology	
BIOL 568	Communities and Ecosystems	
BIOL 587	Behavioral and Evolutionary Ecology	

BIOL 488	Principles of Conservation Genetics	
FWCE 459	Aquatic Ecology	
FWCE 540	Wildlife Habitat Relationships	
GEOG 557	Fundamentals of Biogeography	
Organismal Biology: Eligible courses²		
Select one from the following:		3-4
FWCE 530	Large Mammal Ecology, Conservation and Management	
FWCE 532	Environmental Biology of Fishes	
FWCE 567	Herpetology	
FWCE 582	Ichthyology	
Ecological Techniques: Eligible courses²		
Select one from the following:		3-4
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	
FWCE 530	Large Mammal Ecology, Conservation and Management	
FWCE 537	Wildlife Damage Management	
FWCE 571	GIS for Natural Resource Scientists	
RGSC 452	Vegetation Measurements for Rangeland Assessment	
RGSC 518	Watershed Methods and Management	
Independent Study: Eligible courses		
Select one from the following:		4-9
FWCE 548	Graduate Problems ²	
FWCE 598	Special Research Programs	
FWCE 599	Master's Thesis	
To meet the 30 credit hour requirements of the MS program, completion of 1 to 2 courses in addition to the requirements described above will be necessary. The additional course(s) must be approved by the graduate student's supervisory committee.		2-10
Total Credits		30

¹ Other courses, particularly in Applied Statistics, may be eligible with consent of the advisory committee.

² Other courses may be eligible to fulfill course requirements with consent of the advisory committee. Students may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas.

Graduate work in the department is intended to prepare students for careers in research, teaching, extension and management. Facilities available to graduate students include two ranches of approximately 90,000 acres, a large suite of shared laboratories, and a large fish-culture facility. We actively cooperate with state and federal natural resource management agencies, and graduate students have access to national forests and extensive public lands, as well as the Jornada Basin Long-Term Ecological Research site and associated databases (see <http://jornada-www.nmsu.edu> for details). Additional research opportunities for graduate students are available in the New Mexico Cooperative Fish and Wildlife Research Unit, located in the department since 1988.

Additional information on the graduate program and faculty is available at <http://aces.nmsu.edu/academics/fws/>. (<http://aces.nmsu.edu/academics/fws/>)

Geography - Master of Applied Geography

The basic requirement for the Master of Applied Geography is a minimum of 30 graduate credits, including 6 thesis credits and a successful thesis defense. Students choosing the thesis option are required to file a digital copy of the thesis and thesis data that will be archived on the Departmental Website (<https://geography.nmsu.edu/>) and the Departmental server. A non-thesis option (residency) requires 36 graduate credits with a minimum of 3 credits of professional residency and an approved final residency report. Students choosing the non-thesis (residency) option are required to file a digital copy of their residency report that will be archived on the Departmental Website and the Departmental server. All candidates must maintain an overall GPA of 3.00 or higher. All candidates must also receive a grade of B or better in the following required courses: GEOG 501 Research Design and History of Geographic Thought; GEOG 585 Spatial Analysis and Modelling; and one graduate-level GIS&T course, either prior to entering the program or before graduation. A total of at least 15 credits must be earned in courses numbered 500 and above, and no more than 9 credits of the 30 (thesis option) or 36 (non-thesis option) can be earned outside of geography.

Geology - Master of Science

A candidate for a master's degree must:

- Complete a minimum of 30 graduate credits, including a minimum of 6 credits for thesis (GEOL 599 Master's Thesis).
 - No more than 5 thesis credits may be taken in any one semester. Early selection of a research advisor is encouraged.
- A thesis proposal must be approved by the advisor and the candidate's committee before registering for thesis credits.
- At least 15 credits must be earned in courses numbered 500 or above, and at least 15 credits must be earned in geology.
- Students are expected to participate in the department's colloquium each semester.

The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, geochronology, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory, plus computer, geochemical and petrographic labs. Major equipment includes a Gemini heavy mineral separation table, X-Ray Fluorescence Spectrometry (XRF), Laser-Induced Breakdown Spectroscopy (LIBS), a class 1000 clean lab, Thermal Ionization Mass Spectrometry (TIMS) and Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LA-MC-ICP-MS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor.

Government - Master of Arts

The MA program provides general course work in each of the major fields of political science. Students may choose either the thesis option, under which they complete 30 credits of course work plus 6 thesis credits (POLS 599 Master's Thesis), or the nonthesis option, with 30 credits of course work plus 6 hours of special research credit (POLS 598 Special Research Programs) or 6 hours of approved internship credit (POLS 510 Internship). Both the thesis and nonthesis options require a final oral

examination; the non thesis option requires a written examination as well. The program provides a broad-based foundation in political science while allowing students to pursue specific areas of interest.

Requirements

Flexibility in planning a program of study is permitted to meet the educational needs of a diverse student population. Structured areas of emphasis are available in several topical areas, including Latin American and international affairs. Students may also take a graduate minor in Security Studies. Information on these areas and the graduate minor may be obtained from the Department of Government. No more than 9 credits taken outside the department will be counted toward the degree.

Prefix	Title	Credits
Requirements		
POLS 502	Research Methods in Government	3
or POLS 503	Qualitative Research Methods	
Select three from the following:		9
POLS 530	Seminar in Public Policy	
POLS 550	Seminar in American Politics	
POLS 560	Seminar in International Relations Theory	
POLS 570	Seminar in Comparative Politics	
POLS 580	Seminar in Political Theory	
Additional credits subject to advisor approval ¹		18
Thesis/Non-Thesis		
Select one from the following:		6
POLS 599	Master's Thesis	
POLS 598	Special Research Programs	
or POLS 510	Internship	
Total Credits		36

¹ The remaining credits required for the degree are selected subject to advisor approval to satisfy particular academic interests or career goals.

History - Master of Arts

Thesis Program

Thirty-six credits (27 of which must be at the 500 level) are required for the thesis program:

Prefix	Title	Credits
Select at least 3 credits from Public History courses above the 500 level		
Select four History Graduate Seminars including the following:		3
HIST 598	Craft of History	3
Select two from the following:		6
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 593	Reading Seminar: History, Myth and Memory	
HIST 596	Research Seminar	3
Select a maximum of 6 credits in related fields outside the Department of History ¹		6
Select 9 credits at the 500-level or above in the Department of History		9

HIST 599	Master's Thesis	6
Total Credits		36

¹ With permission of the graduate advisor, a maximum of 6 credits may be taken in related fields from courses numbered 450 and above outside the Department of History.

A student choosing the thesis program must receive permission for his/her thesis by passing a thesis proposal defense after earning 12 graduate credits in History. The department will provide guidelines for the thesis defense. Students who choose the thesis program must pass a final oral examination over their graduate course work and their thesis. All graduate students will be required to present a research paper in a public forum approved by the department's Graduate Director.

Dual Track M.A. (Public History and Thesis)

Students choosing to pursue both the thesis track and Public History concentration must complete the course hours required for the public history concentration, perform an internship, and defend the proposed thesis before undertaking it using guidelines provided by the department, present the public history portfolio at a public presentation, complete the thesis, and defend their course work, thesis and public history portfolio at a final oral examination. In order to satisfactorily complete both programs, such students would complete 39 credits, including three hours of internship credit and six hours of thesis work.

Prefix	Title	Credits
Select four History Graduate Seminars including the following:		
HIST 594	Public History	3
HIST 598	Craft of History	3
HIST 596	Research Seminar	3
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 593	Reading Seminar: History, Myth and Memory	
HIST 585	Public History Internship	3
Select a maximum of 9 credits (450-and above) outside the Department of History ²		9
Preparation of an article of scholarly quality		3
Select 3 credits at the 500 level from courses in the Department of History		3
HIST 599	Master's Thesis	6
Total Credits		36

History (Public History) - Master of Arts

Thirty-six credits (27 of which must be at the 500 level) are required for the Public History concentration:

Prefix	Title	Credits
Select four History Graduate Seminars including the following:		
HIST 594	Public History	3
HIST 598	Craft of History	3

HIST 596 Research Seminar	3
Select one from the following:	3
HIST 590 Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591 Reading Seminar: Modernity and its Discontents	
HIST 592 Reading Seminar: Nature and Society	
HIST 593 Reading Seminar: History, Myth and Memory	
HIST 585 Public History Internship	3
Select a maximum of 9 credits (numbered 450 and above) outside the Department of History ¹	9
Preparation of an article of scholarly quality	3
Select 9 credits from courses numbered 500 and above in the Department of History	9
Total Credits	36

¹ Requires the permission of the Director of the Public History Program

Students in the Public History concentration must collectively pass 18 credits of nonpublic history courses, including the nonpublic history seminars noted above. They must collectively pass 18 credits in public history, which must include the public history seminar, the internship, and the article. The scholarly article is developed through work in the internship and will be of peer reviewed journal quality. The public history credits may include a maximum of 9 graduate level (450 -and-above) credits outside the Department of History with permission of the Director of the Public History Program. A student choosing the Public History concentration must pass an article proposal defense about the proposed scholarly article during the first semester after completion of the internship. The department will provide guidelines for the article defense. A student choosing the Public History specialization must give a public presentation of a portfolio that includes his/her work and the scholarly article, and must pass an oral examination over graduate course work, the internship, and the article. Students who receive a Master's degree in this track will have a specialization in Public History added to their transcripts.

Horticulture - Master of Science

The Master of Science degree can be obtained through either a thesis option (recommended) or a non-thesis option. Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University. Qualifications for admission will be reviewed by the departmental graduate faculty.

Minimum Grade Point Average and Credit Hour Requirements: Your Master's degree requires a minimum of 30 completed degree hours and a minimum cumulative GPA of 3.00 in all course work.

Degree residency requirement: 15 credits must be completed at NMSU.

Thesis Option

Prefix	Title	Credits
Departmental Requirements		
<i>Selection of courses should be based on consultation with the student's graduate committee</i>		
AGRO/HORT/SOIL 590	Graduate Seminar (taken final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		23-25

AGRO/HORT/ENVS 599	Master's Thesis (taken during final year)	4-6
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Complete a final oral defense of the written thesis and a general examination of the student's field of study

Total Credits **30**

See the PES Graduate Handbook (https://pes.nmsu.edu/documents/NMSU_PES_GraduateStudiesHandbook_final83020221.pdf) for additional details.

Non-Thesis Option

Prefix	Title	Credits
Departmental Requirements		
<i>Selection of courses should be based on consultation with the student's graduate committee</i>		
AGRO/HORT/SOIL 590	Graduate Seminar (taken final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		29
Complete a written research report on an area of investigation conducted by the student.		
Complete a final oral defense of the written report and a general examination of the student's field of study		
Total Credits		30

Industrial Engineering - Master of Engineering in Industrial Engineering

The Department of Industrial Engineering offers the Master of Engineering (M.E. in IE) as the coursework-only degree. It is a Professional Master's degree targeting a working professional who wants to pursue a Master's degree in Industrial Engineering at New Mexico State University.

The program of study leading to the M.E. in IE degree consists of 30 credits. At least 50% of the course work must be taken from the Approved IE Department Course List. This means that students can take up to five electives from engineering disciplines outside the department and/or other areas of interest outside the college.

The M.E in IE degree is also offered by distance education for qualified applicants. The courses with section numbers M70 - M79 are designated as online.

Although there is no oral exam, students will be required to complete an exit interview with an IE faculty member.

Note that NMSU reserves the right to change the program requirements without prior notice. Information in the NMSU Graduate Catalog takes precedence over any other information.

Selection of Advisor

During the first 12 credit hours in the Industrial Engineering Graduate Program, all master's degree students must select a permanent advisor. This must be done prior to registration for the fifth course the student takes. In selecting an advisor, the student should communicate with several members of our graduate faculty to discuss specific program objectives. The student should also use these contacts to become familiar with faculty research projects that are currently in progress. The faculty member must consent to serve as the student's advisor in writing.

A list of the graduate faculty of the department with their areas of interest is found on the IE web page at <https://ie.nmsu.edu/>.

Submission of Programs

After completing 12 credits of graduate coursework, a permanent "Program of Study for Masters Students" form must be submitted to the Graduate School. Acceptance of this program admits the student to candidacy for the degree.

Prefix	Title	Credits
Approved IE Department Course List (Note that courses are listed under their area of primary focus but may address other areas. See course descriptions for more details.)		
<i>Operations Research</i>		
IE 515	Stochastic Processes Modeling	3
IE 522	Queuing Systems	3
IE 525	Systems Synthesis and Design	3
IE 533	Linear Programming	3
IE 534	Nonlinear Programming	3
IE 535	Discrete Optimization	3
IE 567	Design and Implementation of Discrete-Event Simulation	3
<i>Applied Statistics</i>		
IE 460	Evaluation of Engineering Data	3
IE 466	Reliability	3
IE 545	Characterizing Time-Dependent Engineering Data	3
<i>Design and Manufacturing</i>		
IE 478	Facilities Planning and Design	3
IE 524	Advanced Production and Inventory Control	3
IE 571	Advanced Quality Control	3
IE 575	Advanced Manufacturing Processes	3
<i>Engineering Management</i>		
IE 523	Advanced Engineering Economy	3
IE 530	Environmental Management Seminar	1
IE 537	Large Scale Systems Engineering	3
IE 561	Advanced Safety Engineering	3
IE 563	Topics in Engineering Administration	3
<i>Depending on contents, the following course is applicable to any of the above four areas:</i>		
IE 590	Selected Topics	1-3
Optional Electives ¹		
E E 500-level (With approval of advisor and instructor)		
M E 500-level (With approval of advisor and instructor)		
C E 500-level (With approval of advisor and instructor)		
ACCT 500-level (With approval of advisor and instructor)		
BCIS 500-level (With approval of advisor and instructor)		
BFIN 500-level (With approval of advisor and instructor)		
MGMT 500-level (With approval of advisor and instructor)		
ECON 500-level (With approval of advisor and instructor)		
C S 500-level (With approval of advisor and instructor)		
MATH 500-level (With approval of advisor and instructor)		
STAT 500-level (With approval of advisor and instructor)		
A ST 500-level (With approval of advisor and instructor)		

- ¹ The optional courses outside the department and/or the college should be previously approved by the academic advisor. See your advisor for more detailed information about selecting elective courses.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of approved I E courses and get dual course credit that can be applied to both an undergraduate and master's degree. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other I E 500+ courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
IE 451	Engineering Economy	3
IE 460	Evaluation of Engineering Data	3
IE 467	Discrete-Event Simulation Modeling	3
IE 478	Facilities Planning and Design	3
IE 490	Selected Topics	3
IE 590	Selected Topics	3

Industrial Engineering - Master of Science in Industrial Engineering

The Department of Industrial Engineering offers the Master of Science (M.S.) in Industrial Engineering with focus areas of manufacturing, operations research, and engineering management. Students may choose one of two options for completing their M.S. degree and the requirements for each option are listed below:

- Thesis option:** 24 credits of course work plus 6 credits of I E 599 Master's Thesis.

- **Project Option:** 27 credits of course work plus 3 credits of I E 598 Special Research Programs.

Whether students write a thesis or complete a project, the program of study leading to the M.S. degree consists of 30 credits. At least 50% of the course work must be taken from the Approved IE Department Course List. This means that students can take up to five electives from engineering disciplines outside the department and/or other areas of interest outside the college.

Note that NMSU reserves the right to change the program requirements without prior notice. Information in the NMSU Graduate Catalog takes precedence over any other information.

Selection of Advisor

During the first 12 credit hours in the Industrial Engineering Graduate Program, all master's degree students must select a permanent advisor. This must be done prior to registration for the fifth course that the student takes. In selecting an advisor, the student should communicate with several members of the IE graduate faculty to discuss specific program objectives. The student should also use these contacts to become familiar with faculty research projects that are currently in progress. The faculty member must consent to serve as the student's advisor in writing. A list of the department graduate faculty along with their areas of interest is found on the IE web page (<https://ie.nmsu.edu/>).

Submission of Programs

After completing 12 credits of graduate coursework, a permanent "Program of Study" form must be submitted to the Graduate School. Acceptance of this program admits the student to candidacy for the degree.

Prefix	Title	Credits
Master's Thesis		
I E 599	Master's Thesis	6
Master's Project		
I E 598	Special Research Programs	3

Approved IE Department Course List (Note that courses are listed under their area of primary focus but may address other areas. See course descriptions for more details.)

<i>Operations Research</i>		
I E 515	Stochastic Processes Modeling	
I E 522	Queuing Systems	
I E 525	Systems Synthesis and Design	
I E 533	Linear Programming	
I E 534	Nonlinear Programming	
I E 535	Discrete Optimization	
I E 567	Design and Implementation of Discrete-Event Simulation	
<i>Applied Statistics</i>		
I E 460	Evaluation of Engineering Data	
I E 466	Reliability	
I E 545	Characterizing Time-Dependent Engineering Data	
<i>Design and Manufacturing</i>		
I E 478	Facilities Planning and Design	
I E 524	Advanced Production and Inventory Control	
I E 571	Advanced Quality Control	
I E 575	Advanced Manufacturing Processes	
<i>Engineering Management</i>		

I E 523	Advanced Engineering Economy
I E 530	Environmental Management Seminar
I E 537	Large Scale Systems Engineering
I E 561	Advanced Safety Engineering
I E 563	Topics in Engineering Administration

Depending on contents, the following two courses are applicable to any of the above four areas:

I E 505	Directed Readings
I E 590	Selected Topics

Optional Electives ¹

E E 500-level (With approval of advisor and instructor)
M E 500-level (With approval of advisor and instructor)
C E 500-level (With approval of advisor and instructor)
ACCT 500-level (With approval of advisor and instructor)
BCIS 500-level (With approval of advisor and instructor)
BFIN 500-level (With approval of advisor and instructor)
MGMT 500-level (With approval of advisor and instructor)
ECON 500-level (With approval of advisor and instructor)
C S 500-level (With approval of advisor and instructor)
MATH 500-level (With approval of advisor and instructor)
STAT 500-level (With approval of advisor and instructor)
A ST 500-level (With approval of advisor and instructor)

¹ The optional courses outside the department and/or the college should be previously approved by the academic advisor. See your advisor for more detailed information about selecting elective courses.

Requirements for Graduation

It is the responsibility of the student to complete all forms before submitting them to the IE department. Blank forms will not be accepted.

1. **Application for Diploma (Degree)** At the start of the semester in which you are to graduate you must file an Application for Diploma (Degree) and fee with the NMSU Registrar Office. To find the application as well as deadlines, log onto MyNMSU (<https://my.nmsu.edu/>) and click on the Student and Financial Aid tab, then under QuickLinks select Student Records. Filing dates are on the Graduate School Calendar that is maintained on the Graduate School website.
2. **Program of Study** – After you have completed 12 NMSU credits, you are required to complete a form entitled Program of Study for Masters Students. This form is found on the NMSU Graduate School (<https://gradschool.nmsu.edu/>) web page: Under the "Current Students" pull-down menu at the top, choose "Graduate Forms"
3. **Schedule Your Master's Exam** – Whether you write a thesis, complete a project or take all course work, you must schedule a final examination during the last semester of your course work/research. Examination committee rules are in the Graduate Catalog: You should plan to have your adviser, a second IE graduate faculty member, and an external (outside the IE department) faculty member. The external member will also serve as the Dean of the Graduate School's Representative. To ensure that a Faculty Member is currently a member of the Graduate Faculty and their appointment expiration date please visit Graduate Faculty & Staff Directory on the Graduate School (<https://gradschool.nmsu.edu/>) web page: Under the "Faculty and Staff" pull-down menu at the top, choose "Graduate Faculty & Staff Directory". The schedule dates are found on the Graduate School (<https://gradschool.nmsu.edu/>) web page: Under the "Current Students" pull-down menu at the top, choose "Graduate School Calendar".

4. **Other Forms** – Additional forms can be found on the Graduate School website (<http://gradschool.nmsu.edu/>).

To schedule and take your exam:

- Schedule a 2-hour time block that is convenient for you and your selected faculty committee. **Students are responsible for contacting and scheduling their committee members.**
- Schedule use of the IE Conference Room, Room 279 EC III, with the Industrial Engineering Secretary. At that time, if you are presenting a project or thesis, schedule the use of any equipment you may require such as the In Focus projector, laptop, etc.
- Complete the Masters Final Examination Form. The exam form is also available on the Graduate School (<https://gradschool.nmsu.edu/>) website. You must schedule your exam a minimum of 10 working days in advance. This means your form must be at the Graduate School at that time.
- Consult with your adviser to discuss your examination. This can be by phone or e-mail.
- Be on time for your examination. If you're using equipment for presenting research, you should arrive early to set up.

Please plan to attend, with your family and friends, the College of Engineering's Sociedad de Ingenieros ceremony that is held to recognize our engineering graduates. This ceremony is held the Friday evening before Graduation.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of approved I E courses and get dual course credit that can be applied to both an undergraduate and master's degree. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other I E 500+ courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
I E 451	Engineering Economy	3
I E 460	Evaluation of Engineering Data	3
I E 467	Discrete-Event Simulation Modeling	3
I E 478	Facilities Planning and Design	3
I E 490	Selected Topics	3
I E 590	Selected Topics	3

Mathematics - Master of Science

The Master's degree is designed to increase one's knowledge and understanding of mathematics beyond the Bachelor's degree level. It also prepares a student for future graduate work.

A candidate for a master's degree may select up to two minors in addition to the major. A minimum of 8 credits of graduate work is necessary for a minor.

Minimum Requirements for the Master's Degree

1. In fulfillment of the Graduate School requirement of a minimum of 30 semester credits of course work, the student must take at least 24 credits of mathematics or statistics from the courses listed below.
2. The student's program of study must be approved by the departmental Graduate Studies Committee.
3. The student must successfully complete a master's written examination and final master's oral examination.

Prefix	Title	Credits
Minimum Requirements		
<i>Complete each of the following (12 credits):</i>		
MATH 525	Advanced Linear Algebra	3
MATH 526	Abstract Algebra I: Groups and Rings	3
MATH 527	Introduction to Real Analysis I	3
MATH 528	Introduction to Real Analysis II	3
<i>Complete two of the following:</i>		6
MATH 520	Introduction to Topology	
MATH 524	Logic and Set Theory	
MATH 529	Complex Analysis	
STAT 515	Probability: Theory and Applications	
STAT 525	Statistics: Theory and Applications	
STAT 535	Elementary Stochastic Processes	
<i>Complete two of the following</i>		6
MATH 541	Topology I	
MATH 542	Topology II	
MATH 551	Mathematical Structures in Logic	
MATH 552	Universal Algebra and Model Theory	
MATH 571	Partial Differential Equations I	
MATH 572	Partial Differential Equations II	
MATH 581	Abstract Algebra II: Fields, Rings and Modules	
MATH 582	Module Theory and Homological Algebra	
MATH 583	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 593	Measure and Integration	
MATH 594	Real Analysis	
MATH 595	Introduction to Functional Analysis	
STAT 562	Foundations of Probability	
STAT 571	Continuous Multivariate Analysis	

STAT 572	Linear Models
STAT 581	Advanced Theory of Statistics I
STAT 582	Advanced Theory of Statistics II
<hr/>	
Total Credits	24

The Master's Written Examination

Candidates for the Master's in Mathematics must pass a written exam, offered at the end of the Fall and Spring semesters, based on the content of MATH 525 and MATH 527. Full-time students need to pass the written Master's exam no later than the Summer following their completion of MATH 525 and MATH 527, or the start of their fourth semester in the program, whichever comes first. Graduate assistants must adhere to this timetable. Any second try must be passed within one semester of the first.

The Master's Final Examination

The Master's final examination is an oral examination administered by the student's committee. The exam consists of a short presentation made by the student on a topic covered in the student's coursework, followed by an examination by the committee based on the presentation and related coursework in the student's program of study. When a Master's thesis has been written, the presentation and examination is based on the student's thesis. The student's committee consists of at least three departmental members and a Graduate faculty member from another department who serves as the Dean's representative. The oral exam must be completed at least 10 days prior to the end of the semester in which the candidate wishes to receive the degree.

Mechanical Engineering - Master of Engineering in Mechanical Engineering

The Mechanical Engineering Masters of Engineering degree is a coursework-based graduate degree that requires neither a thesis nor a project.

(30 credits)

Prefix	Title	Credits
Requirements		
M E 570	Engineering Analysis I	3
Core Courses		
Select one course from each of the following 4 topic areas: ¹		12
<i>Solid Mechanics</i>		
Select one from the following:		
M E 502	Elasticity I	
M E 504	Continuum Mechanics	
<i>Thermal Science</i>		
Select one from the following:		
M E 503	Thermodynamics	
M E 540	Intermediate Heat Transfer	
<i>Fluids</i>		
Select one from the following:		
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
<i>Dynamics and Vibrations</i>		
Select one from the following:		

M E 511	Dynamics
M E 512	Vibrations
<i>Engineering Analysis and Control</i>	
Select one from the following:	
M E 518	Finite Element Analysis
M E 527	Linear Systems Theory
M E 580	Engineering Analysis II
Additional Requirements	
Select three courses (500 level or above) from any departments and two courses (500 level or above) from any college: ²	
Total Credits	

¹ Graduate A E courses may be substituted for M E courses with the approval of the Graduate Program Coordinator.

² If course is not in A E or M E program, approval of the Graduate Program Coordinator is required.

Academic Advisor and Final Exit Survey

Newly admitted Mechanical Engineering Masters of Engineering students will be assigned the Graduate Program Coordinator as an academic advisor.

All students must take Professional Master's Degree Exit Survey to graduate, which will be conducted by the Graduate Program Coordinator and will be taken after completing all coursework.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the

additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
M E 452	Control System Design	3
M E 456	Experimental Modal Analysis	3
M E 460	Applied Finite Elements	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3
M E 504	Continuum Mechanics	3

Mechanical Engineering - Master of Science in Mechanical Engineering

(30 credits)

Thesis Option

Prefix	Title	Credits
Requirements		
M E 570	Engineering Analysis I	3
Select at least 18 credits of M E graduate courses ¹		18
M E 599	Master's Thesis	6
Select one or both from the following:		3
M E 509	Individualized Study	
M E 598	Special Research Programs	
Total Credits		30

¹ Up to 6 credits of A E graduate courses may be substituted with the approval of the Graduate Coordinator. All course must be 500 level or above. The program of study may include up to 6 credits of M E 510 (special topics courses offered formally on a one-time basis) with the approval of the Graduate Coordinator.

Publication Requirement: a refereed conference paper accepted or a refereed journal article in review or accepted by graduation. The M.S. thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

Selection of Permanent Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and a permanent advisor before registering for the second semester.

When considering a decision about a degree option and an advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all thesis work.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two

years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
M E 452	Control System Design	3
M E 456	Experimental Modal Analysis	3
M E 460	Applied Finite Elements	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3
M E 504	Continuum Mechanics	3

Molecular Biology - Master of Science

The MB program offers curricula leading to the MS and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MB Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 300 combined verbal and quantitative), TOEFL scores of foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding

research performance or potential are weighted heavily during the selection process.

Students with a BS degree in one of the disciplines listed above can expect to earn the MS degree in about 30 credits, including at least 6 credits of thesis research. Because research is central in both the MS and Ph.D. curricula, early selection of a research advisor is required. The master's committee is organized to assist in planning a program appropriate to the background and goals of the student. A final, formal presentation and oral defense of the original research documented in the MS thesis completes the degree requirements.

MS candidates must enroll in MOLB 599 Master's Thesis for 6 credits. May register for additional credits to maintain full-time status.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs. The MAP program allows undergraduate students to take graduate courses and count up to twelve credits toward both undergraduate and graduate degrees in COMM.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.25.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

Undergraduate students majoring in Genetics, Biochemistry, and Biology would be the most qualified to enter the Masters Accelerated Program. The courses that can be taken during the student's last two years of their BS degree program prior to graduation, and as a full graduate student are listed below. Students may only take a maximum of 12 credit hours towards their MAP.

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
Students may count a maximum of two of the following 450-499 level courses towards their MAP		
BIOL 470	Developmental Biology	
BIOL 474	Immunology	

BIOL 475	Virology
BIOL 478	Molecular Biology of Microorganisms
EPWS 486	Plant Virology
GENE 486	Genes and Genomes
GENE 488	Gene Regulation
Courses 500-599 level that may be taken for MAP	
BIOL 540	Science and Ethics
MOLB 542	Biochemistry I
MOLB 520	Molecular Cell Biology
MOLB 550	Topics in Molecular Biology

Qualifications for students entering the MAP program include all NMSU guidelines including a GPA of 3.2. Students who complete MAP in Molecular Biology will be expected to meet all of the requirements of the program for entry into the Molecular Biology and Interdisciplinary Program Graduate Program to complete their graduate degree. (GRE score will be waived for MAP) These requirements can be found at <https://molb.nmsu.edu/how-to-apply/>. The MOLB-ILS program does not have a non-thesis option so all MS students in the program perform research that culminates to a published thesis.

MPA-MCJ Program - Dual Degree

The MPA-MCJ joint degree option requires completion of a minimum of 57 credits of approved course work from the Departments of Government and Criminal Justice. Students interested in this option should meet with the MPA director or criminal justice graduate advisor for additional information.

Music (Conducting) - Master of Music

Prefix	Title	Credits
Required Courses		
MUSC 471	Graduate Theory Review ¹	3
MUSC 477	Graduate Music History Review ¹	3
MUSC 578	Advanced Choral Literature	2
or MUSC 579	Advanced Instrumental Literature	
	Music Theory	3
	Music History and Literature	3
	Conducting	9
MUSC 450	Research Methods	3
MUSC 580	Ensemble Performance	1
MUSC 540	Graduate Recital/Analytical Paper	4
Total Credits		31

¹ Students must make a B or better before taking additional music theory/music history courses.

Music (Music Education) - Master of Music

Requirements

Students must make the grade of B or better in a course for it to count toward degree completion.

Prefix	Title	Credits
Required Courses		
MUSC 471	Graduate Theory Review ¹	3

MUSC 477	Graduate Music History Review ¹	3
Music Theory		3
Music History and Literature		3
Music Education		9
Approved Elective		3
MUSC 450	Research Methods	3
MUSC 598	Special Research Programs	4
or MUSC 599	Master's Thesis	
Total Credits		31

¹ Students must make a B or better before taking additional music theory/music history courses.

Music (Performance) - Master of Music

Prefix	Title	Credits
Requirements		
MUSC 471	Graduate Theory Review ¹	3
MUSC 477	Graduate Music History Review ¹	3
Music Theory		3
Music History and Literature		3
Applied		8
Pedagogy and Literature		4
MUSC 450	Research Methods	3
MUSC 580	Ensemble Performance	1
MUSC 540	Graduate Recital/Analytical Paper	4
Total Credits		32

¹ Students must make a B or better before taking additional music theory/music history courses.

Physics - Master of Science

The Master's degree requires that students either pass the qualifying examination at the Master's level or identify a research advisor during the first semester of study, form a Graduate Committee, and write a thesis. For the master's degree, students must also successfully complete or transfer at least 30 course credits and pass a final oral examination or the doctoral comprehensive examination. Of these 30 credits, at least 21 must be in physics/geophysics, at most 3 may be for individual study or other informal courses, at most 6 may be for a thesis, and at most 9 may be numbered between 450 and 499. Students must successfully complete

Prefix	Title	Credits
PHYS 576	Advanced Computational Physics I	3
or PHYS 476	Computational Physics	
Select 3 credits from the following:		3
PHYS 571	Advanced Experimental Optics	
PHYS 575	Advanced Physics Laboratory	
PHYS 593	Advanced Experimental Nuclear Physics	

A Master's thesis is optional for students who have passed the qualifying examination. PHYS 599 Master's Thesis credits will not count toward the 21 credits in physics/geophysics and can only be counted toward the 30 credits for a Master's degree if a student selects the thesis option and

successfully defends a Master's thesis. PHYS 700 Doctoral Dissertation credits can be used as a substitute for PHYS 599 Master's Thesis credits.

Physics (Space Physics) - Master of Science

Requirements

For the master's degree with a concentration in Space Physics, students must successfully complete the following physics core and specialized courses:

Prefix	Title	Credits
Physics Core		
PHYS 551	Classical Mechanics	3
PHYS 593	Advanced Experimental Nuclear Physics	3
PHYS 511	Mathematical Methods of Physics I	3
or PHYS 495	Mathematical Methods of Physics I	
PHYS 597	Space Plasma Physics	3
PHYS 554	Quantum Mechanics I	3
or PHYS 454	Intermediate Modern Physics I	
PHYS 561	Electromagnetic Theory I	3
or PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 584	Statistical Mechanics	3
or PHYS 480	Thermodynamics	
Specialization Electives		
Select a minimum of three from the following:		9
ASTR 535	Observational Techniques	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
E E 460	Space System Mission Design and Analysis	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
PHYS 576	Advanced Computational Physics I	
or PHYS 476	Computational Physics	
PHYS 591	Advanced High-Energy Physics I	
Total Credits		30

Plant and Environmental Science - Master of Science

The Master of Science degree can be obtained through either a thesis option (recommended) or a non-thesis option. Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University. Qualifications for admission will be reviewed by the departmental graduate faculty.

Minimum Grade Point Average and Credit Hour Requirements: Your Master's degree requires a minimum of 30 completed degree hours and a minimum cumulative GPA of 3.00 in all course work.

Degree residency requirement: 15 credits must be completed at NMSU.

Thesis Option

Prefix	Title	Credits
Departmental Requirements		
Selection of courses should be based on consultation with the student's graduate committee		

AGRO/HORT/SOIL 590	Graduate Seminar (taken in final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		23-25
AGRO/HORT/ENVS 599	Master's Thesis (taken in final year)	4-6
Complete a written thesis		
Complete a final oral defense of the written thesis and a general examination of the student's field of study		
Total Credits		30

See the PES Graduate Handbook (https://pes.nmsu.edu/documents/NMSU_PES_GraduateStudiesHandbook_final83020221.pdf) for additional details.

Non-Thesis Option

Prefix	Title	Credits
Departmental Requirements		
<i>Selection of courses should be based on consultation with the student's graduate committee</i>		
AGRO/HORT/SOIL 590	Graduate Seminar (taken in final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		29
Complete a written research report on an area of investigation conducted by the student.		
Complete a final oral defense of the research report and a general examination of the student's field of study.		
Total Credits		30

See the PES Graduate Handbook (<https://aces.nmsu.edu/academics/pes/pes-graduate-handbook.html>) for additional details.

Public Administration - Master of Public Administration

The MPA program is accredited by NASPAA. The MPA is designed to provide students with the managerial and analytical skills, in addition to ethical and professional values, necessary to meet the increased demand for skilled public administrators. Candidates who follow this professional program must complete a minimum of 42 credits, consisting of core courses, electives and either an internship or a thesis.

Requirements

Because students have divergent career goals, a thesis or internship option is offered. The thesis option requires an additional 18 credits of course work, 6 credits of thesis (POLS 599 Master's Thesis), and a written examination covering the thesis and course work. The internship option also requires an additional 18 credits of course work, 3 credits of internship (POLS 510 Internship), and a written examination covering the internship and course work. Students who fail their written examination must take an oral exam. As part of the course work, students selecting the internship option must take POLS 519 Proseminar in Public Administration (3 credits that count toward the 42 total) during the latter part of their studies, and are required to earn a B- grade or higher in that course.

With approval, students may include up to 12 credits of relevant course work from other departments to be counted toward the total credits

required for the MPA. These credits may be selected to form a graduate minor in another academic discipline.

Prefix	Title	Credits
Core Courses		
POLS 502	Research Methods in Government	3
POLS 541	Public Budgeting	3
POLS 542	Public Sector Human Resources Management	3
POLS 544	Public Policy Analysis	3
POLS 547	Government Organizations	3
POLS 549	Ethics in Government	3
Thesis Option		
Select one from the following:		24
<i>Thesis</i>		
POLS 599	Master's Thesis	
Select 18 credits of additional course work		
<i>Internship and Capstone Option 2</i>		
POLS 510	Internship	
Select 18 credits of additional course work		
POLS 519	Proseminar in Public Administration	
Total Credits		42

Candidates with inadequate preparation for graduate study in public administration may be required to take appropriate undergraduate and graduate courses as part of, or in addition to, a regular program of study. Applicants to the MPA program will be advised of any such requirements at the time of admission.

Public Health (Health Behavior and Health Promotion) - Master of Public Health

Students completing the Health Behavior & Health Promotion concentration are eligible to sit for the Certified Health Education Specialist (CHES) examination and/or for the Certified Public Health (CPH) examination.

Thesis Option

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
Concentration: Health Behavior & Health Promotion		
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5240	Health Program Planning	3
PHLS 5250	Evaluative Approaches in Public Health	3
PHLS 5260	Research and Resources in Community Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5660		3

Additional Requirements

PHLS 5998	Field Experience	3
PHLS 5999	Master's Thesis	6
Total Credits		42

Final examination for the thesis option consists of an oral defense of the thesis and related course work.

Non-Thesis Option

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
Health Behavior & Health Promotion Concentration		
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5240	Health Program Planning	3
PHLS 5250	Evaluative Approaches in Public Health	3
PHLS 5260	Research and Resources in Community Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5660		3
Additional Requirements		
PHLS 5998	Field Experience	3
Electives		6
Integrative Learning Experience		
Total Credits		42

Elective courses may include other 5000-level courses from other departments. Some PHLS 5000 level courses are cross listed with PHLS 4000 level courses (e.g. PHLS 4640 Rural Health Issues and PHLS 5640 Rural Health Issues). Students who have previously taken one of these 4000 level courses at NMSU, may not take the corresponding 5000 level PHLS course for degree completion credit.

Selected elective and option courses may also be available during summer sessions.

All MPH students must comply with the Student Code of Conduct for the Department of Public Health Sciences. This can be found online at the Department's web page. (<http://publichealth.nmsu.edu> (<https://publichealth.nmsu.edu>))

Non-Thesis students must complete an Integrative Learning Experience that allows them to demonstrate a synthesis of foundational and concentration competencies. This also serves as the final exam for Graduate School Requirements.

Thesis Option

A Suggested Plan of Study

Visit with an advisor for help with creating a customized plan.

Non-Thesis Option

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan.

First Year

Fall		Credits
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5140	Health Services System: Administration and Organization	3
Credits		9
Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5260	Research and Resources in Community Health	3
Credits		9
Summer		
PHLS 5998	Field Experience	3
Cultural Foundation Course or Elective ¹		3
Credits		6

Second Year

Fall		
PHLS 5250	Evaluative Approaches in Public Health ²	3
PHLS 5240	Health Program Planning	3
Cultural Foundation Course or Elective		3
Complete Integrative Learning Experience		
Credits		9
Spring		
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
Cultural Foundation Course or Elective ³		3
Credits		9
Total Credits		42

¹ Elective courses may include 5000-level courses from other departments. Some PHLS 5000-level courses are cross-listed with PHLS 4000 level courses (e.g. PHLS 4640 Rural Health Issues and PHLS 5640 Rural Health Issues). Students who have previously taken one of these 4000-level courses at NMSU may not take the corresponding 5000-level course for degree completion credit. Selected elective and optional courses may also be available during summer sessions.

² PHLS 5210 Foundations & Techniques of Public Health Education is a prerequisite for PHLS 5250 Evaluative Approaches in Public Health

³ Select three credits from the cultural foundation series numbered PHLS 5610-PHLS 5660.

New Mexico State University's master's accelerated program allows **academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students to complete a

graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to the PHS Graduate Coordinator about your MAP plan and develop a course plan in consultation with that person.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework, of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a B- or lower grade is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the PHS MAP program; other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. Other Cultural Foundation courses (PHLS 5600-5699) may be substituted when offered.

Prefix	Title	Credits
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5610	Health Disparities: Determinants and Interventions	3
PHLS 5620	Cross-Cultural Aspects of Health	3

Public Health (Health Management, Administration & Policy) - Master of Public Health

Thesis Option:

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
Health Management, Administration and Policy Concentration		
PHLS 5310	Principles of Health Program Management	3

PHLS 5330	Public Health Finance and Budget Management	3
PHLS 5340	Public Health Law and Ethics	3
PHLS 5250	Evaluative Approaches in Public Health ¹	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5660		3
Additional Requirements		
PHLS 5998	Field Experience	3
PHLS 5999	Master's Thesis ²	6
Total Credits		42

¹ PHLS 5210 Foundations & Techniques of Public Health Education is a pre-requisite for PHLS 5250 Evaluative Approaches in Public Health for HBHP students, but not required for HMAP students. The student will need a prerequisite hold released for registration.

² HMAP concentration students are encouraged to consider the thesis option only in unique circumstances and in consultation with their advisor and the Graduate Coordinator. Final examination for the thesis option consists of an oral defense of the thesis and related course work.

Non-Thesis Option:

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
Health Management, Administration and Policy Concentration ¹		
PHLS 5310	Principles of Health Program Management	3
PHLS 5330	Public Health Finance and Budget Management	3
PHLS 5340	Public Health Law and Ethics	3
PHLS 5250	Evaluative Approaches in Public Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5660		3
Additional Requirements		
PHLS 5998	Field Experience	3
Electives ¹		6
Integrative Learning Experience ³		
Total Credits		42

¹ Elective courses may include other 5000-level courses from other departments. Some PHLS 5000-level courses are crossed listed with PHLS 4000 level courses (e.g PHLS 4640 Rural Health Issues and PHLS 5640 Rural Health Issues). Students who have previously taken one of these 4000 level courses at NMSU, may not take the corresponding 5000 level MPH course for degree completion credit. Select elective and optional courses may also be available during summer sessions.

² PHLS 5210 Foundations & Techniques of Public Health Education is a pre-requisite for PHLS 5250 Evaluative Approaches in Public Health for HBHP students, but not required for HMAP students. The student will need a prerequisite hold released for registration.

³ Non-Thesis students must complete an Integrative Learning Experience (ILE) that allows them to demonstrate a synthesis of foundational and concentration competencies. This also serves as the final exam for Graduate School Requirements.

All MPH students must comply with the Student Code of Conduct for the Department of Public Health Sciences. This can be found online at the Department's web page. (<http://publichealth.nmsu.edu> (<https://publichealth.nmsu.edu>))

Thesis Option:

Visit with an advisor for help with creating a customized plan.

Non-Thesis Option:

First Year

Fall		Credits
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5140	Health Services System: Administration and Organization	3
Credits		6

Spring

PHLS 5160	Public Health Policy Analysis	3
PHLS 5330	Public Health Finance and Budget Management	3
Credits		6

Summer

Cultural Foundation Course or Elective		3
Credits		3

Second Year

Fall		Credits
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5310	Principles of Health Program Management	3
Credits		6

Spring

PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
Cultural Foundation Course or Elective		3
Credits		6

Summer

PHLS 5998	Field Experience	3
Cultural Foundation Course or Elective		3
Credits		6

Third Year

Fall		Credits
PHLS 5340	Public Health Law and Ethics	3
PHLS 5250	Evaluative Approaches in Public Health ¹	3
Complete Integrative Learning Experience		
Credits		6

Spring

PHLS 5150	Environmental Public Health Issues	3
Credits		3
Total Credits		42

¹ PHLS 5210 Foundations & Techniques of Public Health Education is a pre-requisite for PHLS 5250 Evaluative Approaches in Public Health for HBHP students, but not for HMAP students. The student will need a prerequisite hold released for registration.

New Mexico State University's master's accelerated program allows **academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years.

The master's accelerated programs allow students to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to the PHS Graduate Coordinator about your MAP plan and develop a course plan in consultation with that person.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework, of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a B- or lower grade is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the PHS MAP program; other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. Other Cultural Foundation courses (PHLS 5600-5699) may be substituted when offered.

Prefix	Title	Credits
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5610	Health Disparities: Determinants and Interventions	3
PHLS 5620	Cross-Cultural Aspects of Health	3

Public History and Public Administration - Dual M.A. Degree

The Department of History and the Department of Government offer a dual degree in which students who are accepted into both of these programs may simultaneously earn both a Master of Arts in History degree with the Public History specialization, and a Master of Public Administration degree. The dual degree requires 57 total credits, while students who pursued both degrees as separate degrees would need to pass at least 72 credits. Students earning the dual degrees must pass a joint oral examination after passing required courses and completing internship credits in both programs. Students interested in the dual degree program should consult with the Director of the Public History Program and the Director of the Master of Public Administration Program.

Range Science - Master of Science

A GPA of 3.0 or higher is required for admission. GRE exam is not required. Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined by the admissions committee and the student's graduate committee and advisor.

Graduate Program with the Thesis (Research) Option

A minimum of 30 credits of graduate work is required to graduate. At least one advanced statistics course or equivalent is required, as determined by the student's graduate committee. The thesis research project must be approved by the student's graduate committee. Every effort should be made to publish the thesis as a scientific journal article or Experiment Station publication.

Graduate Program with the Non-Thesis Option

A minimum of 32 credits of graduate work is required to graduate. A final written report is required.

The report will be on a topic approved by the student's graduate committee. Research for the report may involve field work and data gathering, but should also be strongly library- and literature-based.

The report should be of graduate quality and content, and should follow graduate school thesis format or the format of an acceptable scholarly journal. Final approval and acceptance of the report will be by the student's graduate committee. Every effort should be made to publish the report in an appropriate outlet (journal article, Experiment Station bulletin or report, Extension bulletin, etc.)

Social Work - Master of Social Work

The requirements for the Master of Social Work degree include 60 credits of designated graduate courses (30 credits of designated graduate courses for those accepted for advanced standing); a cumulative grade-point average of at least 3.0 on a 4.0 scale in all courses and practicums.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

An integral part of a graduate social work program is completing practicums. For those enrolled in the two-year and three-year programs, two practicum placements totaling 950 hours will be required. For those students entering the program with advanced standing, one practicum placement is required, totaling 500 hours in the field. Students are offered a wide range of practicum sites from which to choose. Students should be prepared to travel some distance and be responsible for their own transportation costs.

Application Deadlines

The early decision deadline for completed applications is December 1 for fall admission. The priority deadline for completed applications is February 1 for fall admission. The final deadline for completed applications is April 1 for fall admission. Late applications (those received after February 1) will be reviewed only on a space-available basis; applicants should plan to submit by the priority deadline to ensure full consideration.

The requirements for the Master of Social Work degree include 60 credits of designated graduate courses (30 credits of designated graduate courses for those accepted for advanced standing); a cumulative grade-point average of at least 3.0 on a 4.0 scale in all courses and practicums.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

An integral part of a graduate social work program is completing practicums. For those enrolled in the two-year and three-year programs, two practicum placements totaling 950 hours will be required. For those students entering the program with advanced standing, one practicum placement is required, totaling 500 hours in the field. Students are offered a wide range of practicum sites from which to choose. Students should be prepared to travel some distance and be responsible for their own transportation costs.

Application Deadlines

The early decision deadline for completed applications is December 1 for fall admission. The priority deadline for completed applications is February 1 for fall admission. Applications received after February 1 will only be reviewed on a space-available basis. Please apply by February 1 for full consideration.

Course of Study

Full-Time Program (60 credits)

First Year		
Fall		Credits
SOWK 5110	Sociocultural Concepts and Populations of the Southwest	3
SOWK 5130	Human Behavior and the Social Environment I	3
SOWK 5160	Generalist Social Work Practice I	3
SOWK 5180	Generalist Practicum Experience I	3
5000-level Elective Course ¹		3
Credits		15
Spring		
SOWK 5150	Social Problems and Social Welfare Policy	3

SOWK 5140	Human Behavior & the Social Environment II	3
SOWK 5170	Generalist Social Work Practice II	3
SOWK 5120	Social Work Research I	3
SOWK 5190	Generalist Practicum Experience II	3
Credits		15
Second Year		
Fall		
SOWK 5250	Policy Analysis and Change	3
SOWK 5320	Advanced Practice with Individuals	3
SOWK 5330	Advanced Practice with Groups	3
SOWK 5310	Advanced Social Work Mental Health Practice	3
SOWK 5280	Advanced Generalist Practicum Experience I	3
Credits		15
Spring		
SOWK 5340	Advanced Practice with Families	3
SOWK 5350	Advanced Practice with Organizations and Communities	3
SOWK 5220	Social Work Research II	3
SOWK 5290	Advanced Generalist Practicum Experience II	3
5000-level Elective Course ¹		3
Credits		15
Total Credits		60

¹ This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog.

Course of Study: Full-Time Advanced Standing (30 credits)

Full-Time Advanced Standing begins in Summer and then follows the Year Two schedule, with the addition of 3 credits MSW or/outside elective in both fall and spring semesters.

First Year		
Fall		Credits
SOWK 5250	Policy Analysis and Change	3
SOWK 5320	Advanced Practice with Individuals	3
SOWK 5330	Advanced Practice with Groups	3
SOWK 5310	Advanced Social Work Mental Health Practice	3
SOWK 5280	Advanced Generalist Practicum Experience I	3
Credits		15
Spring		
SOWK 5340	Advanced Practice with Families	3
SOWK 5350	Advanced Practice with Organizations and Communities	3
SOWK 5220	Social Work Research II	3
SOWK 5290	Advanced Generalist Practicum Experience II	3
5000-level Elective Course ¹		3
Credits		15
Total Credits		30

¹ This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog.

Course of Study: Part-Time Program (60 credits)

First Year		
Fall		Credits
SOWK 5110	Sociocultural Concepts and Populations of the Southwest	3
SOWK 5130	Human Behavior and the Social Environment I	3
5000-level Elective Course ¹		3
Credits		9
Spring		
SOWK 5150	Social Problems and Social Welfare Policy	3
SOWK 5140	Human Behavior & the Social Environment II	3
SOWK 5120	Social Work Research I	3
Credits		9
Second Year		
Fall		
SOWK 5250	Policy Analysis and Change	3
SOWK 5160	Generalist Social Work Practice I	3
SOWK 5180	Generalist Practicum Experience I	3
Credits		9
Spring		
SOWK 5170	Generalist Social Work Practice II	3
SOWK 5190	Generalist Practicum Experience II	3
5000-level Elective Course ¹		3
Credits		9
Third Year		
Fall		
SOWK 5320	Advanced Practice with Individuals	3
SOWK 5330	Advanced Practice with Groups	3
SOWK 5310	Advanced Social Work Mental Health Practice	3
SOWK 5280	Advanced Generalist Practicum Experience I	3
Credits		12
Spring		
SOWK 5340	Advanced Practice with Families	3
SOWK 5350	Advanced Practice with Organizations and Communities	3
SOWK 5220	Social Work Research II	3
SOWK 5290	Advanced Generalist Practicum Experience II	3
Credits		12
Total Credits		60

¹ This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog.

Related Outside Elective Examples (choose one graduate level)

MSW elective courses not listed above, Sociology, Anthropology, Psychology, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, Criminal Justice.

Sociology - Master of Arts

Thesis Program Requirements

In addition to the successful completion of an acceptable master's thesis, students who choose this option will take a minimum of 36 credit hours of graduate work distributed as follows:

Prefix	Title	Credits
Requirements		
SOCI 5110	Perspectives on Sociology ¹	3
SOCI 5163	Issues in Advanced Quantitative Analysis ¹	3
SOCI 5165	Foundations of Social Theory ¹	3
SOCI 5153	Seminar in Sociological Research ¹	3
SOCI 5157	Seminar in Qualitative Research Methods ¹	3
SOCI 5999	Master's Thesis	6
Select an additional 15 credits from 5000 level Sociology course work to be taken in consultation with the sociology graduate student's advisor.		15
Final master's oral examination covering all general coursework and the thesis.		
Total Credits		36

¹ To be taken within the first 27 hours of graduate credit. A grade of B- or better is required to receive credit for each of these core courses.

Non-Thesis Program Requirements: Coursework Only

Students who choose this option will take a minimum of 36 credit hours of graduate work distributed as follows:

Prefix	Title	Credits
Requirements		
SOCI 5110	Perspectives on Sociology ¹	3
SOCI 5163	Issues in Advanced Quantitative Analysis ¹	3
SOCI 5165	Foundations of Social Theory ¹	3
SOCI 5153	Seminar in Sociological Research ¹	3
SOCI 5157	Seminar in Qualitative Research Methods ¹	3
Select an additional 21 credits from 5000 level Sociology course work to be taken in consultation with the sociology graduate student's advisor.		21
Final master's written examination covering all general coursework.		
Total Credits		36

¹ To be taken within the first 27 hours of graduate credit. A grade of B- or better is required to receive credit for each of these core courses.

Admission Requirements

To apply for admission to the Sociology MA Program and the Graduate School, applicants must meet the following criteria and submit the following through <https://apply.nmsu.edu/apply/>

- Application form and fees
- An undergraduate cumulative GPA of at least 3.0 on a 4.0 scale.
- A record of professional, ethical, and collegial behavior.
- Official undergraduate and graduate transcripts from all colleges and universities attended.
- A well written statement of purpose from the candidate addressing graduate school objectives and interests.
- Three letters of recommendation describing personal qualities and achievements that suggest the applicant will be successful in the program. We prefer that letters of recommendation come from faculty members familiar with the academic work and professional conduct of the applicant.

Failure to meet any of the above criteria may result in the student not being accepted into our program. However, in cases when an otherwise outstanding student does not meet the GPA requirements, the student may be accepted provisionally into the program.

The GRE is not required for admission. Students may be required to take prerequisites prior to gaining admission.

For priority consideration, the deadline for application is February 15 for Fall admission.

Master's Accelerated Program (MAP) Guidelines

The Masters Accelerated Program allows academically qualified undergraduate students to complete up to 12 credit hours towards a master's degree during their junior and/or senior years while still completing the bachelor's degree. The courses only apply to classes they would take within the Master of Arts program in Sociology.

NMSU GENERAL ELIGIBILITY

- Must have completed 60 hours of undergraduate coursework (minimum 25 hours at NMSU)
- GPA larger or equal to 3.00
- Complete MAP Referral Form

NMSU MAP REGULATIONS/STIPULATIONS

- Courses will count toward both degrees; they will show on undergraduate and graduate transcripts and count towards both GPAs.
- Graduate level courses included in the master's accelerated program are those courses numbered 5000 and above *or those chosen by the graduate academic departments*.
- Students must receive a grade of B- or higher in all MAP coursework to be counted as graduate credit.
- Students apply for the graduate program in their final semester or second to last semester of their undergraduate degree. Depending upon the deadlines set forth by the Department of Sociology.
- Acceptance of MAP credits does not imply acceptance into the Department of Sociology master's program.

Final admissions and acceptance into the graduate program are based on academic performance at the undergraduate level and completion of the eligible undergraduate degree.

- Tuition is based on the level of the student, not the course
- Students may become ineligible for MAP if their undergraduate or graduate GPA drops below 3.0
- Students accepted into the master's accelerated program must participate in the Developing New Scholars Program (DNSP), offered by the Graduate School.
- Students must be advised each semester for the MAP program by their potential graduate program and cleared for registration in graduate courses by the Graduate School.

How to Apply to the MAP Program:

1. A student may apply, or the department may invite students to participate in MAP.
2. *Departments accept students based on the Master's Accelerated Program requirements as set by the department.*

3. A Sociology graduate faculty member, Graduate Coordinator, or Department Head will forward the Master's Accelerated Program Referral Form to the graduate school.
4. Graduate School will hold the referral form until the student has completed their undergraduate degree.
5. The referral form will be used as part of the graduate school's final admissions into the master's program.
6. The following courses are eligible for the Sociology MAP Program:

MAP Courses

In accordance with the Higher Learning Commission (HLC), CRRT.B.10.020.B1c, an institution may allow well-prepared advanced students to substitute its graduate courses for required or elective courses in an undergraduate degree program *and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program that the institution offers*. A graduate program has the discretion to use up to 12 credits of NMSU Sociology coursework (5000 level or higher) that can be applied towards the completion of the master's program of study. Students must receive a grade of B- or higher in this coursework to be counted for graduate credit.

Accepted MAP Courses

The following courses are accepted for use in the Sociology MAP program; other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
SOCI 5110	Perspectives on Sociology	3
SOCI 5153	Seminar in Sociological Research	3
SOCI 5157	Seminar in Qualitative Research Methods	3
SOCI 5163	Issues in Advanced Quantitative Analysis	3
SOCI 5165	Seminar in Classical Social Theory	3

Spanish - Master of Arts

The degree plan requires a minimum of 36 credits in Spanish, of which at least 30 must be earned at the 500 level, and the remainder above the 450 level. The courses should be concentrated in the student's chosen area of study (linguistics or literature) as each student will be tested on a reading list that corresponds to each area study. A thesis is optional. Students authorized to complete a thesis may count a maximum of 6 credits of thesis work toward the degree. At the present time, the thesis option is not available for online-only students. There are no required core courses at this time and a student should work closely with his/her advisor and the Graduate Director to establish an appropriate individual degree plan.

All students in either the on-campus or online program may complete a minor at the master's level by taking 9 credits (3 courses) at the 500 level or above, in another area (department) of study, or within the department itself. For instance, a student studying linguistics may wish to obtain a minor in literature or a student studying literature may wish to obtain a minor in linguistics. In either case, the minor credits count as part of the 36 total credits required for the degree. In all cases, the student should work closely with the Graduate Director to ensure his/her particular plan of study is acceptable to the program.

Area of Study: Linguistics

Prefix	Title	Credits
Select 12 courses from the following:		36
SPAN 507	Technology Enhanced Language Learning	
SPAN 508	Teaching Literature with Technology	
SPAN 509	Teaching Culture with Technology	
SPAN 510	Assessing the National Standards	
SPAN 540	Introduccion a la Linguistica	
SPAN 545	Advanced Dialectos del Espanol	
SPAN 558	Bilinguismo	
SPAN 561	Advanced Spanish Phonetics	
SPAN 562	Advanced Spanish Phonology	
SPAN 570	Advanced Study in Technical Translation	
SPAN 580	Research Methodology in Spanish Linguistics	
SPAN 584	Spanish Morphosyntax	
SPAN 589	Spanish Sociolinguistics	
SPAN 591	Advanced Study in History of the Spanish Language	
SPAN 592	Advanced Structure of Spanish	
SPAN 594	Theory and Methodology of Spanish Pedagogy	
SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers	
Total Credits		36

Area of Study: Literature

Prefix	Title	Credits
Select 12 courses from the following:		36
SPAN 500	Methods of Research and Literary Criticism	
SPAN 512	Contemporary Spanish-American Poetry	
SPAN 520	Adv. The Art of Storytelling	
SPAN 521	Advanced Culture and Literature of New Mexico	
SPAN 528	Advanced U.S. Latino Culture and Literature	
SPAN 547	Advanced Hispanic Film	
SPAN 548	Advanced U.S.-Hispanic Film	
SPAN 552	Advanced Literature of the Mexican Revolution	
SPAN 563	Advanced Study in Mexican Literature	
SPAN 564	Advanced Post-Modern Hispanic Literature	
SPAN 566	Contemporary Spanish-American Novel	
SPAN 567	Advanced Study in Chicano Literature	
SPAN 573	Advanced Study in Creative Writing	
SPAN 583	Advanced Study in Spanish-American Women Writers	
SPAN 586	Contemporary Spanish-American Essay	
SPAN 587	Contemporary Spanish-American Short Story	
SPAN 588	Contemporary Spanish-American Drama	
Total Credits		36

Courses that may apply to either area include SPAN 590 Advanced Special Topics (see subtitles in schedule of courses to confirm subject of the course) SPAN 598 Independent Reading, Research, and/or Creative Writing, SPAN 599 Master's Thesis (both courses require a course proposal and prior approval).

Additional Language Requirement

For both the on-campus and online degrees, the department requires that students fulfill a second language requirement (in addition to English

and Spanish) by following an approved course of study. Typically, this is completed by taking a four-semester course of study, but may vary according to the languages available.

Options for completing this requirement include taking classes at a local Community College or University, or online. Some students have met this requirement by studying abroad through NMSU. Students should consult the Graduate Director to establish a plan and discuss how this requirement will be met. *Note: evidence of fulfilling the second language requirement must be provided to the Graduate Director BEFORE taking final examinations.*

English Language Requirement

International students are required to demonstrate proficiency in English and meet all international admissions requirements prior to beginning their program of study. Please see the section of the Graduate Catalog on international admissions requirements and scores required for either the TOEFL or IELTS exam. *Note: evidence of fulfilling the English Language Requirement must be provided to the Graduate Director AND the Graduate School BEFORE taking final examinations.*

Final Examinations

Students must successfully complete a final department examination (generally during the final semester of coursework) that is partially written and partially oral. Please consult the Graduate Director for specific information on dates and format for these exams. Final examinations are only available during the Fall and Spring semesters.

Areas of Interest/Reading List

As stated previously, each student needs to select an area of interest: Linguistics or Literature. At the end of the student's degree, the final examinations (written and oral) will be based on the readings from the readings list in the student's selected area of study. For example, a student that has opted to specialize in literature is responsible for reading all the materials on the Literature Reading List. Likewise, a student that has opted to specialize in linguistics is responsible for reading all the materials on the Linguistics Reading List. The student is responsible for the reading list that was in place the year he or she started the program.

Each student is responsible for covering the reading materials listed. Please contact the Graduate Director for a detailed reading. Note that the list is dated, so make sure to refer to the correct list that covers the year/semester the student started the program. The student is responsible for covering ALL the readings even if the student did not cover them as part of work done in class.

Graduate Assistantships

For the on-campus program only, the department awards graduate assistantships to qualified students. For this financial assistance, the student works up to 20 hours a week in departmental programs, chiefly in the teaching of elementary and intermediate Spanish courses in either the Heritage Language sequence or Spanish as a second Language sequence. Students interested in being considered for an assistantship should clearly state this interest in their introduction letter during the application process. The department offers a limited number of assistantships, and students should remember that not everyone that applies for this award receives one. Maintaining the award depends on the student's successful performance both academically and in the classes he/she teaches and is evaluated on a semester-by-semester basis. Students who receive an assistantship are required to take SPAN 594 Theory and Methodology of Spanish Pedagogy (see course

description) as part of their degree plan in order to help them prepare for teaching classes at NMSU.

Special Education - Master of Arts

Enrollment in graduate licensure program courses with field experiences in Special Education is limited to persons who have been accepted into the graduate program in Special Education. For other special education graduate courses, enrollment of students outside of the special education program is contingent upon meeting prerequisites and availability after enrollment of Special Education graduate students. To complete a course of study, each student must meet the program's academic and field based competency criteria, including a grade of B or higher in each course in the program of study, satisfactory evaluation in field experiences for those seeking licensure, and a passing score on the MA Comprehensive Exam. The Master of Arts in Special Education has five pathways to meet the varied needs of students pursuing graduate education and can be completed in two years for full-time students.

MA in Special Education Pathways

Admission The Special Education Program has a "rolling admissions" procedure for MA programs. Applications are reviewed upon submission to determine if candidates meet admission requirements. Application requirements follow: 1. A completed Graduate School admission application. 2. A letter of interest explaining the applicant's goals in pursuing an MA in Special Education. 3. Complete transcripts of all college work, including notation of a BA or BS Degree and a cumulative GPA of a 3.0 or higher. 4. A curriculum vitae or resume. 5. Email addresses to contact three individuals who can provide a professional recommendation, such as professors, employers, or others qualified to evaluate potential for graduate work. 6. For alternative licensure, a letter from a school district indicating consideration for a position. 7. For international students with English language testing requirements, TOEFL test results of at least 79 iBT; 550 paper, or IELTS results of at least 6.5. MA in Special Education Pathways

MA in Special Education (Initial License)

This route is 42 credits including student teaching and provides preparation for the New Mexico pre-K-12 Special Education license. Candidates must be admitted to the Teacher Education Program before completing practicum and student teaching experiences.

There are two course prerequisites that may be required, SPED 5105 Introduction to Special Education in a Diverse Society and SPED 5230 Advanced Curriculum for Diverse Exceptional Learners. If these are required they must be taken in the first semester they are offered.

Prefix	Title	Credits
Course Requirements		
SPED 5210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 5120	High Incidence Disabilities in a Diverse Society	3
SPED 5110	Low Incidence Disabilities in a Diverse Society	3
SPED 5130	Reading for Elementary Exceptional Learners in a Diverse Society, K-6	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED 5140	Reading for Secondary Exceptional Learners in a Diverse Society, 7-12	3
SPED 5850	Current Research in Special Education	3

SPED 5160	Technology and Exceptionality in a Diverse Society	3
SPED 5811	Field Experience in Education, Equity & Cultural Diversity	3
SPED 5220	Classroom Management for Diverse Learners	3
SPED 5810	Student Teaching SPED	6
Total Credits		36

¹ Admittance to TEP is required before registering for SPED 5811 Field Experience in Education, Equity & Cultural Diversity, which must be taken the semester before student teaching.

² Admittance to STEP is required before registering for SPED 5810 Student Teaching SPED, which is the culminating course.

MA in Special Education (Prior General Ed. Licensure)

This route requires 30 credits of special education coursework and provides preparation for a second license, in Special Education, for students who already have an initial license in another area such as Early Childhood, Elementary, or Secondary Education.

There are two course prerequisites that may be required, SPED 5105 Introduction to Special Education in a Diverse Society and SPED 5230 Advanced Curriculum for Diverse Exceptional Learners. If these are required they must be taken in the first semester they are offered.

Prefix	Title	Credits
Course Requirements		
SPED 5210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 5120	High Incidence Disabilities in a Diverse Society	3
SPED 5110	Low Incidence Disabilities in a Diverse Society	3
SPED 5130	Reading for Elementary Exceptional Learners in a Diverse Society, K-6	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED 5140	Reading for Secondary Exceptional Learners in a Diverse Society, 7-12	3
SPED 5850	Current Research in Special Education	3
SPED 5160	Technology and Exceptionality in a Diverse Society	3
SPED 5811	Field Experience in Education, Equity & Cultural Diversity ¹	3
SPED 5220	Classroom Management for Diverse Learners	3
Total Credits		30

¹ SPED 5811 Field Experience in Education, Equity & Cultural Diversity is taken during the final semester of coursework

MA in Special Education (Alternative Licensure)

This route includes 39 credits. It begins with completion of alternative licensure components, which includes 21 credits of state-approved coursework and two semesters of university supervision while concurrently employed as the special education teacher of record in a classroom. After completion of the alternative components, students complete the remaining coursework (18 credits) and degree requirements.

Note: *Alternative Licensure requires concurrent employment as a special education teacher.*

Prefix	Title	Credits
Course Requirements		
<i>Alternative Licensure Courses</i>		
SPED 5105	Introduction to Special Education in a Diverse Society	3
SPED 5210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 5120	High Incidence Disabilities in a Diverse Society	3
SPED 5110	Low Incidence Disabilities in a Diverse Society	3
SPED 5130	Reading for Elementary Exceptional Learners in a Diverse Society, K-6	3
SPED 5140	Reading for Secondary Exceptional Learners in a Diverse Society, 7-12	3
SPED 5220	Classroom Management for Diverse Learners	3
<i>Additional Courses for the MA</i>		
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED 5850	Current Research in Special Education	3
SPED Elective Courses (12 credits)		12
Total Credits		39

MA in Special Education (Scholarly Route)

This route requires 30 credits of special education coursework and is for students who are not seeking licensure or who already have a license and are seeking additional depth of knowledge.

There are two course prerequisites that may be required, SPED 5105 Introduction to Special Education in a Diverse Society and SPED 5230 Advanced Curriculum for Diverse Exceptional Learners. If these are required they must be taken in the first semester they are offered.

Prefix	Title	Credits
Course Required		
SPED 5850	Current Research in Special Education	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED Elective Courses ¹		24
Total Credits		30

¹ Electives are selected in consultation with an advisor, who will make recommendations based on prior coursework and individual student interests.

MA in Special Education (emphasis in Visual Impairment)

This route requires 30-36 credit hours in visual impairment and special education coursework and prepares for licensure in teaching school-aged children/infants/toddlers and/or orientation and mobility. Students who meet qualifications and are interested in visual impairment may elect to pursue licensure only, rather than a master's degree, with 15-27 credits leading to a Blind and Visually Impaired Teaching License or National Certification in Orientation and Mobility.

Water Science and Management - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of

formal course work, plus 6 additional thesis research credits, as detailed below. The degree also has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credit OR Select one from the following: ²		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		16
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		32-33

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Water Science and Management (Agricultural Water Resources) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also have five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credit OR Select one from the following: ²		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		

Students must work with their committee to select 12 credits of elective courses that would meet the Agricultural Water Resources concentration 12

Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		4
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		32-33

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 575	Economics of Water Resource Management and Policy	3

GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
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Water Science and Management (International Water Resilience) - Master of Science

Prefix	Title	Credits
Course Requirements		
WSAM 590	System Dynamics	3
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management (Lab Required - RGSC 318 M1A or M1B)	3
or SOIL 456	Irrigation and Drainage	
A ST 505	Statistical Inference I	4
POLS 537	Issues in Public Policy	3
WSAM 595	Hands-On Transboundary Aquifer and Community System Convergence Seminar	4
WSAM 598	Internship	3
Choose one course from the following:		3
GEOG 481	Fundamentals of Geographic Information Science (GIS)	
ANTH 579	Qualitative Data Analysis and Interpretation	
POLS 502	Research Methods in Government	
POLS 503	Qualitative Research Methods	
SOCI 5157	Seminar in Qualitative Research Methods	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SOCI 5153	Seminar in Sociological Research	
WSAM 599	Masters Thesis	6
Total Credits		32

Water Science and Management (Water Economics and Policy) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credit OR Select one from the following: ²		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	

Concentration courses		
ECON 457	Mathematical Economics	3
AEEC 540	Econometrics I	3
or ECON 545	Econometrics II	
AEEC 501	Microeconomic Theory	3
Students must work with their committee to select 3 credits of elective course(s) that would meet the Water Economics and Policy concentration		3
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		4
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		32-33

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Ideas for Water Economics & Policy Electives

- AEEC 575 Economics of Water Resource Management and Policy
- PHLS 4130 Environmental Health
- ECDV 651 Economic Development Theory
- ECDV 661 Regional Economic Modeling
- ECDV 664 Population Economics
- ECDV 668 Economic Development Finance
- ECDV 671 Sustainable Economic Development
- PHLS 5150 Environmental Public Health Issues
- PHLS 5640 Rural Health Issues
- PHLS 5660 U.S.-Mexico Border Health Issues

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.

- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 575	Economics of Water Resource Management and Policy	3
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4

Water Science and Management (Water Informatics) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also have five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credit OR Select one from the following: ²		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		
Students must work with their committee to select 12 credits of elective course(s) that would meet the Water Informatics concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		4
Thesis		

WSAM 599	Masters Thesis	6
Total Credits		32-33

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 575	Economics of Water Resource Management and Policy	3
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4

Water Science and Management (Water Quality and Treatment) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credit OR Select one from the following: ²		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		
Students must work with their committee to select 12 credits of elective course(s) that would meet the Water Quality and Treatment concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		4
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		32-33

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.

- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 575	Economics of Water Resource Management and Policy	3
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4

Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credit OR Select one from the following: ²		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		
Students must work with their committee to select 3 credits of elective course(s) that would meet the Watersheds and Aquatic/Riparian Wetlands concentration		12

Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		4
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		32-33

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 575	Economics of Water Resource Management and Policy	3
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4

Aerospace Engineering - Doctor of Philosophy

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Aerospace Engineering. The degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Aerospace Engineering. Students must follow the degree requirements listed below to complete the Ph.D. course of study.

- A minimum of 36 credit hours of coursework (500 level or above) beyond the Bachelor of Science degree, at least 18 of which must support the student's research area.
- A minimum of 24 credit hours of research, A E 700 Doctoral Dissertation, which may include a maximum of 6 credit hours of A E 600 Doctoral Research. A E 600 Doctoral Research is intended for those students who have not completed the qualification examination, a prerequisite for A E 700 Doctoral Dissertation.
- A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The Ph.D. dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

Ph.D. Program Transfer Credits

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

Selection of Permanent Ph.D. Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the Ph.D. written qualifying examination, the Ph.D. written and oral comprehensive examination, the student's Ph.D. committee, and the Ph.D. dissertation are contained in the department's Graduate Program website.

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for

the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

filed with the Graduate School after completion of 12 credits and after the qualifying exam, and before registering for additional courses.

Animal Science - Doctor of Philosophy

Requirements for Ph.D. Degree in Animal Science

Admission

1. GPA of 3.0 or greater.
2. Three letters of recommendation.
3. Completion of the form, "Application for Graduate Admission in Animal Science" including a brief letter (personal statement) outlining the student's background, career goals, and research interest.
4. Resume
5. Favorable evaluation for admission will be by consensus of the Animal Science Graduate Committee and will be contingent on availability of an advisor and research funding.
6. A requirement for admission as a doctoral graduate student in the department is completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined initially by the Animal Science Graduate Committee.
7. Non- thesis MS degrees are not acceptable although some of the courses may be transferred if deemed appropriate by the student's Doctoral Committee.

General Requirements

1. Graduate students must maintain at least a 3.0 grade point average.
2. A minimum of 90 credit hours of graduate work is required of which:
 - a. At least 30 credits must be in courses numbered 600 or above.
 - b. At least 18 credits must be in ANSC 700 (Doctoral Dissertation).
3. All graduate assistants must enroll as full-time students taking at least 9 graded graduate credits (courses numbered 450 and above). No audits can be taken as part of the 9 minimum credits. Only 3 of the 9 credits may be taken as an S/U option.
 - a. A graduate assistant may not enroll for more than 15 credits each semester.
 - b. If a student needs to take deficiency courses as part of the 9 credits, then a memo from the advisor or department head should be submitted to the Graduate School. If approved, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at New Mexico State University.
 - c. Enrollment during summer sessions is not required.
4. Students admitted to the Doctoral program (passed qualifying exam) must continue to enroll in three credits of graduate work each semester (exclusive of summer sessions) until the dissertation is approved by the Graduate School.
5. In certain instances, deficiency courses may be required.
6. Two semesters of ANSC 515(Graduate Seminar) are required and students are urged to attend seminar every semester that they are in residence.
7. No more than 6 credits of ANSC 698 may apply toward graduation.
8. The "Program of Study and Committee for Doctoral Students" form listing the graduate committee and courses to be taken, should be

Qualifying Examination

1. The Animal and Range Sciences Department may allow the M.S. Final examination to serve as a Ph.D. qualifying exam for students receiving an M.S. in Animal Science at NMSU. See "Guidelines for Graduate Studies" for further details.
2. Doctoral students must take a qualifying exam before completion of one semester of graduate work. The exam is scheduled by the student's advisor and administered by a provisional committee of at least 3 regular Animal Science faculty members in the student's area of concentration (reproductive physiology or ruminant nutrition). Its purpose is to evaluate the student's strengths and weaknesses, determine deficiency courses, and discuss a possible program of study (coursework).
3. After successful completion of this exam, a Doctoral Committee is appointed.

Doctoral Committee

1. The student's Doctoral Committee is selected by the student and the student's advisor, with approval of the Department Head and the Graduate Dean. The committee will consist of five or more members, as follows:
 - a. The committee chair (advisor) and at least two other members must be from the regular Animal Science faculty in the student's concentration area (reproductive physiology or ruminant nutrition).
 - b. One member must be from the Related Area.
 - c. One member from the Research Tool Area.
 - d. The member from the Related or Research Tool Area may serve as the Representative of the Graduate Dean.
2. Duties of the Doctoral Committee
 - a. Prepare and file a preliminary program of study with the Graduate Dean
 - b. Provide counsel for the student during the program
 - c. Attend the comprehensive oral examination and the final dissertation defense.

NOTE: Changes in committee membership must be approved by the Graduate Dean.

Applied Statistics - Doctor of Philosophy

A distinguishing feature of the Applied Statistics doctoral program will be the close integration of research and teaching. All program faculty conduct applied collaborative research, applying a broad range of statistical methodologies to problems in economics, public health, medicine, biology, chemistry, engineering, agriculture, climatology, and other fields. Each faculty member has examples of research they have been engaged in that can be presented to students in nearly all of the program's courses.

To expand the reach of the program, all required courses in the proposed program will be offered through synchronous delivery in which students meet at a regularly scheduled time and material is presented live over the internet. Classes will be scheduled at times that are accessible to the vast majority of our target audience, including late afternoon and

evening when necessary. The department and college have invested in technologies that facilitate synchronous delivery.

Students entering the program with a bachelor's degree, or a master's degree in a field other than statistics, will need to complete a total of 70 credit hours – 52 credit hours of coursework and 18 credit hours of dissertation research.

As part of the required 52 credit hours of coursework, students must complete 12 credit hours of A ST electives at the 500 level or higher. Students may concentrate on a substantive area in economics, marketing, finance, or information systems by choosing quantitative electives from that area. The student's committee will determine whether these courses are acceptable substitutes for A ST electives.

Students must complete at least 18 credit hours of dissertation research. The dissertation is expected to consist of three chapters that are standalone manuscripts that may be submitted to applied journals. Additional chapters in the dissertation may provide background of the problem, literature review, and simulations to support the main topic of research. Deviation from this format will be allowed at the discretion of the student's advisor.

Students entering the program with a master's degree in statistics or biostatistics will need to complete a minimum of 36 credit hours – 18 credit hours of coursework (including 12 credits at the 600 level or higher) and 18 credit hours of dissertation research. Additional coursework may be necessary to make up for deficiencies in the student's prior master's degree.

Students will be required to pass a written qualifying exam after completing at least 12 credit hours of A ST courses at the 500 level or above, typically at the end of their first year in the doctoral program. Students who enter with a master's degree in statistics or biostatistics may elect to take the qualifying exam earlier. The exam will cover the first year of required theory and methods coursework. The exam will be assigned one of three grades: PhD pass, which enables the student to continue in the second year of the doctoral program; Master's pass, indicating that the student has the requisite knowledge for the master's degree in Applied Statistics but has deficiencies that prevent them from continuing in the doctoral program; and fail. Doctoral students who fail the exam or receive a Master's pass on their first attempt will be allowed one opportunity to re-take the exam. Upon completion of their coursework (typically at the end of their third year), students in the doctoral program will be required to pass a comprehensive exam that has both oral and written components. Students who do not pass the comprehensive exam on their first attempt will be allowed a second opportunity to take the exam after a lapse of at least one semester.

Prefix	Title	Credits
A ST 565	Statistical Analysis I	3
A ST 566	Statistical Analysis II	3
A ST 609	Linear Model Theory	3
A ST 665	Bayesian Theory	3
A ST 503	SAS Basics	3
or A ST 515	Statistical Analysis with R	
A ST 616	Computational Statistics	3
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
A ST 507	Advanced Regression	3
A ST 509	Statistical Models for Complex Data Structures	3

A ST 540	Predictive Analytics	3
A ST 645	Time Series Methods	3
A ST 554	Practicum in Statistics	3
Electives – Additional A ST courses at the 500 level or higher or in other areas as determined by student's committee		12
A ST 700	Doctoral Dissertation (Dissertation)	18
Total Credits		70

A Suggested Plan of Study

First Year

Fall		Credits
A ST 565	Statistical Analysis I	3
A ST 503	SAS Basics	3
or A ST 515	or Statistical Analysis with R	
A ST 505	Statistical Inference I	4
Credits		10

Spring		
A ST 566	Statistical Analysis II	3
A ST 507	Advanced Regression	3
Elective		3
Credits		9

Second Year

Fall		
A ST 509	Statistical Models for Complex Data Structures	3
A ST 506	Statistical Inference II	3
Elective		3
Credits		9

Spring		
A ST 616	Computational Statistics	3
A ST 540	Predictive Analytics	3
A ST 554	Practicum in Statistics	3
Credits		9

Third Year

Fall		
A ST 665	Bayesian Theory	3
A ST 609	Linear Model Theory	3
Elective		3
Credits		9

Spring		
A ST 645	Time Series Methods	3
Elective		3
Dissertation research		3
Credits		9

Fourth Year

Fall		
A ST 700	Doctoral Dissertation (Dissertation)	9
Credits		9
Spring		
Dissertation research		6
Credits		6
Total Credits		70

Astronomy - Doctor of Philosophy

The Astronomy Department at NMSU offers programs leading to the Master of Science and the Doctor of Philosophy degrees. Graduate courses (http://astronomy.nmsu.edu/?page_id=2503) cover topics

across all of astrophysics, including stellar atmospheres, observational techniques, the interstellar medium, galactic structure, extragalactic objects, cosmology, the Sun, and planets. Students may also take courses in other relevant fields to broaden their knowledge and capabilities. NOTE: This table is only a minimum. As students must register for minimum 9 credits per semester to remain full time, a student will usually obtain more than the minimum 6 credits of ASTR600 and 18 credits of ASTR700 in order to complete their thesis.

Requirements

In order to complete the comprehensive exam by preparing a PhD proposal.

The student will normally submit their proposed thesis title, and then complete their written and oral thesis proposal, as the final part of their comprehensive exam in Year 3. The following table can be used to run a Degree Audit at this stage. Student must have already completed the written coursework comprehensive and oral coursework comprehensive components. After the completion of their comprehensive through passing the PhD proposal, the student will normally apply for and obtain a masters and continue with their progress on the PhD track.

Prefix	Title	Credits
Requirements		
ASTR 500	Seminar (Take the 1 credit course four times)	4
Choose nine courses from among the following ASTR graduate courses ²		27
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional six credits from the ASTR courses above OR from the courses below ³		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
C S 579	Special Topics	
<i>Special Research Programs</i> ⁴		
ASTR 598	Special Research Programs	3
<i>Pre-dissertation Research</i> ⁵		
ASTR 600	Pre-dissertation Research	6

Total Credits	46
¹	
ASTR 500 Seminar is 1-credit course. It should be taken each of the first 4 semesters, for 4 total credits over the program	
²	

Any 27 credits (9 courses) selected from these. Each course may only be taken for 3 credits.
³

In addition to 9 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 11 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.

A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.

If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee.

Traditionally, these have been in the area of PHYS, E E and C S, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

⁴

ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

⁵

Generally, ASTR 600 Pre-dissertation Research credits are prior to completion of the thesis proposal. A student may take anywhere from 1-9 credits of these in a semester. Students typically take 9 credits of this course each semester until they have completed their thesis proposal. However, only a minimum of 6 are actually required over the program. ASTR600 credits may be in progress.

In order to complete a PhD thesis defense

The MINIMUM course and credit-hour requirements of the NMSU Department of Astronomy toward completion of the Ph.D. program are

Prefix	Title	Credits
Requirements		
ASTR 500	Seminar (Take the 1 credit course four times)	4
Choose nine courses from among the following ASTR graduate courses ²		27
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	

ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional six credits from the ASTR courses above OR from the courses below ³		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
C S 579	Special Topics	
<i>Special Research Programs</i> ⁴		
ASTR 598	Special Research Programs	3
<i>Pre-dissertation Research</i> ⁵		
ASTR 600	Pre-dissertation Research	6
<i>Doctoral Dissertation</i> ⁶		
ASTR 700	Doctoral Dissertation	18
Total Credits		64

¹ ASTR 500 Seminar is 1-credit course. It should be taken each of the first 4 semesters, for 4 total credits over the program

² Any 27 credits (9 courses) selected from these. Each course may only be taken for 3 credits.

³ In addition to 9 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 11 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.

A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.

If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee.

Traditionally, these have been in the area of PHYS, E E and C S, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

⁴ ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

⁵ Generally, ASTR 600 Pre-dissertation Research credits are prior to completion of the thesis proposal. A student may take anywhere from 1-9 credits of these in a semester. Students typically take 9 credits of this course each semester until they have completed their thesis proposal. However, only a minimum of 6 are actually required over the program.

⁶ Generally, ASTR 700 Doctoral Dissertation credits are taken after the thesis proposal is done. A student may take anywhere from 1-9 credits of these in a semester. Typically a student will do 9 credits of this per semester while completing their thesis research, in order to remain full time. However a student may register for fewer in their final semester of completing their thesis, after confirming with their advisor as to how that affects their eligibility at the graduate school. A minimum of 18 credits are required over the program

Year A

A Suggested Plan of Study For Students

A typical roadmap for the PhD program, including course and credit-hour minimum requirements, towards completion of the Ph.D. program are summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs, ASTR 600 Pre-dissertation Research and ASTR 700 Doctoral Dissertation are offered every semester, as one-on-one research credits with an advisor

First Year		
Fall		Credits
ASTR 500	Seminar ¹	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two from the following:		6
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
Credits		10
Spring		
ASTR 500	Seminar ¹	1
Choose three from the following:		9
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
Credits		10
Second Year		
Fall		
ASTR 500	Seminar ¹	1
Choose three of the following ²		9
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
Research Programs Course ²		0-3
ASTR 598	Special Research Programs ²	
Credits		10-13

Spring

ASTR 500	Seminar ¹	1
Choose three of the following: ²		9
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
Research Programs Course ²		0-3
ASTR 598	Special Research Programs ²	
Credits		10-13

Third Year**Fall**

ASTR 600	Pre-dissertation Research ³	6-9
ASTR 698	Special Topics. ⁵	1
Credits		7-10

Spring

ASTR 600 or ASTR 700	Pre-dissertation Research ⁴ or Doctoral Dissertation	6-9
Credits		6-9

Fourth Year**Fall**

ASTR 700	Doctoral Dissertation ⁴	3-9
Credits		3-9

Spring

ASTR 700	Doctoral Dissertation ⁴	3-9
Credits		3-9

Fifth Year**Fall**

ASTR 700 ⁴		3-9
Credits		3-9

Spring

ASTR 700 ⁴		3-9
Credits		3-9

Sixth Year**Fall**

ASTR 700 as required to complete the PhD ⁶		-
Credits		0

Spring

ASTR 700 as required to complete the PhD ⁶		-
Credits		0

Total Credits **65-101**

¹ Students **must** take ASTR 500 Seminar as 1-credit in each of their first 4 semesters, for a total of 4 credits over 2 years

² Students **must** take ASTR 598 Special Research Programs for 3 credits during fall of Yr2 or Spring of Yr2

³ Students **must** continue taking ASTR 600 Pre-dissertation Research until they have completed their Comprehensive Exam. Once a student had completed their Comprehensive Exam, they should start taking ASTR 700 Doctoral Dissertation the following semester. The **minimum total number** of ASTR 600 Pre-dissertation Research credits for Course Requirements is 6, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. Usually students will take 8 ASTR 600 Pre-dissertation Research and 1 ASTR 698 Special Topics. in Fall of Yr 3.

⁴ Assumes a student has completed their Comprehensive Exam - see footnote 3. The minimum number of ASTR 700 Doctoral Dissertation credits for Course Requirements is 18, but students must enroll in 9

credits each semester in order to remain full time and retain eligibility for an GA.

⁵ ASTR 698 Special Topics. in Yr 3 Fall is a 1-credit Thesis Preparation class for all students who are also taking ASTR 600 Pre-dissertation Research that semester

⁶ For students who do not complete their PhD in 5 years, they must continue to enroll in 9 credits of ASTR 700 Doctoral Dissertation each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses.

Year B

A Suggested Plan of Study For Students

A typical roadmap for the PhD program, including course and credit-hour minimum requirements, towards completion of the Ph.D. program are summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR503 is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598, 600 and 700 are offered every semester, as one-on-one research credits with an advisor

First Year**Fall**

		Credits
ASTR 500	Seminar ¹	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two from the following:		6
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
Credits		10

Spring

ASTR 500	Seminar ¹	1
Choose three from the following:		9
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
ASTR 598	Special Research Programs	
Credits		10

Second Year**Fall**

ASTR 500	Seminar ¹	1
ASTR 555	Galaxies I	-
Choose three from the following:		9
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 598	Special Research Programs ¹	3
Credits		13

Spring

ASTR 500	Seminar ¹	1
Choose two from the following: ²		6
ASTR 621	Planetary System Formation	

ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 598	Special Research Programs	1-6
Credits		8-13
Third Year		
Fall		
ASTR 600	Pre-dissertation Research ³	6-9
ASTR 698	Special Topics.	1
Credits		7-10
Spring		
ASTR 700 or ASTR 600	Doctoral Dissertation ⁴ or Pre-dissertation Research	6-9
Credits		6-9
Fourth Year		
Fall		
ASTR 700	Doctoral Dissertation ⁴	3-9
Credits		3-9
Spring		
ASTR 700	Doctoral Dissertation ⁴	3-9
Credits		3-9
Fifth Year		
Fall		
ASTR 700	Doctoral Dissertation ⁴	3-9
Credits		3-9
Spring		
ASTR 700	Doctoral Dissertation ⁴	3-9
Credits		3-9
Sixth Year		
Fall		
ASTR 700 as required to complete the PhD ⁶		-
Credits		0
Spring		
ASTR 700 as required to complete the PhD ⁶		-
Credits		0
Total Credits		66-101

¹ Students **must** take ASTR 500 Seminar as 1-credit in each of their first 4 semesters, for a total of 4 credits over 2 years

² Students **must** take ASTR 598 Special Research Programs for 3 credits during fall of Yr2 or Spring of Yr2

³ Students **must** continue taking ASTR 600 Pre-dissertation Research until they have completed their Comprehensive Exam. Once a student had completed their Comprehensive Exam, they should start taking ASTR 700 Doctoral Dissertation the following semester. The **minimum total number** of ASTR 600 Pre-dissertation Research credits for Course Requirements is 6, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. Usually students will take 8 ASTR 600 Pre-dissertation Research and 1 ASTR 698 Special Topics. in Fall of Yr 3.

⁴ Assumes a student has completed their Comprehensive Exam - see footnote 3. The minimum number of ASTR 700 Doctoral Dissertation credits for Course Requirements is 18, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA.

⁵ ASTR 698 Special Topics. in Yr 3 Fall is a 1-credit Thesis Preparation class for all students who are also taking ASTR 600 Pre-dissertation Research that semester

⁶ For students who do not complete their PhD in 5 years, they must continue to enroll in 9 credits of ASTR 700 Doctoral Dissertation each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses.

Biology - Doctor of Philosophy

The Department of Biology offers graduate study leading to the Doctor of Philosophy degree. Our goal is to prepare students for careers in the various fields in biology through formal coursework and research experiences as well as through seminars and discussion groups.

There are two formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are:

Prefix	Title	Credits
Course Requirements		
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3

Doctor of Philosophy students can choose among the Department's three areas of emphasis:

1. Behavioral, Ecological and Evolutionary Biology

The Behavioral, Ecological and Evolutionary Biology program is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the behavior, ecology, and evolution of living and extinct taxa.

2. Cell and Organismal Biology

The Cell and Organismal Biology program is appropriate for all Graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms. This emphasis focuses in faculty areas of expertise in cell and molecular biology, neurobiology, developmental biology, and physiology.

3. Microbiology

The Microbiology curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and protists) such as their physiology, ecology, development or evolution.

All graduate students should develop their curriculum plan in consultation with their faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website <http://bio.nmsu.edu/grads/>.

Graduate students may also earn a minor in other graduate departments and programs.

Business Administration (Management) - Doctor of Philosophy

Phone: (575) 646-1201

<http://business.nmsu.edu/academics/graduate-programs/mgt-phd/>
(<https://business.nmsu.edu/academics/graduate-programs/mgt-phd/>)

The College of Business offers a program leading to a PhD in Business Administration with a concentration in Management. Our program meets the requirements of AACSB international by providing students with advanced management-related theoretical, research and applied knowledge and skills. We are committed to educating researchers, teachers, and scholars who will lead and shape business and organizational life in the decades to come. We prepare you to understand the complexities of business and its social and international contexts while you develop a specialized area of expertise. Our program is flexible in order to align programs of study with job opportunities and students' interest areas. Research skills are developed through course work and mentoring relationships, as you will work with faculty to pursue joint research according to your interest and faculty members' expertise. Our faculty prepare students for academic research and teaching careers in managerial and organizational sciences; consulting careers with industrial, governmental, health, or educational institutions; or leadership careers in organizational management and administration.

Business Administration (Marketing) - Doctor of Philosophy

Phone: (575) 646-3341

<https://business.nmsu.edu/degree-programs/graduate-programs/doctoral-programs/dp-marketing/phd-marketing.html>

The College offers a program leading to a Ph.D. degree. The faculty of the PhD Program in Business Administration is committed to training researchers and educators who will shape business scholarship, practice and pedagogy. The program emphasizes preparing candidates to understand the complexities of modern business while they develop a specialized area of expertise in marketing or management. The PhD in Business Administration provides graduates with the opportunity to pursue a variety of career paths within academia and within industry. Currently concentrations are offered in management and marketing, and each admits students independently.

Program Requirements

- demonstrate competency in statistics and research methods;
- complete studies in a major field of concentration chosen from the departments of management or marketing in the College of Business;
- complete studies in a minor field of concentration or interest area that supports the student's research, teaching and/or career goals;
- pass qualifying exams consisting of a First-Year Paper and a Second-Year Paper, and pass the comprehensive exam; and
- complete and successfully defend a doctoral dissertation.

Required Courses

Prefix	Title	Credits
Marketing Courses		
MKTG 601	Marketing Management	3
MKTG 620	Contemporary Marketing Readings	3

MKTG 625	Consumer Behavior	3
MKTG 640	Measurement and Structural Equation Modeling	3
MKTG 670	Marketing Theory	3
Management Courses		
Six (6) credits from the following:		6
MGMT 650	Seminar in Organizational Behavior	
MGMT 660	Research Design and Methodology	
MGMT 661	Qualitative Research Methods	
MGMT 670	Seminar in Operations Management	
MGMT 675	Seminar in Strategic Management (Seminar in Strategic Management)	
Research Methods Courses		
Choose one from the following:		3-4
A ST 505	Statistical Inference I (Recommended.)	
PSYC 507	Quantitative Methods in Psychology I (Requires Marketing Department approval.)	
A ST 506	Statistical Inference II (May be replaced by PSYC 508 with Marketing Department approval.)	3
A ST 507	Advanced Regression (May be replaced by PSYC 509 with Marketing Department approval.)	3
A ST 555	Applied Multivariate Analysis	3
PSYC 529	Methods in Social Psychology (May be replaced by a 500+ level course in research methods with Marketing Department approval.)	3
Dissertation Work		
MKTG 700	Doctoral Dissertation	18
Total Credits		54-55

Chemistry - Doctor of Philosophy

The Ph.D. in chemistry is offered in the major emphasis areas of analytical, inorganic, organic, and physical chemistry and biochemistry. The graduate program is designed to teach students modern approaches to chemistry and biochemistry (courses), experimental methods to problem-solving (research), and communication skills in the discipline (seminars and colloquia). Ph.D. candidates are required to complete the courses below, pass a qualifying exam after the first year, pass both a written and oral comprehensive exam before the fourth year, and prepare a written thesis and pass a final oral examination.

Prefix	Title	Credits
CHEM 475	Central Concepts in Chemistry - Safety	1
CHEM 476	Central Concepts in Chemistry - Research Ethics	1
CHEM 477	Central Concepts in Chemistry - Professional Development	1
CHEM 501	Central Concepts in Chemistry - Energy	3
CHEM 502	Central Concepts in Chemistry - Structure	3
CHEM 503	Central Concepts in Chemistry - Dynamics	3
CHEM 504	Central Concepts in Chemistry - Measurements	3
Graduate student seminars		6-12
CHEM 510	Graduate Student Seminar ¹	
CHEM 520	Comprehensive Literature Review Seminar for Graduate Students ²	
Additional Required Courses ³		6-12

Research Credits⁴

24-54

Total Credits

51-93

- ¹ Beginning in the second semester, all Ph.D. students must enroll in 1 credit of CHEM 510 Graduate Student Seminar, attending each semester. At least two credits of CHEM 510 must be taken for a letter grade of B- or better. The remaining CHEM 510 credits may be taken as S/U.
- ² CHEM 520 Comprehensive Literature Review Seminar for Graduate Students is given on a topic of the student's choice as part of the Comprehensive Exam and will be assigned a letter grade. A grade of C+ or lower will require the student to repeat the course a maximum of once.
- ³ Additional courses in subsequent years are chosen based on major emphasis area, through consultation with the thesis committee.
- ⁴ At least 18 credits must be either CHEM 700 Doctoral Dissertation or BCHE 700 Doctoral Dissertation. 700-level research credits are taken after the completion of the comprehensive exam. Remaining credits can be CHEM 600 Research or BCHE 600 Research.

Computer Science - Doctor of Philosophy

Doctoral students may specialize in any of the areas in which computer science faculty members have active research interests. Through interdisciplinary arrangements with other doctoral departments at New Mexico State University, doctoral students may also specialize in such areas as computational biology, computer networks and architectures and cognitive science.

Doctoral students are expected to join the program with a preparation equivalent to that required for the Master's degree in computer science at New Mexico State University. The requirements for the degree are as specified in the NMSU graduate catalog, with the following additional considerations:

- Take and pass the Ph.D. Qualifying Exam. It is expected that students will take the qualifying exam within one year of entering the Ph.D. program or one year after finishing their deficiencies. In the qualifying exam, a student is expected to present a written and oral synthesis of a topical literature review. For more details on the qualifying exam, see the departmental document.
- Students who are enrolled in the Computer Science MS program and complete a Master's thesis can use a successful thesis defense as the qualification exam if the Master's thesis advisor is willing to take the student as a PhD student.
- The comprehensive examination evaluates depth of knowledge in the specific research area selected by the candidate with the consent of their graduate committee. It includes: a written part, in the form of an extensive survey paper; an annotated bibliography; and an oral examination.
- The student is required to submit and defend a prospectus, at the same time or after completing the comprehensive examination. The prospectus describes and motivates the specific research problem to be addressed in the doctoral dissertation.
- A PhD student is required to take at least one course each in the following three areas (theories, systems, and applications)

Graduation Requirements

Prefix	Title	Credits
Theories		
Select at least one from the following:		3
C S 510	Automata, Languages, Computability	
C S 570	Analysis of Algorithms	
C S 583	Advanced Cryptography	
C S 586	Algorithms in Systems Biology	
Systems		
Select at least one from the following:		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 584	Computer Networks II	
C S 582	Database Management Systems II	
Applications		
Select at least one from the following:		3
C S 506	Computer Graphics I	
C S 508	Introduction to Data Mining	
C S 509	Bioinformatics Programming	
C S 513	Computer Security	
C S 514	Introduction to Smart Grids	
C S 515	Human-Centered Computing	
C S 516	Bioinformatics	
C S 517	Digital Game Design	
C S 518	Visual Programming	
C S 519	Applied Machine Learning I	
C S 521	Parallel Programming	
C S 522	Cloud and Edge Computing	
C S 525	Introduction to Cryptography	
C S 531	Principles of Virtual Reality	
C S 532	Modern Web Technologies	
C S 533	Introduction to Deep Learning	
C S 534	Graph Data Mining	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
Other		
Other graduate credit to meet NMSU requirements		21
C S 700	Doctoral Dissertation	18
Total Credits		48

Only courses from the MS CS program from NMSU can be used to waive this requirement.

Students should contact the department for information on additional graduation requirements, or visit the on-line Graduate Handbook (<http://www.cs.nmsu.edu/> (<https://www.cs.nmsu.edu/>)).

Counseling Psychology - Doctor of Philosophy

The CEP Department offers a doctoral program that leads to a Ph.D. in Counseling Psychology. The program is accredited by the American Psychological Association. For more information on this accreditation contact

The Office of Program Consultation and Accreditation
American Psychological Association
750 1st Street, NE

Washington, DC 20002
Phone: (202) 336-5979.

The program is based on the scientist-practitioner model through which both research and service delivery skills are acquired. Graduates of the program are prepared to conduct research, provide service, teach, and supervise. The program prepares students for licensure as psychologists (<http://psybook.asppb.org/>). The two aims of the program are:

1. To prepare entry-level counseling psychologists who are self-reflective and competent in both the practice and science of the profession.
2. To prepare counseling psychologists who think critically about the socio-cultural context of their work and promote social justice

Annual application deadline: December 15

For more information on program application requirements and process, see Counseling Psychology, Ph.D., program website (<https://cep.nmsu.edu/academic-programs/counseling-psych-phd/counseling-psychology-phd.html>).

Program Requirements

CEP faculty conduct periodic reviews of students' progress in the programs, including their academic performance, counseling and psycho-educational skills, professionalism and ethics. Deficits identified through faculty reviews may result in recommendations that students engage in remedial work or that they pursue alternative career goals.

Program of Study

Prefix	Title	Credits
CEPY 5150	The Art & Science of Mindfulness for Helping Professionals (CEP elective)	1-3
CEPY 6160	History and Systems of Psychology	3
CEPY 5180	Addictions Counseling	3
CEPY 6180	Physiology of Behavior	3
CEPY 5280	Primary Care Psychology	3
CEPY 6120	Human Development	3
or CEPY 5120	Human Development	
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6130	Psychology of Multiculturalism	3
CEPY 6150	Social Psychology	3
CEPY 6190	Ethical/Professional Issues in Counseling Psychology	3
CEPY 6425	Counseling Psychology Research	3
CEPY 6430	Advanced Statistics	3
CEPY 6440	Multivariate Statistics	3
CEPY 6420	Psychometrics	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6350	Appraisal of Personality	3
CEPY 6270	Diagnosis and Treatment Planning	3
or CEPY 5270	Diagnosis and Treatment Planning	
CEPY 6320	Career/Life Planning and Vocational Assessment	3
or CEPY 5320	Career/Life Planning and Vocational Assessment	
CEPY 6240	Child and Adolescent Counseling Theory and Technique (CEP elective)	3
or CEPY 5240	Child and Adolescent Counseling Theory and Technique	
CEPY 6250	Family Therapy Theory and Technique (CEP elective)	3

or CEPY 5250	Family Therapy Theory and Technique	
CEPY 6590	Behavioral Health Practicum	3
CEPY 6550	Counseling Psychology Theory/Practicum	3
CEPY 6560	Group Work Theory/Practicum	3
CEPY 6570	Advanced Counseling Psychology Practicum	6
CEPY 6580	Supervision Theory and Practicum	3
CEPY 6620	Internship in Counseling Psychology I	18
CEPY 6630	Internship in Counseling Psychology II	2
CEPY 6450	Educational Experimentation	3
CEPY 7000	Doctoral Dissertation	18
Total Credits		117-119

Curriculum and Instruction - Doctor of Philosophy

The Doctorate of Philosophy (PhD) are rigorous degrees requiring an intellectual and personal commitment. The academic course of study for both degrees is the same. The PhD doctoral program requires students to demonstrate competency in the computer tools or second language sequence. (See below in program descriptions). For the PhD program 66 credit hours is only the minimum and students may be asked to complete additional hours as per their advisor and committee recommendations.

The degree require a dissertation based on original research, inextricably grounded with an array of primary and secondary sources. The degree has required courses of study, but are additionally individualized based on those scholarly and academic expectations set by the doctoral student in collaboration with their Dissertation Committee.

Options and Concentration

Currently there are four Options and one concentration for the Doctoral Program of the Department of Curriculum & Instruction. These are:

Options:

1. Bilingual/TESOL
2. Critical Pedagogies
3. Early Childhood Education
4. Language, Literacy & Culture

Concentration:

1. Educational Learning Technologies

To Apply

- Apply to the NMSU Graduate School (<http://gradadmissions.nmsu.edu/>) (Select Intended major "Curriculum and Instruction" and then concentration you will pursue);
- Apply to C&I by submitting your Application Portfolio by December 15th (via the Graduate School Application portal)
 - See the sections, "Applying to the Doctoral Program," "Doctoral Intake Application Instructions" and the "C&I Doctoral Student Checklist" in the Doctoral Handbook (<https://tpal.nmsu.edu/academics/graduate-programs/graduate-program-handbooks/>).
 - NMSU Doc Portfolio Example – C&I (<https://tpal.nmsu.edu/files/2018/05/ma-handbook-portfolio-2013-1.pdf>) (If the Sample portfolio does not open automatically, try a different browser or try saving the portfolio to your desktop before opening it.)

NOTE: Potential students who have written successful portfolios will be invited to interview with the Doctoral Qualifying Committee (a committee of C&I faculty)

Once Applicants Are Accepted

- Attend the applicable Doctoral Orientation Meeting your first semester of classes
- Meet with your Interim Advisor during your first semester of classes
- Get to know our faculty (<https://tpal.nmsu.edu/faculty/>)
- Read the Doctoral Handbook (<https://tpal.nmsu.edu/academics/graduate-programs/graduate-program-handbooks/>) and the sections of the NMSU Graduate Catalog that apply to you (this is your responsibility)
- Follow the Doctoral Program Checklist from the C&I Doctoral Handbook (<https://tpal.nmsu.edu/academics/graduate-programs/graduate-program-handbooks/>)

Economic Development - Doctor of Economic Development

The Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals.

The Doctor of Economic Development (DED) is designed to prepare students to be professionals in the area of economic development. To receive a DED, students must successfully complete 42 ECDV credits. Successfully passing 2 comprehensive exams (offered twice each summer) is required to register for ECDV courses. The five courses covered by the two exams represent 15 credit hours of course work, which the student may complete at another program or at NMSU.

DED minimum admission requirements:

All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy, and in addition the following:

- Bachelor's degree or equivalent
- Minimum undergraduate GPA: 3.0/4.0
- GRE or GMAT score is recommended (not required)
- Completion of one undergraduate courses in intermediate microeconomic (ECON 311 Intermediate Macroeconomic Theory or equivalent) and intermediate macroeconomic (ECON 312 Intermediate Microeconomic Theory or equivalent) both with grades of B or better
- Completion of one course in college-level calculus (MATH 1430G Applications of Calculus I or equivalent) and one course in statistics including regression analysis (ECON 405 Introductory Econometrics or equivalent), with grades of B or better in both courses
- Additional coursework in matrix algebra is recommended
- One course in mathematical economics ECON 457 Mathematical Economics or equivalent), with a grade of B or better
- International students must meet graduate school admission requirements for English proficiency

In addition, all applicants must successfully pass Comprehensive Exams covering the "Microeconomic Core" and the "Macroeconomic and Econometric Core" before taking upper level ECDV courses. The Microeconomic Core exam covers advanced microeconomic theory

(AEEC 501 Microeconomic Theory and AEEC 596 Individual Study). The Macroeconomic and Econometric Core covers advanced macroeconomic theory (AEEC 502 Macroeconomic Theory), and econometrics (AEEC 540 Econometrics I and ECON 545 Econometrics II).

Students who have not passed all of these "core" courses with a grade of B or better, or feel the need to study the material further, may take the courses, along with ECON 457 Mathematical Economics during the fall and spring semesters of their first year in the program.

- Comprehensive Exam I covers the "Microeconomics Core": AEEC 501, AEEC 596
- Comprehensive Exam II covers the "Macroeconomics and Econometrics Core": AEEC 502 Macroeconomic Theory, AEEC 540 Econometrics I and ECON 545 Econometrics II)
- Students who fail a comprehensive exam may apply to take the exam a second time. Only under special circumstances are students allowed to take a comprehensive exam a third time

Prefix	Title	Credits
All students in the DED program must successfully complete the following:		
ECDV 550	Introduction to Local and Regional Development	3
ECDV 651	Economic Development Theory	3
ECDV 661	Regional Economic Modeling	3
ECDV 664	Population Economics	3
ECDV 668	Economic Development Finance	3
ECDV 671	Sustainable Economic Development	3
ECDV 681	Urban Economic Development	3
ECDV 682	Rural Development	3
ECDV 683	Seminar in National Economic Development	3
ECDV 692	Seminar in Economic Development	3
ECDV 694	Internship	3
ECDV 699	Doctoral Project	9
Total Credits		42

Teaching and research assistantships are available to qualified applicants, however, admission to the program does not imply or guarantee funding.

Detailed and updated information is available at <https://business.nmsu.edu/academic-programs/doctoral-programs/ded/doctor-of-economic-development.html>.

Suggested Plan of Study

This plan of study includes the "core" courses a student has not already completed these with a B or better.

First Year		
Fall		Credits
ECON 457	Mathematical Economics	3
AEEC 501	Microeconomic Theory	3
AEEC 540	Econometrics I	3
Credits		9
Spring		
AEEC 502	Macroeconomic Theory	3
ECON 545	Econometrics II	3
ECDV 590	Special Topics	1-3
Credits		7-9

Second Year**Fall**

ECDV 550	Introduction to Local and Regional Development	3
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ECDV 664	Population Economics	3
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ECDV 671	Sustainable Economic Development	3
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Credits		9
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Spring

ECDV 661	Regional Economic Modeling	3
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ECDV 668	Economic Development Finance	3
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ECDV 694	Internship	3
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Credits		9
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Summer

ECDV 692	Seminar in Economic Development	3
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Credits		3
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Third Year**Fall**

ECDV 681	Urban Economic Development	3
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ECDV 682	Rural Development	3
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ECDV 683	Seminar in National Economic Development	3
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Credits		9
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Spring

ECDV 699	Doctoral Project	9
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Credits		9
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Total Credits		55-57
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ELAD 6635	Higher Education Finance and Funding	3
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ELAD 6910	Dissertation Seminar	3
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ELAD 6998	Advanced Internship	6
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ELAD 7000	Doctoral Dissertation	18
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Total Credits		63
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A Suggested Plan of Study

First Year**Fall**

ELAD 6110	Organizational Theory	3
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ELAD 6120	Elements of Research	3
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Credits		6
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Spring

ELAD 6210	Quantitative Research I	3
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ELAD 6220	Qualitative Research I	3
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Credits		6
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Summer

ELAD 6310	Concepts of Leadership in Education	3
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ELAD 6320	Foundations of Educational Administration	3
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Credits		6
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Second Year**Fall**

ELAD 6410	Quantitative Research II	3
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ELAD 6998	Advanced Internship	3
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Credits		6
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Spring

ELAD 6510	Qualitative Research II	3
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ELAD 6998	Advanced Internship	3
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ELAD 6525	Higher Education Law	3
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Credits		9
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Summer

ELAD 6610	Scholarly Writing and the Southwest Border	3
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ELAD 6620	Evaluation Design in Education	3
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ELAD 6635	Higher Education Finance and Funding	3
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Credits		9
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Third Year**Fall**

ELAD 6910	Dissertation Seminar	3
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Credits		3
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Spring

ELAD 7000	Doctoral Dissertation	6
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Credits		6
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Fourth Year**Fall**

ELAD 7000	Doctoral Dissertation	6
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Credits		6
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Spring

ELAD 7000	Doctoral Dissertation	6
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Credits		6
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Total Credits		63
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Educational Leadership & Administration (Higher Education Administration) - Doctor of Education Educational Leadership Doctoral Program (ELDP)

The Doctor of Education is geared toward those students wishing to pursue a degree which will help them in their profession. Coursework, internships, and research are constructed to develop individuals for administrative position in Pk-12 schools in post secondary institutions.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail message to edmandev@nmsu.edu (edmandev@nmsu.edu) or call (575) 646-3825.

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6410	Quantitative Research II	3
ELAD 6510	Qualitative Research II	3
ELAD 6525	Higher Education Law	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3

Educational Leadership & Administration (Higher Education) - Doctor of Philosophy

Educational Leadership Doctoral Program (ELDP)

The Doctor of Philosophy is a research-oriented degree. Coursework and internships are directed toward developing research proficiencies in educational leadership. The Ph.D. also requires additional hours of coursework in an approved cognate area.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail message to edmandev@nmsu.edu (edmandev@nmsu.edu) or call (575) 646-3825.

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6410	Quantitative Research II	3
ELAD 6510	Qualitative Research II	3
ELAD 6525	Higher Education Law	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6635	Higher Education Finance and Funding	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
ELAD 7000	Doctoral Dissertation	18
Cognate Coursework ¹		15
Total Credits		78

¹ Example of possible Cognate courses but not limited to the following:

- Child and Family Development
- Communication
- Feminist/Gender Studies
- Latino/a Studies
- Native American Studies
- Program Evaluation/Data Analysis
- Research Methods
- Social Justice/Critical Theory
- Sociocultural Theory
- Critical Race Theory/LatCrit
- Sociology

A Suggested Plan of Study

There are also 15 credits of Cognate coursework that must be completed in order to fulfill the requirements of the Doctor of Philosophy in Educational Administration.

First Year		
Fall		Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
Credits		6
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
Possible Cognate Course ¹		3
Credits		9
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
Possible Cognate Course ¹		3
Credits		9
Second Year		
Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
Possible Cognate Course ¹		3
Credits		9
Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6525	Higher Education Law	3
Credits		9
Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6635	Higher Education Finance and Funding	3
Credits		9
Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
Possible Cognate Course(s) ¹		3-6
Credits		6-9
Spring		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Spring		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Total Credits		75-78

¹ All students can complete the 15 credits of cognate courses at their own pace but cannot start cognates until after their first semester in the program and must be complete the requirement before enrolling in ELAD 7000 Doctoral Dissertation. Students will need to coordinate with their advisor appropriately and may need to be prepared for extended time to degree if they hold off on cognates too long.

Note that the cognates listed in the Roadmap are an example of when to successfully add them to your schedule and stay on track for the four year program.

Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education Educational Leadership Doctoral Program (ELDP)

The Doctor of Education is geared toward those students wishing to pursue a degree which will help them in their profession. Coursework, internships, and research are constructed to develop individuals for administrative position in Pk-12 schools in post secondary institutions.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail message to edmandev@nmsu.edu (edmandev@nmsu.edu) or call (575) 646-3825.

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6410	Quantitative Research II	3
ELAD 6510	Qualitative Research II	3
ELAD 6520	Public School Law	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
ELAD 7000	Doctoral Dissertation	18
Total Credits		63

A Suggested Plan of Study

First Year		
Fall		Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
Credits		6
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
Credits		6
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
Credits		6

Second Year

Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
Credits		6

Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6520	Public School Law	3
Credits		9

Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
Credits		9

Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
Credits		3

Spring		
ELAD 7000	Doctoral Dissertation	6
Credits		6

Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
Credits		6

Spring		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Total Credits		63

Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy Educational Leadership Doctoral Program (ELDP)

The Doctor of Philosophy is a research-oriented degree. Coursework and internships are directed toward developing research proficiencies in educational leadership. The Ph.D. also requires additional hours of coursework in an approved cognate area.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail message to edmandev@nmsu.edu (edmandev@nmsu.edu) or call (575) 646-3825.

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6410	Quantitative Research II	3
ELAD 6520	Public School Law	3

ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6510	Qualitative Research II	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
ELAD 7000	Doctoral Dissertation	18
Cognate Coursework ¹		15
Total Credits		78

¹ Example of possible Cognate courses but not limited to the following:

- Child and Family Development
- Communication
- Feminist/Gender Studies
- Latino/a Studies
- Native American Studies
- Program Evaluation/Data Analysis
- Research Methods
- Social Justice/Critical Theory
- Sociocultural Theory
- Critical Race Theory/LatCrit
- Sociology

A Suggested Plan of Study

There are also 15 credits of Cognate coursework that must be completed in order to fulfill the requirements of the Doctor of Philosophy in Educational Administration.

First Year		
Fall		
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
Credits		6
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
Credits		6
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
Credits		6
Second Year		
Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
Credits		6
Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6520	Public School Law	3
Credits		9
Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3

ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
Credits		9
Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
Credits		3
Spring		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Spring		
ELAD 7000	Doctoral Dissertation	6
Credits		6
Total Credits		63

Engineering (Chemical Engineering) - Doctor of Philosophy

The program of study leading to the Ph.D. is available to students who have either a BS or MS in chemical engineering. Students with a BS must complete 30 course credits and 24 dissertation credits, for a total of 54 credits, including:

- required core CHME courses (14 credits);
- graduate elective courses (12 credits);
- CHME elective courses (3 credits);
- independent research as CHME 698 Ph.D. Research prior to completion of the comprehensive exam (6 credits);
- dissertation as CHME 700 after completion of the comprehensive exam (18 credits); and
- graduate seminar as CHME 690 Graduate Seminar (1 credit).

Ph.D. students must pass:

1. a qualifying examination within 24 months of starting their Ph.D. studies;
2. a comprehensive examination completed a minimum of nine months prior to the dissertation defense; and
3. an oral defense of the written dissertation before the dissertation committee.
4. PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper

accepted or published in a national or international conference proceedings.

Prefix	Title	Credits
Required Core Courses		
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 506	Graduate Transport Phenomena(s)	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME electives (select from CHME 455-CHME 589)		3
Electives ¹		12
CHME 690	Graduate Seminar	1
CHME 698	Ph.D. Research	6
CHME 700	Doctoral Dissertation	18
Total Credits		54

¹ Elective courses are intended to supplement the research work of each graduate student. These courses must be numbered 450 or above and must be approved by the dissertation advisor.

First Year		
Fall		
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME Elective		3
Credits		9
Spring		
CHME 506	Graduate Transport Phenomena(s)	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 690	Graduate Seminar	1
Credits		9
Summer		
Qualifying Exam		
Credits		0
Second Year		
Fall		
Grad Electives		6
CHME 698	Ph.D. Research	3
Credits		9
Spring		
Grad Elective		6
CHME 698	Ph.D. Research	3
Credits		9
Third Year		
Fall		
CHME 698	Ph.D. Research	6
Comprehensive Exam		
Credits		6

Spring		
CHME 700	Doctoral Dissertation	9
Credits		9
Fourth Year		
Fall		
CHME 700	Doctoral Dissertation	3
Credits		3
Spring		
Dissertation Defense		
Credits		0
Total Credits		54

During the Third Year - Fall semester students may need to take additional coursework that doesn't contribute to the 54 credit hour total in order to maintain full-time status

Engineering (Civil Engineering) - Doctor of Philosophy

In support of the mission and vision statements for the graduate program, the Civil Engineering Department adopts the following goals for the Doctor of Philosophy (Ph.D.) degree:

1. Prepare students to develop and conduct fundamental and applied research to generate innovative and original solutions for civil engineering problems.
2. Prepare students for research-based professional careers or academic careers in the civil engineering discipline.
3. Develop a culture of research/teaching scholarship among students.

Students may specialize in environmental, geotechnical, structural, transportation, or water resources engineering. Further information related to the Ph.D. degree may be found under the Academic Programs of Study (p. 31) section of the catalog.

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

Engineering (Electrical Engineering) - Doctor of Philosophy

Requirements for Ph.D. Degree

The Program Educational Objectives for the Doctorate in Electrical Engineering are:

1. That graduates obtain relevant, productive employment performing research in academia, government or industry, and/or are teaching at institutions of higher education.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree.

At the discretion of the advisor, students may complete some or all degree requirements remotely, e.g., by registering in the online sections for courses.

Note—the following degree requirement tables outline the **minimum** requirements for a Ph.D. in Electrical Engineering. As many students must register for a minimum of 9 credits each semester to remain full time, a student will often take more than the minimum of 18 credits of E E 700 Doctoral Dissertation to complete their degree. Furthermore, as students are not eligible for enrollment in E E 700 until they have passed the Ph.D. Qualifying Exam, a student will often take more than the maximum of 6 or 9 hours of E E 600 Doctoral Research.

Option 1 - Ph.D. with Completed Master's Degree

If the student has both master's and bachelor's degrees in fields other than electrical engineering, they must complete undergraduate deficiency coursework, consisting of completion of the BSEE core courses. If the student has a master's degree in a field other than electrical engineering, they must complete graduate deficiency coursework, which consists of three graduate core courses from three different areas of emphasis (see MSEE program of study for more details).

Prefix	Title	Credits
Pass Qualifying Exam ^{1,2}		
Graduate Electives (credits beyond the master's degree) ³		18
Pass Comprehensive Exam ⁴		
Doctoral Dissertation		
E E 700	Doctoral Dissertation ²	
Complete and defend doctoral dissertation ⁵		
Total Credits		32

¹ It is expected that students will take the qualifying exam within one year of their master's or entering the Ph.D. program. The qualifying exam consists of two components: completing the graduate core (see MSEE program of study for details) with a grade of B or better and presenting a written and oral summary of a topical literature review. For more details on the qualifying exam, see <https://ece.nmsu.edu/grad-study/phd-qualifying.html>.

² A student may not enroll in E E 700 Doctoral Dissertation until they have passed the qualifying exam.

³ E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. At least 9 credits must be taken in E E. At most 6 credits may be E E 600 Doctoral Research. At most 6 credits may be E E 590 Selected Topics courses that are not subtitled. Exclude credits of E E 700 Doctoral Dissertation. Exclude credits for graduate deficiency coursework if master's degree is not E E. Exclude coursework used to satisfy the master's degree requirements. Courses excluded from the MSEE and MEEE degrees are also excluded from the Ph.D. degree.

⁴ The candidate must pass a comprehensive examination after the completion of adequate coursework and demonstration of satisfactory

progress toward the doctoral dissertation. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. The written part must include a proposal for the dissertation research, and if the committee requires, it may also include a separate written exam. The written report on the proposal for the dissertation research must include the candidate's current research, planned research directions, and a reasonable timeline for completing the candidate's proposed research. The oral part may also include questions on completed coursework.

⁵ The dissertation must be completed and orally defended. Additionally, evidence must be submitted for a minimum of two publications related to the dissertation research, including one of which is submitted to an internationally recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference. Submissions must be completed prior to the final oral exam. For more details on the publication requirement, see <https://gradschool.nmsu.edu/Current%20Students/College-of-Engineering-Ph.D.-Publication-Requirement-Form1.pdf>.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

Option 2 - Direct Ph.D. with BSEE or Equivalent, but no Master's Degree

Prefix	Title	Credits
Graduate core courses (choose 3 from 3 different areas)		9-10
<i>Electromagnetics</i>		
E E 515	Electromagnetic Theory I	
<i>Microelectronics/VLSI</i>		
E E 523	Analog VLSI Design	
<i>Photonics/Optics</i>		
E E 528	Fundamentals of Photonics	
or E E 529	Lasers and Applications	
<i>Electric Energy Systems</i>		
E E 543	Power Systems III	
<i>Digital Signal Processing</i>		
E E 545	Digital Signal Processing II	
<i>Computer Engineering</i>		
E E 562	Computer Systems Architecture	
<i>Communications</i>		
E E 571	Random Signal Analysis	
<i>Controls & Robotics</i>		
E E 551	Control Systems Synthesis	
Pass Qualifying Exam ^{1,2}		
Graduate Electives ³		33-32
Pass Comprehensive Exam ⁴		
Doctoral Dissertation		
E E 700	Doctoral Dissertation ²	
Complete and defend doctoral dissertation ⁵		
Total Credits		60

¹ It is expected that students will take the qualifying exam within one year of their MSEE or entering the Ph.D. program. The qualifying exam consists of two components: completing the graduate core (see MSEE program of study for details) with a grade of B or better and presenting a written and oral summary of a topical literature review. For more details on the qualifying exam, see <https://ece.nmsu.edu/grad-study/phd-qualifying.html>.

- ² A student may not enroll in E E 700 Doctoral Dissertation until they have passed the qualifying exam.
- ³ E E courses must be numbered 500 or higher. Non-E E courses must be numbered 450 or higher. The total number of E E credits, including the graduate core and excluding credits of E E 700 Doctoral Dissertation must be at least 42. At least 21 credits must be in E E. At most 9 credits may be E E 600 Doctoral Research. At most 9 credits may be E E 590 Selected Topics courses that are not subtitled. Courses excluded from the MSEE and MEEE degrees are also excluded from the Ph.D. degree.
- ⁴ The candidate must pass a comprehensive examination after the completion of adequate coursework and demonstration of satisfactory progress toward the doctoral dissertation. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. The written part must include a proposal for the dissertation research, and if the committee requires, it may also include a separate written exam. The written report on the proposal for the dissertation research must include the candidate's current research, planned research directions, and a reasonable timeline for completing the candidate's proposed research. The oral part may also include questions on completed coursework.
- ⁵ The dissertation must be completed and orally defended. Additionally, evidence must be submitted for a minimum of two publications related to the dissertation research, including one of which is submitted to an internationally recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference. Submissions must be completed prior to the final oral exam. For more details on the publication requirement, see <https://gradschool.nmsu.edu/Current%20Students/College-of-Engineering-Ph.D.-Publication-Requirement-Form1.pdf>.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

Included Prefixes

Graduate course work credits from the following prefixes are permitted for the Ph.D. degree. If a graduate course outside this list of prefixes logically fits into the Ph.D. program, see your graduate advisor about requesting an exception.

Prefix	Title	Credits
<i>College of Agriculture/Consumer/Environmental Sciences</i>		
AEEC		
ENVS		
GENE		
<i>College of Arts and Sciences</i>		
ASTR		
BCHE		
BIOL		
C S		
CHEM		
GEOL		
GPHY		
LING		
MATH		
MOLB		
PHYS		
STAT		
<i>College of Business</i>		

ECON
MGMT
<i>College of Engineering</i>
A E
A EN
CHME
E E
ENVE
I E
M E
SUR

Excluded Courses

Credits from the following courses do not count toward a Ph.D. degree:

Prefix	Title	Credits
C S 451	C++ Programming	3
C S 452	Java Programming	3
C S 453	Python Programming I	3
C S 458	R Programming I	3
C S 460	Computer Science I Transition	3
C S 462	Object Oriented Programming Transition	3
C S 463	Introduction to Data Structures Transition	3
C S 464	Machine Programming and Organization Transition	3
C S 465	Discrete Math for Computer Science Transition	3
C S 466	Compilers and Automata Transition	3
C S 468	Software Development Transition	3
C S 469	Data Structure and Algorithms Transition	3

Engineering (Industrial Engineering) - Doctor of Philosophy

The Department of Industrial Engineering offers a Doctor of Philosophy (Ph.D.) in Engineering with a specialization in Industrial Engineering.

The program of study leading to the Ph.D. degree must include a minimum of 30 graduate credits plus 18 dissertation (I E 700) credits. Your program must also include 12 credits in related areas at the 500 level that are appropriate to your research. Typical areas include statistics, electrical engineering, mathematics, or mechanical engineering. You may not transfer in credits from your master's degree to meet this requirement. Refer to <http://ie.nmsu.edu> for a program description and current research areas.

Time Line for a Ph.D. Program

Individual programs vary, however, you can expect to spend three to five years (mostly full-time) earning your degree. Below are the key milestones of every program:

- 1. Admittance to the program and begin course work.** In coordination with your academic advisor, select 500 level courses to help you prepare for the Qualifying Exam. This would include IE topics on the general part of the exam, as well as topics related to your intended research.
- 2. Pass qualifying examination.** If you enter the program in Summer or Fall, you must take the qualifying examination in January. If you enter in Spring, you must take the qualifying examination in August. Details regarding the examination may be obtained from the department office. If you do not pass the examination on your first attempt, you

may be allowed, based on the recommendation of the faculty, to take the exam again the next time it is offered. If you do not pass the examination on your second attempt, you will be dropped from the Ph.D. program.

3. **Form your committee and prepare a research proposal.** During this time, you are expected to be a full-time student. The Graduate School requires at least one academic year of residency as defined in the Graduate Catalog. You should take at least six credits of I E 600 level courses. At this time, you should expect to file your *Program of Study* with the Graduate School.
4. **Pass the comprehensive examination.** The comprehensive examination consists of two parts: written and oral presentation of your research proposal. You must pass the examination within 24 months of passing the qualifying examination. You may not take 700 level courses until you have passed both parts of your comprehensive examination.
5. **Conduct research, write the dissertation, pass the final examination.** During this time your advisor and committee guide your work. During this time, you are enrolled for I E 700 courses. Your program must include a minimum of 18 credits of I E 700 Doctoral Dissertation. There is a minimum time span of one year between the comprehensive examination and the final oral examination (e.g., the dissertation defense). If more than five years have passed since you passed the comprehensive examination, you may be required to pass another comprehensive examination.

Ph.D. Qualifying Exam

1. Format

- Exam offered in two parts:
 - Foundations of IE, all day Thursday
 - IE Specific area exam: all day Friday.

2. Content

- **IE Foundation Portion of the Exam** (all students will take an identical exam for the foundation portion) Foundation portion consists of four areas:
 - Operations Research Deterministic and Stochastic
 - Probability and Statistics
 - Industrial Engineering Theory
 - Combination of questions from one or all of these four areas. Selection of Manufacturing, Engineering Economy, Process Improvement, Methods.
- **IE Research Topics Portion of the Exam** (Each student taking the qualifier must select two of the topics listed below for testing at least 6 weeks before the exam is offered. The student will work with his or her advisor on selecting the topics. The advisor must submit the two selected areas to the Chair of the Examining Committee at least one month before the exam is offered.)
 - Manufacturing
 - Computer/Simulation Modeling
 - Stochastic Operations Research
 - Queuing Theory
 - Design Optimization (product, facility, process, etc.)
 - Algorithmic Optimization (Dynamic cases)
 - Quality Control
 - Systems Integration and Control
 - Facility Design and Layout
 - Reliability

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifying Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in national or international conference proceedings.

Engineering (Mechanical Engineering) - Doctor of Philosophy

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Mechanical Engineering. The Degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Mechanical Engineering. Students must follow the degree requirements listed below to complete the Ph.D. course of study.

- A minimum of 36 credit hours of coursework (500 level or above) beyond the Bachelor of Science degree, at least 18 of which must support the student's research area.
- A minimum of 24 credit hours of research, M E 700 Doctoral Dissertation, which may include a maximum of 6 credit hours of M E 600 Doctoral Research. M E 600 Doctoral Research is intended for those students who have not completed the qualification examination, a prerequisite for M E 700 Doctoral Dissertation.
- A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The Ph.D. dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

Ph.D. Program Transfer Credits

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

Selection of Permanent Ph.D. Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the Ph.D. written Qualifying Examination, the Ph.D. written and oral comprehensive examination, the student's Ph.D.

committee, and the Ph.D. dissertation are contained in the department’s Graduate Program website.

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifying Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student’s doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

Experimental Psychology - Doctor of Philosophy

The Ph.D. in psychology is offered in the major areas of cognitive, engineering and social psychology. Ph.D. candidates are required to complete the following coursework and tasks:

Prefix	Title	Credits
Core Course: (corresponding to the student’s area of study)		3
PSYC 524	Cognitive Psychology	
PSYC 527	Social Psychology	
PSYC 547	Engineering Psychology	
Quantitative/Computer Methods Sequence:		9
PSYC 507	Quantitative Methods in Psychology I	
PSYC 508	Quantitative Methods in Psychology II	
PSYC 510	Computer Methodology	
Content Courses:		9
PSYC 520	Learning	
PSYC 522	Sensation and Perception	
PSYC 540	History and Systems of Psychology	
Experimental Methods:		6
PSYC 523	Methods in Cognitive Psychology	
PSYC 529	Methods in Social Psychology	
PSYC 550	Teaching of Psychology	
Comprehensive Examination: ¹		
Work related training requirement: ²		
Final Oral Examination: ³		
Dissertation:		18+
PSYC 700	Doctoral Dissertation	

¹ Pass written and oral components of the comprehensive exam

² Complete a work-related training requirement (i.e. complete an internship of at least 10 weeks duration, or teach at least one 3-credit undergraduate course independently: pre-teaching requirements listed here)

³ Pass a final oral examination that consists primarily of an evaluation of the dissertation and the candidate’s defense of it, but may extend over the entire field of the candidate’s study,

Students are encouraged to register for one credit of PSYC 590 Research Seminar in Psychology each semester.

Students should also enroll in at least one credit of the appropriate supervised research course each semester (i.e., PSYC 600 Doctoral Research, PSYC 698 Special Research Programs, or PSYC 700 Doctoral Dissertation.

When offered, PSYC 570 Special Topics may be considered content, quantitative methods, or experimental methods, depending on the specific course content.

Geography - Doctor of Philosophy

The New Mexico Doctoral Program in Geography is administered and delivered collaboratively by the Geography faculty at both New Mexico State University and The University of New Mexico. This program brings together two outstanding institutions and offers a unique opportunity for doctoral study in New Mexico’s diverse and distinctive landscapes. The program offers advantages for students by merging two departments across the state and allowing students to have access to faculty and institutional resources on both campuses. The program is designed to build both theoretical and applied knowledge in geography, which enables students to pursue a wide range of career pathways.

The New Mexico Doctoral Program in Geography builds upon the strengths of the two departments by providing the education, training, and experience necessary for professional careers in higher education, private industry, and government. The program offers a rigorous, research-based degree that is focused on environmental change, dryland resource management, complex cultural landscapes, and the methods needed to understand them. During the program, students will learn qualitative and quantitative research methods, and how to use them in combination to create a mixed-methods approach to geographic research. Expertise in multiple methodologies requires intensive study, and applicants should carefully consider their preparation to enter a program that requires both qualitative and quantitative research proficiency.

Both campuses offer state-of-the-art technical facilities, and easy access to distinctive geographic features ranging from wilderness areas to urban centers, and the Rocky Mountains to the Chihuahuan Desert. Students reside in either Las Cruces (for NMSU) or Albuquerque (for UNM) - depending on which institution is selected as the “home” university— but students will take classes on either campus, whether remotely or in-person.

On both campuses, graduate study in Geography has been characterized by a close, collegial working relationship between students and faculty and this singular program is delivered jointly at the two campuses, with collaborative participation from both faculties.

Students will travel to both campuses and experience field trips to other locations during the first-year sequence of core courses, thus gaining familiarity with two distinct communities and environments. Each student develops an individualized program of study in consultation with their dissertation committee. Individual requirements for each student are based on existing expertise and future career goals. Students will work with faculty advisors to develop a dissertation research project within the program’s three specialty areas, using appropriate research methodologies. Being a joint doctoral program, all students must have faculty from both campuses on their dissertation committee.

The program builds on existing resources and strengths at the two universities, and the curriculum will evolve to adapt to ever-changing human-environment interactions and career needs within professional geography. The program's main regional foci are New Mexico and the broader Southwest region, the Mexico-U.S. borderlands, and Latin America.

The two geography departments have complementary strengths. Students will be based at the institution where the faculty can best support their research interests. The NMSU faculty specializes in applied geographic research and teaching, particularly in the fields of geographic information science, physical geography, cultural geography, and natural resource management. The UNM department specializes in basic research, and its faculty have particular expertise in geographic information science, political ecology, historical geography, health geography, and data science. To better understand research strengths within the program, please visit the admissions pages for the Ph.D. program and review the faculty pages in the department websites at:

- **NMSU** <https://geography.nmsu.edu/about-us/faculty.html>
- **UNM** <https://geography.unm.edu/people/faculty/index.html> (<https://geography.unm.edu/people/faculty/>).

The New Mexico Doctoral Program in Geography (NMDPG) is designed to train students in both basic and applied geographic research, with a topical focus on human-environment interactions.

This program is unique because it is a consortium between two universities. This means that policies of UNM'S Office of Graduate Studies and NMSU's Graduate School together establish the general requirements for the NMDPG, which also has program-specific requirements for all students.

There are three formal course requirements for all NMDPG students. These core courses are Geog 601, GEOG 602 and GEOG 603.

All students must complete:

- at least 48 credit hours of graduate coursework.
- at least 18 credit hours of graduate coursework after completion of the Master's degree.
- at least 24 credit hours of graduate coursework at the home university.
- at least 18 credit hours of graduate coursework in UNM or NMSU courses numbered 500 or above.
- at least 18 hours of dissertation credits, which are in addition to other coursework requirements (GEOG/GESP 699 at UNM, or GEOG/GESP 700 at NMSU).
- at least three hours of graduate credit in the semester in which the comprehensive examination is taken.
- at least one hour of graduate credit in the semester in which they complete degree requirements.

Health Equity Sciences - Doctor of Philosophy

Program Description

The doctoral program in Health Equity Sciences (HES) focuses on health disparities and equity from public health, population health, and community health perspectives. Underserved and marginalized groups

experience health disparities attributable to economic, social, cultural, and environmental disadvantages at higher rates than other groups. The HES program provides advanced training to prepare graduates to become health equity researchers and to assume leadership positions in governmental (local, state, federal) and non-governmental agencies, public health and social justice organizations, health care organizations, and institutions of higher learning. Graduates will have the ability to conduct original research that addresses complex health problems, develop culturally competent community-based programs, and design and conduct program evaluations. They will be able to apply their expertise in research methodology, statistical analysis, and health communication in many settings, including rural, tribal, border, and other underserved communities. The focus of the program will be on research to address existing and emerging health disparities and health equity. Through a cooperative agreement with the University of New Mexico, students are provided with advanced comprehensive training to prepare them for positions of leadership in state, federal, and global governmental and non-governmental agencies, public health and social justice organizations, health care provider organizations, and institutions of higher learning.

Program Curriculum

NOTE: Students will participate in a mix of program-specific courses using the HES (i.e., Health Equity Sciences) prefix and graduate-level courses from across the NMSU campus and from UNM by cooperative arrangement/MOU. All HES courses will be at the doctoral level (6000 or 7000), including content offerings and research/dissertation hours; courses from across the NMSU campus will be graduate-level (5000 or higher).

Prefix	Title	Credits
Core courses (24 Credits)		
HESC 6110	Doctoral Seminar in Health Equity	3
HESC 6120	Quantitative Research Methods in Health Equity Sciences	3
HESC 6130	Seminar in Behavioral and Social Change for the Promotion of Health Equity	3
HESC 6250	Design and Evaluation of Programs to Promote Health Equity	3
Qualitative Research Elective		3
CEPY 6410 Introduction to Qualitative Research ANTH 579 Qualitative Data Analysis and Interpretation SOCI 5157 Seminar in Qualitative Research Methods COMM 506 Qualitative Research Methods in Communication		
HESC 6210	Advanced Multiple Regression for Health Equity Sciences	3
HESC 6220	Regression-Based Structural Equation Modeling for Health Equity Sciences	3
Statistics/Methods Elective (3 SCH; from a menu of HES and existing NMSU courses)		3
Tracks (12 hours)		
Select one four-course track: 1. Environmental & Occupational Health 2. Socio-Cultural & Behavioral Sciences 3. Health Across the Lifespan 4. Health Administration & Policy 5. Applied Biostatistics (shared NMSU & UNM)		
Track Elective Courses ¹		12
Completion of Preliminary Paper/Comprehensive Exam ²		
Research and dissertation courses (18 hours)		18
HESC 6991	Doctoral Research	
HESC 6997	Independent Study	
HESC 7000	Doctoral Dissertation	

*Completion of Written dissertation and oral defense*³

Total Credits	54
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¹ Track Elective courses will be determined with the consultation of the student's advisor.

² Pass written and oral components of the preliminary paper/comprehensive exam

³ Pass written and oral components of the dissertation

First Year		
Fall		Credits
HESC 6110	Doctoral Seminar in Health Equity	3
HESC 6120	Quantitative Research Methods in Health Equity Sciences	3
HESC 6210	Advanced Multiple Regression for Health Equity Sciences	3
Credits		9
Spring		
HESC 6130	Seminar in Behavioral and Social Change for the Promotion of Health Equity	3
HESC 6220	Regression-Based Structural Equation Modeling for Health Equity Sciences	3
Qualitative Research Elective		3
Credits		9
Summer		
HESC 6997	Independent Study	3
Credits		3
Second Year		
Fall		
HESC 6120	Quantitative Research Methods in Health Equity Sciences	3
HESC 6997	Independent Study	3
Statistics/Methods Elective		3
Credits		9
Spring		
Concentration Elective		3
Concentration Elective		3
HESC 6991	Doctoral Research	3
Credits		9
Summer		
HESC 6991	Doctoral Research	3
Credits		3
Third Year		
Fall		
HESC 7000	Doctoral Dissertation	3
Concentration Elective		3
Credits		6
Spring		
HESC 7000	Doctoral Dissertation	3
Concentration Elective		3
Credits		6
Total Credits		54

Kinesiology - Doctor of Philosophy Coursework

The Ph.D. in Kinesiology requires a minimum of 36 credit hours of formal coursework (beyond a masters degree) and an expected 24 credit hours of research and dissertation work. Thus, the minimum expected credit hour accumulation is 61 credit hours.

At least 12 credit hours must come from graduate courses in the department of Kinesiology. NMSU's department of Kinesiology offers courses across a range of foundational knowledge areas in Kinesiology, including:

1. Relationships among physical activity, health, and quality of life
2. Scientific foundations for the study of physical activity and human movement
3. The social, cultural, and historical context of the study of physical activity
4. The practice of physical activity

A minimum of 12 credit hours must be taken in research methodologies, at least 3 credits of which must be in experimental statistics and at least 3 credits from a qualitative methods course(s). There are many options for these courses on the NMSU campus that will permit the student to meet this requirement.

The remaining 12 credit hours are taken at the direction of the student's advisor and committee and agreed upon at the time of the student's qualifying exam (see below).

Examinations

Students seeking the Doctor of Philosophy degree in Kinesiology must pass a (1) Qualifying Examination that must be completed before accumulating more than 24 credit hours towards their degree, a (2) Comprehensive Exam including written and/or oral elements that must be completed before beginning a final dissertation project, and a (3) Final Exam that includes the defense of their final dissertation study.

Dissertation

The candidate for the degree of Doctor in Philosophy in Kinesiology must complete a dissertation in a focused area of study. The student and their committee must agree upon the dissertation topic, and approval of the dissertation requires the consent of the plurality of the student's committee members. The student must complete a minimum of 18 dissertation credit hours.

Graduate courses currently offered in the department of Kinesiology

Prefix	Title	Credits
SPMD 5310	Inferential Statistics in Sports and Exercise Science	3
SPMD 5350	Principles of Strength and Conditioning	3
SPMD 5410	Biomechanics	3
SPMD 5450	Exercise for Special Populations	3
SPMD 5510	Psychology of Sport	3
SPMD 5550	Skill Acquisition and Performance	3
SPMD 5575	Advanced Motor Development	3
SPMD 6310	The Social Construction of the Body	3
SPMD 6350	Advanced Exercise Physiology	3
SPMD 6410	Cardiovascular Physiology	3

SPMD 6450	Skeletal Muscle: Structure and Function	3
SPMD 6510	Designing Resistance Training Program	3
SPMD 6996	Special Topics	1-3
Research and Dissertation		24
SPMD 4997	Problems	
SPMD 6710	Project	
SPMD 6750	Kinesiology Research	
SPMD 7000	Doctoral Dissertation	
Total Credits		61-63

Mathematics - Doctor of Philosophy

Candidates for the Ph.D. degree in the Department of Mathematical Sciences must pass

- a qualifying examination,
- a basic comprehensive written examination,
- an advanced comprehensive examination with written and oral components, and
- a final oral doctoral thesis examination.

These are briefly described below. For more information, see the Graduate School requirements in this catalog, and the Mathematics Graduate Student handbook at www.math.nmsu.edu (<https://math.nmsu.edu/>).

Course Requirements

Prefix	Title	Credits
Core Requirements		
MATH 581	Abstract Algebra II: Fields, Rings and Modules	3
MATH 593	Measure and Integration	3
MATH 594	Real Analysis	3
MATH 595	Introduction to Functional Analysis	3

In addition to the core requirements, each student must complete one of the following four options.

Prefix	Title	Credits
Option 1		
MATH 541	Topology I	3
MATH 542	Topology II	3
MATH 582	Module Theory and Homological Algebra	3
MATH 583	Introduction to Commutative Algebra and Algebraic Geometry	3
MATH 551	Mathematical Structures in Logic	3
MATH 552	Universal Algebra and Model Theory	3
Option 2		
MATH 571	Partial Differential Equations I	3
MATH 572	Partial Differential Equations II	3
Choose two from the following:		6
MATH 582	Module Theory and Homological Algebra	
MATH 583	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 551	Mathematical Structures in Logic	
MATH 552	Universal Algebra and Model Theory	
Option 3		
STAT 562	Foundations of Probability	3
STAT 571	Continuous Multivariate Analysis	3
STAT 572	Linear Models	3
Choose two from the following:		6

MATH 582	Module Theory and Homological Algebra	
MATH 583	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 551	Mathematical Structures in Logic	
MATH 552	Universal Algebra and Model Theory	
Option 4		
STAT 562	Foundations of Probability	3
STAT 581	Advanced Theory of Statistics I	3
STAT 582	Advanced Theory of Statistics II	3
Choose two from the following:		6
MATH 582	Module Theory and Homological Algebra	
MATH 583	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 551	Mathematical Structures in Logic	
MATH 552	Universal Algebra and Model Theory	

Additional Course Requirements

A full time graduate student is required to register each semester for at least two Math/Stat graduate courses above MATH 530 Special Topics/STAT 525 Statistics: Theory and Applications. With the exception of the final semester, of these two, only one may be MATH 600 Doctoral Research or MATH 700 Doctoral Dissertation. Moreover, these two courses **must not** include:

Prefix	Title	Credits
MATH 540	Directed Reading	1-6
MATH 562	History and Theories of Mathematics Education	3
MATH 563	Algebra with Connections	3
MATH 564	From Number to Algebra	3
MATH 566	Data Analysis with Applications	3
MATH 567	From Measurement to Geometry	3
MATH 568	Using Number Throughout the Curriculum	3
MATH 569	Geometry with Connections	3
MATH 599	Master's Thesis	15
STAT 540	Directed Reading	1-6
STAT 598	Special Research Problems	1-3

Qualifying Examination

Every student admitted to the Ph.D. program must pass a written qualifying examination. Students who complete their mathematics Master's degree at NMSU may request that the Master's written examination also fulfill the Ph.D. qualifying examination requirement. In all other cases, the student takes a written Ph.D. qualifying exam. This exam is identical to the Master's written exam (based on the courses 525/527) and is administered and graded at the same time, but a higher passing score is required than for a Master's student. Ph.D. candidates need to pass the exam within their first year.

Basic Comprehensive Examinations

Every Ph.D. student must pass a Basic Comprehensive Exam, either in Algebra or in Analysis. The Algebra exam is based on the courses MATH 526 Abstract Algebra I: Groups and Rings and MATH 581 Abstract Algebra II: Fields, Rings and Modules and the Analysis exam is based on the courses MATH 528 Introduction to Real Analysis II and MATH 593 Measure and Integration.

These exams are offered every August and January. A student choosing to take the exam in Algebra must pass the exam within fourteen months

of completing Math 581; similarly, a student taking the exam in Analysis must pass the exam within fourteen months of completing MATH 593. Students failing to pass the exams within this period of time may be removed from the program. Students will normally not be given more than two attempts at any one exam.

Advanced Comprehensive Examinations

Candidates for the Ph.D. must pass an advanced comprehensive examination in their chosen research area. The examination has a written and an oral component. The written exam, which is written and administered by the student's committee, is based on two of the student's courses, normally among those listed in Options 1-4, chosen by the student in consultation with his/her committee and approved by the Graduate Studies Committee. Full-time students should complete the written component of the Advanced Comprehensive Exam after passing the Basic Comprehensive Exam and in the first two years. Those who have not made substantial progress towards completion of their written exams at the start of the fifth semester may be removed from the program. Students who have not completed the written exams by the start of the sixth semester will normally have any departmental funding revoked. The student must take the oral part of the exam at the end of the semester after completing the advanced written comprehensive exam. For the oral exam, the student should present a proposed direction for thesis work.

Final Oral Exam

This is an exam over the student's thesis. It is administered by the student's thesis committee.

Molecular Biology - Doctor of Philosophy

Prefix	Title	Credits
Phase I Core Courses		
MOLB 520	Molecular Cell Biology	3
MOLB 542	Biochemistry I	3
MOLB 545	Molecular and Biochemical Genetics	3
Molecular Biology Tier II Courses		
Select at least 9 credits from the following:		9
AGRO 516	Molecular Analysis of Complex Traits	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	
GENE 486	Genes and Genomes	
BCHE 546	Biochemistry II	
BCHE 647	Physical Biochemistry	
BIOL 451	Physiology of Microorganisms	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 490	Neurobiology	
BIOL 541	Professional Development Seminar	
BIOL 550	Special Topics	
BIOL 577	Advanced Topics in Environmental Microbiology	

BIOL 590	Neuroscience	
BIOL 698	Selected Topics	
CHEM 516	Physical Organic Chemistry	
EPWS 486	Plant Virology	
MOLB 546	Biochemistry II	
MOLB 650	Advanced Topics in Molecular Biology	
TOX 461	Toxicology I	
Other Course Requirements		
A ST 505	Statistical Inference I (or equivalent course)	4
BIOL 540	Science and Ethics	1-3
BIOL 490	Neurobiology	3
MOLB 590	Discussions in Molecular Biology	1
MOLB 597	Laboratory Rotations/Research Discussions	1-3
MOLB 700	Doctoral Dissertation Research	18
Total Credits		46-50

¹ PhD candidates must enroll for 18 credits MOLB 700 Doctoral Dissertation Research. May register for additional credits to maintain full-time status.

The Molecular Biology program also offers formal minors in molecular biology or bioinformatics.

Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice

The Doctor of Nursing Practice (DNP) degree concentration in Nurse Anesthesiology focuses on rural health and health disparities. Graduates will be qualified to take the national certification exam administered by the National Boards of Certification and Recertification of Nurse Anesthetists to become a certified registered nurse anesthetists (CRNA). In addition to the DNP core courses and nurse anesthesiology didactic course, CRNAs complete over 2000 hours of supervised clinical training. New Mexico's hospitals have a critical need for anesthesia providers throughout the state due to nation-wide shortages and difficulty recruiting providers, especially to rural healthcare centers. Without anesthesia providers, surgeries and some medical procedures cannot take place. And in all of the rural hospitals in new Mexico, CRNAs are the only anesthesia providers.

The Nurse Anesthesiology program has been developed to address this critical workforce need in the state. Qualified New Mexico applicants will be prioritized for admission.

For application information, visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/>) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-7770.

Prefix	Title	Credits
NURS 5120	Nursing Informatics	3
NURS 6110	Introduction to Population Health	1
NURS 6120	Quality Improvement in Healthcare	3
NURS 6125	Evidence-Based Practice in Healthcare	3
NURS 6130	Epidemiology for Advanced Nursing Practice	2
NURS 6135	Interdisciplinary Leadership and Role Development for Practice Excellence	3

NURS 6150	Advanced Anatomy	3
NURS 6155	Advanced Physiology	4
NURS 6215	Professional Aspects of Nurse Anesthesiology Practice	3
NURS 6230	Advanced Clinical Pharmacology	3
NURS 6235	Advanced Pathophysiology for Nurse Anesthesiology Practice	4
NURS 6240	Advanced Health Assessment for Nurse Anesthesiology Practice	4
NURS 6245	Advanced Pharmacology for Nurse Anesthesiology Practice	3
NURS 6250	Healthcare Policy and Ethics	3
NURS 6255	Innovations and Health Care Organizations	3
NURS 6265	Strategic and Financial Planning for Population Health Programs	3
NURS 6270	Clinical Data Management and Analysis	2
NURS 6305	Introduction to the DNP Project	1
NURS 6307	DNP Project Practicum (Can be repeated 2 semesters for a total of 2-9 credits)	2
NURS 6310	DNP Project I	1
NURS 6320	DNP Project II	1
NURS 6330	DNP Project III	1
NURS 6610	Nurse Anesthesiology Principles I	4
NURS 6620	Nurse Anesthesiology Principles II	4
NURS 6630	Nurse Anesthesiology Principles III	4
NURS 6640	Nurse Anesthesiology Principles IV	4
NURS 6720	Nurse Anesthesiology Clinical Residency II	3
NURS 6770	Rural Health Anesthesiology Seminar	3
NURS 6771	Anesthesiology Integration/Clinical Correlation I	4
NURS 6710	Nurse Anesthesiology Clinical Residency I	3
NURS 6730	Nurse Anesthesiology Clinical Residency III	2
NURS 6740	Nurse Anesthesiology Clinical Residency IV	3
NURS 6750	Nurse Anesthesiology Clinical Residency V	4
NURS 6760	Nurse Anesthesiology Clinical Residency VI	2
Total Credits		96

New Mexico State University is a full member of the National Council of State Authorization Reciprocity Agreements consortium (SARA). Students will need to check the N (<https://online.nmsu.edu/check-your-state/>)MSU SARA website (https://online.nmsu.edu/state_authorization/Check%20Your%20State.html) before application to determine if NMSU has a reciprocity agreement with their home state before application is made.

The Doctor of Nursing Practice (DNP) degree concentration in Nurse Anesthesiology focuses on rural health and health disparities. Graduates will be qualified to take the national certification exam administered by the National Boards of Certification and Recertification of Nurse Anesthetists to become a certified registered nurse anesthetists (CRNA). In addition to the DNP core courses and nurse anesthesiology didactic course, CRNAs complete over 2000 hours of supervised clinical training.

For application information, visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/>) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-7770.

First Year		
Fall		Credits
NURS 5120	Nursing Informatics	3
NURS 6120	Quality Improvement in Healthcare	3
NURS 6150	Advanced Anatomy	3
NURS 6155	Advanced Physiology	4
Credits		13
Spring		
NURS 6125	Evidence-Based Practice in Healthcare	3
NURS 6235	Advanced Pathophysiology for Nurse Anesthesiology Practice	4
NURS 6230	Advanced Clinical Pharmacology	3
NURS 6240	Advanced Health Assessment for Nurse Anesthesiology Practice	4
Credits		14
Summer		
NURS 6245	Advanced Pharmacology for Nurse Anesthesiology Practice	3
NURS 6265	Strategic and Financial Planning for Population Health Programs	3
NURS 6610	Nurse Anesthesiology Principles I	4
Credits		10
Second Year		
Fall		
NURS 6130	Epidemiology for Advanced Nursing Practice	2
NURS 6255	Innovations and Health Care Organizations	3
NURS 6620	Nurse Anesthesiology Principles II	4
NURS 6710	Nurse Anesthesiology Clinical Residency I	3
Credits		12
Spring		
NURS 6110	Introduction to Population Health	1
NURS 6135	Interdisciplinary Leadership and Role Development for Practice Excellence	3
NURS 6305	Introduction to the DNP Project	1
NURS 6630	Nurse Anesthesiology Principles III	4
NURS 6720	Nurse Anesthesiology Clinical Residency II	3
Credits		12
Summer		
NURS 6215	Professional Aspects of Nurse Anesthesiology Practice	3
NURS 6307	DNP Project Practicum	1
NURS 6310	DNP Project I	1
NURS 6640	Nurse Anesthesiology Principles IV	4
NURS 6730	Nurse Anesthesiology Clinical Residency III	2
Credits		11
Third Year		
Fall		
NURS 6740	Nurse Anesthesiology Clinical Residency IV	3
NURS 6320	DNP Project II	1
NURS 6307	DNP Project Practicum	1
Credits		5
Spring		
NURS 6270	Clinical Data Management and Analysis	2
NURS 6250	Healthcare Policy and Ethics	3
NURS 6330	DNP Project III	1
NURS 6750	Nurse Anesthesiology Clinical Residency V	3
Credits		9

Summer

NURS 6771	Anesthesiology Integration/Clinical Correlation I	4
NURS 6760	Nurse Anesthesiology Clinical Residency VI	2
NURS 6770	Rural Health Anesthesiology Seminar	3
Credits		9
Total Credits		95

New Mexico State University is a full member of the National Council of State Authorization Reciprocity Agreements consortium (SARA). Students will need to check the NMSU SARA website (https://online.nmsu.edu/state_authorization/Check%20Your%20State.html) before application to determine if NMSU has a reciprocity agreement with their home state before application is made.

Physics - Doctor of Philosophy

For the Ph.D. degree, students must also pass the doctoral comprehensive examination, carry out original research, complete a dissertation, and pass a final oral examination. They must also pass or transfer at least 36 credits in formal courses numbered above 500 in physics/geophysics, including 24 credits of core graduate courses, and complete at least 6 credits of formal courses numbered above 600. The total number of credits, including formal and informal course credits and a minimum of 18 dissertation credits, must be at least 72. Financial support is available to graduate students in physics through teaching and research assistantships and fellowships. Inquiries about these opportunities should be directed to the graduate program director.

Requirements

Prefix	Title	Credits
Core Courses		
PHYS 511	Mathematical Methods of Physics I	3
PHYS 551	Classical Mechanics	3
PHYS 554	Quantum Mechanics I	3
PHYS 555	Quantum Mechanics II	3
PHYS 561	Electromagnetic Theory I	3
PHYS 562	Electromagnetic Theory II	3
PHYS 576	Advanced Computational Physics I	3
PHYS 584	Statistical Mechanics	3
Select 3 credits from the following:		3
PHYS 571	Advanced Experimental Optics	
PHYS 575	Advanced Physics Laboratory	
PHYS 593	Advanced Experimental Nuclear Physics	
Total Credits		27

Plant and Environmental Science - Doctor of Philosophy

Candidates for a Ph.D. degree in Plant and Environmental Sciences are expected to demonstrate (via course work and independent study) a thorough understanding and proficiency in their chosen major, and if applicable, a minor area. Courses numbered 450-499 are designed for senior undergraduates and graduate students; 500-599 are for graduate students working on a master's or doctoral degree; 6000-7000 are principally for students working on a doctoral degree. Qualifications for admission will be reviewed by the departmental graduate faculty.

Minimum Grade Point Average and Credit Hour Requirements: Your Doctorate degree requires a minimum of 30 completed degree hours beyond the Master's degree, or 60 degree hours beyond the Bachelor's degree, and a minimum GPA of 3.00 in all course work.

Degree residency requirement: 24 credits must be completed at NMSU.

Departmental Requirements: Selection of courses should be based on consultation with the student's graduate committee.

- Complete 2 credits of PLEN Seminar coursework: one credit each of AGRO 590 Graduate Seminar/HORT 590 Graduate Seminar/SOIL 590 Graduate Seminar and PLEN 6910 Doctoral Seminar.
- Complete 9 credits of course work numbered above 600: **exclusive** of PLEN 6991 Doctoral Research and PLEN 7000 Doctoral Dissertation credit.
- Complete at least 18 credits in PLEN 7000 Doctoral Dissertation after passing the comprehensive exam. A student may initially enroll in PLEN 7000 Doctoral Dissertation credits during the same semester that they take their comprehensive exam. However, this option is not recommended because if the student does not pass the exam, the 700-level credits will not count. Consequently, enrollment status, assistantship eligibility, and resident tuition rate eligibility could be jeopardized.
- Complete sufficient credits numbered 450 or above to bring total graduate credits to a minimum of 30 beyond the Master's degree, or a minimum of 60 credits beyond the Bachelor's degree.
- Complete a Qualifying Examination during the first (recommended) or second semester of study.
- Complete a written and oral Comprehensive Examination of the student's field of study.
- Complete a written Doctoral Dissertation.
- Complete a final oral defense of the Doctoral Dissertation.
- Complete one of the following requirements, as approved by the doctoral committee:
 - A thorough knowledge of a language other than English
 - A reading ability in two foreign languages
 - Reading ability in one foreign language and proficiency with a research tool
 - Reading ability in one foreign language and one semester of supervised teaching experience
 - Proficiency with a research tool and one semester of supervised teaching
 - Two semesters of supervised teaching

Range Science - Doctor of Philosophy

A GPA of 3.0 or higher is required for admission. GRE exam is required. Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined by the admissions committee and the student's graduate committee and advisor.

A minimum of 30 credits of graduate work plus 18 credits of dissertation (RGSC 700) are required to graduate. The Qualifying Exam will take place during the first semester of graduate work. Its purpose is to evaluate the student's strengths and weaknesses, determine deficiency courses,

and discuss a possible program of study (coursework). The “Program of Study and Committee for Doctoral Students” form, listing the graduate committee and courses to be taken, should be filed with the Graduate School after completion of 12 credits and after the qualifying exam, and before registering for additional courses. The Comprehensive Exam is intended to test the knowledge of the major and minor fields of study. The student will be admitted to the exam after fulfilling the language/research tool requirement, after completion of adequate coursework (as determined by the department and the Graduate School), and when considered by the student’s graduate committee to be adequately prepared. The exam is part written and part oral. The student is formally considered a candidate for the Ph.D. only after the successful completion of the comprehensive exam, the recommendation of the committee, and the approval of the graduate dean.

The research project must be approved by the student’s graduate committee. The dissertation is expected to demonstrate the student’s ability in independent investigation and to be a contribution to human knowledge. It shall display a mastery of the literature, present an organized, coherent development of ideas with a clear exposition of results, and provide a critical discussion of the student’s conclusions. Every effort should be made to publish the dissertation as scientific journal articles. Final Exam is concerned primarily with the research work of the student as embodied in the dissertation, but it may also extend over the entire field of study. It is entirely oral. The final exam will be advertised to the public one week prior to the exam.

Rhetoric and Professional Communication - Doctor of Philosophy

An MA is required for admission to the PhD program. Students in the doctoral program will develop individualized plans of study in consultation with advisors. Students are required to take

- 60 hours of graduate-level coursework including the doctoral proseminar in the first semester;
- courses in research methods;
- core courses in composition, professional and technical communication, and rhetoric;
- additional coursework in an area of specialization determined in consultation with an advisor;
- an internship; and
- a dissertation.

The Ph.D. also requires a qualifying portfolio, a comprehensive examination and an oral examination. The dissertation must be completed and approved within 5 years after the comprehensive exam. Consult the department for additional instructions regarding the internship, qualifying comprehensive examinations, portfolio and dissertation.

Requirements

Prefix	Title	Credits
Program Requirements		
ENGL 610	Proseminar in Rhetoric and Professional Communication	3
ENGL 597	Internship in Technical and Professional Communication	3

ENGL 600	Doctoral Research	3-15
ENGL 700	Doctoral Dissertation	15
Methods Courses		3
Select one from the following		
ENGL 548	Graduate Study in Empirical Research	
ENGL 601	Qualitative Research	
ENGL 602	Quantitative Research	
ENGL 604	Digital Research Methods	
Core Courses		
Select four from the following core courses:		12
<i>Core Composition Courses (select one)</i>		
ENGL 664	History and Theory of Composition Studies	
ENGL 683	Critical Writing Studies	
<i>Core Professional and Technical Communication Courses (select one)</i>		
ENGL 502	Critical Conversations in Technical and Professional Communication	
ENGL 572	Technical-Professional Communication Pedagogies	
ENGL 643	Multimedia Theory and Production	
<i>Core Rhetoric Courses (select two)</i>		
ENGL 518	History of Rhetoric	
ENGL 519	Graduate Study in Modern Rhetorical Theory	
ENGL 668	Rhetoric and Cultural Studies	
Specialized Courses		
Select 21 credits in specialized area determined in consultation with an advisor. ²		21
Transfer Credits (18 credits)		18
Total Credits		78-90

¹ Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

² Students define their specialized area, a coherent set of related courses drawn from both inside and outside the Department of English, in consultation with their doctoral committee. Possible specializations include Border Rhetorics and Cultures; Writing Program Administration/Writing Center Administration; Assessment; Pedagogy; Literacy Studies; Identity and Political and Social Rhetoric; New Media Rhetoric and Design; Intercultural Rhetorics; Writing Across the Curriculum; Workplace Communication; and the Rhetoric of Science. Up to 6 hours may be taken outside of English.

Transfer Courses (18 credits)

In consultation with an advisor and the Doctoral Committee, courses taken at the Master’s level can be used to waive specific area requirements in the PhD, but this will not reduce the minimum number of credits required.

Financial Support

Students are eligible for teaching assistantships and a variety of positions that involve writing around campus and the community. Because many students work full time, many courses are offered in the late afternoon and evening to accommodate various schedules.

Application Information

Please refer to the online application process described on the NMSU Admissions website for specific instructions for each program.

School Psychology - Doctor of Philosophy

The mission of the School Psychology doctoral program is to prepare school psychologists as scientists, practitioners and advocates for mental health and social justice in health service psychology settings, including public schools. The program addresses state and national shortages of personnel fully credentialed to serve the needs of children with disabilities. The primary goal of the school psychology program is to prepare scholars to become problem-solvers with the essential entry-level competencies to serve in the schools and agencies that serve school-age populations.

The program develops three major components: 1) *Knowledge of psychological and educational foundations*; 2) *Skills in data-based decision-making, assessment, consultation, intervention, and research*; and 3) *The capacity to apply knowledge and skills to promote mental health and development and prevent school failure and other disabling conditions*. Specifically, the program will accomplish the following goals.

1. Prepare and graduate highly qualified school psychologists to meet the academic and psychological needs of infants, toddlers, children, youth, and their families from diverse backgrounds (i.e., high-need children with disabilities).
2. Increase the number of personnel who demonstrate the competencies needed to provide high-quality instruction, evidence-based interventions, and services for children with disabilities.
3. Retain scholars in a high quality-training program to increase the numbers of school psychologists including scholars from bilingual and traditionally underrepresented backgrounds.

Annual Application Deadline: January 15

For more information on program application requirements and process, see School Psychology, Ph.D. program website: <https://cep.nmsu.edu/academic-programs/school-psychology-phd.html>

Curriculum

Preparation occurs from a developmental sequence of courses that follow scientifically based research and empirically validated strategies. The school psychology program at NMSU adheres to the scientist-practitioner model. This integrated approach to scholarship and practice promotes development of interlocking skills fostering a career-long process of psychological investigation, assessment, and intervention. Throughout the curriculum, the importance of knowledge and experience with a wide range of individual differences including, but not limited to ethnicity, gender, disability, age, culture, sexual orientation, religion, and race are emphasized. Ethical and legal issues, which guide service delivery, are also stressed throughout the curriculum. The American Psychological Association (APA) and National Association of School Psychologists (NASP) Standards and competencies provide the foundation for the program's conceptual framework. Candidates will complete 81 credits of coursework, at least 450 clock-hours of practica (9 total credits) and an 1800 clock-hour doctoral internship. Of the 1800 clock-hour internship, 750 will be expected to be in a school setting.

Program of Study

Prefix	Title	Credits
CEPY 5310	Appraisal of Psychoeducational Achievement in a Diverse Society	3
CEPY 6160	History and Systems of Psychology	3

CEPY 5235	Counseling Theory and Techniques for School Psychologists	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 6180	Physiology of Behavior	3
CEPY 6265	Diagnostic Class	3
CEPY 6120	Human Development	3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6220	Spanish for Mental Health Professionals	3
CEPY 6130	Psychology of Multiculturalism	3
CEPY 6170	Psychology of Poverty	3
SPED 6170	School Intervention and Organization in a Diverse Society	3
CEPY 6185	Ethics, Law & Professional Issues in School Psychology	3
CEPY 6210	School Psychology Research and Program Evaluation	3
CEPY 6410 or EDUC 6440	Introduction to Qualitative Research Qualitative Research I	3
CEPY 6430	Advanced Statistics	3
CEPY 6440	Multivariate Statistics	3
CEPY 6420	Psychometrics	3
CEPY 6330	Academic & Behavioral Assessment & Intervention	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6350	Appraisal of Personality	3
CEPY 6240	Child and Adolescent Counseling Theory and Technique	3
CEPY 6250	Family Therapy Theory and Technique	3
CEPY 6260	Consultation	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	3
CEPY 6530	Practicum in School Psychology: Psychological	3
CEPY 6520	Field Experience in Educational Diagnostics	3
CEPY 6580	Supervision Theory and Practicum	3
CEPY 6540	Advanced Multicultural School Psychology Field Experience	3
CEPY 6640	Doctoral Internship in School Psychology	12
CEPY 6450	Educational Experimentation	3
CEPY 7000	Doctoral Dissertation	18

Total Credits

120

Water Science and Management - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518 or SOIL 456	Watershed Methods and Management Irrigation and Drainage	3
C E 557	Water Resources Development	3

Select one from the following:	3-4
GEOG 578 Fundamentals of Geographic Information Science (GIS)	
GEOG 588 GIS and Water Resources	
Select one from the following: ¹	3-4
A ST 505 Statistical Inference I	
C E 582 Statistical Hydrology	
GEOG 585 Spatial Analysis and Modelling	
Seminar Credits OR Select one from the following: ²	2
WSAM 605 Arid Land Water Resources	
WSAM 610 Water and Sustainable Economic Development	
GEOG 501 Research Design and History of Geographic Thought	
Electives/transfer credits chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)	40
Dissertation	
WSAM 700 Doctoral Dissertation	18
Total Credits	75-77

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science (GIS), or FWCE 535 Special Topics.

Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
GEOG 588	GIS and Water Resources	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	

GEOG 585	Spatial Analysis and Modelling	
Seminar Credits OR Select one from the following: ²		2-3
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Agricultural Water Resources concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		28
Dissertation		
WSAM 700	Doctoral Dissertation	18
Total Credits		75-78

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science (GIS), or FWCE 535 Special Topics.

Water Science and Management (International Water Resilience) - Doctor of Philosophy

Prefix	Title	Credits
WSAM 590	System Dynamics	3
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
A ST 505	Statistical Inference I	4
WSAM 595	Hands-On Transboundary Aquifer and Community System Convergence Seminar	8
WSAM 598	Internship	3
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
WSAM 550	Special Topics	3
Choose one course from the following:		3
GEOG 602	Integrative Research Design	
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
Choose one course from the following:		3
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
GEOG 588	GIS and Water Resources	
Choose one course from the following:		3
GEOG 585	Spatial Analysis and Modelling	

ANTH 579	Qualitative Data Analysis and Interpretation	
POLS 502	Research Methods in Government	
POLS 503	Qualitative Research Methods	
POLS 537	Issues in Public Policy	
SOCI 5157	Seminar in Qualitative Research Methods	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SOCI 5153	Seminar in Sociological Research	
WSAM 700	Doctoral Dissertation	18
Relevant committee-approved electives/transfer credits (enough to meet the required minimum of 75 credits)		14
Total Credits		75

Water Science and Management (Water Economics and Policy) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
GEOG 588	GIS and Water Resources	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credits OR Select one from the following: ²		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration courses		
ECON 457	Mathematical Economics	3
AEEC 540	Econometrics I	3
or ECON 545	Econometrics II	
AEEC 501	Microeconomic Theory	3
Students must work with their committee to select 3 credits of elective course(s) that would meet the Water Economics and Policy concentration		3
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		28
Dissertation		
WSAM 700	Doctoral Dissertation	18
Total Credits		75-77

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science (GIS), or FWCE 535 Special Topics.

Ideas for Water Economics & Policy Electives

- AEEC 575 Economics of Water Resource Management and Policy
- PHLS 4130 Environmental Health
- ECDV 651 Economic Development Theory
- ECDV 661 Regional Economic Modeling
- ECDV 664 Population Economics
- ECDV 668 Economic Development Finance
- ECDV 671 Sustainable Economic Development
- PHLS 5150 Environmental Public Health Issues
- PHLS 5640 Rural Health Issues
- PHLS 5660 U.S.-Mexico Border Health Issues

Water Science and Management (Water Informatics) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
GEOG 588	GIS and Water Resources	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credits OR Select one from the following: ²		2
WSAM 605	Arid Land Water Resources	

WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Water Informatics concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		28
Dissertation		
WSAM 700	Doctoral Dissertation	18
Total Credits		75-77

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science (GIS), or FWCE 535 Special Topics.

Water Science and Management (Water Quality Treatments) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
GEOG 588	GIS and Water Resources	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credits OR Select one from the following: ²		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	
Concentration Electives		

Students must work with their committee to select 12 credits of elective courses that would meet the Water Quality Treatment concentration

Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits) **28**

Dissertation

WSAM 700	Doctoral Dissertation	18
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Total Credits **75-77**

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science (GIS), or FWCE 535 Special Topics.

Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 575	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
GEOG 588	GIS and Water Resources	
Select one from the following: ¹		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modelling	
Seminar Credits OR Select one from the following: ²		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Research Design and History of Geographic Thought	

Concentration Electives

Students must work with their committee to select 12 credits of elective courses that would meet the Watersheds and Aquatic/Riparian Wetlands concentration

Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		28
Dissertation		
WSAM 700	Doctoral Dissertation	18
Total Credits		75-77

¹ With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modelling may be used as a substitute.

² Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Research Design and History of Geographic Thought.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of Geographic Information Science (GIS), or FWCE 535 Special Topics.

School Psychology - Specialist in Education

The CEP Department offers a School Psychology program that leads to a Specialist in Education (Ed. S.) degree. The program is accredited by the National Association of School Psychologists. The program provides additional education beyond the M.A. degree to prepare professionals for licensure as school psychologists in New Mexico and throughout the United States. The School Psychology program prepares its candidates to work with preschoolers, children, adolescents, and families. The various settings where School Psychologists are employed include public schools and other organizations that require advanced assessment, counseling, consultation, and other interventions. The program trains its candidates to serve students with diverse educational, psychological, and emotional needs from various backgrounds. Such training also includes working with all school personnel to help make education a positive and rewarding student experience.

Annual application deadline: January 15

For more information on program application requirements and process, see School Psychology, Ed.S., program website:

<https://cep.nmsu.edu/academic-programs/school-psychology.html>

Program of Study

Prefix	Title	Credits
CEPY 5310	Appraisal of Psychoeducational Achievement in a Diverse Society	3
CEPY 5235	Counseling Theory and Techniques for School Psychologists	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 5997	Special Research Programs	3
CEPY 6265	Diagnostic Class	3
CEPY 6120	Human Development	3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6130	Psychology of Multiculturalism	3
SPED 6170	School Intervention and Organization in a Diverse Society	3

CEPY 6185	Ethics, Law & Professional Issues in School Psychology	3
CEPY 6420	Psychometrics	3
CEPY 6210	School Psychology Research and Program Evaluation	3
CEPY 6330	Academic & Behavioral Assessment & Intervention	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6350	Appraisal of Personality	3
CEPY 6240	Child and Adolescent Counseling Theory and Technique	3
CEPY 6250	Family Therapy Theory and Technique	3
CEPY 6260	Consultation	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	3
CEPY 6530	Practicum in School Psychology: Psychological	3
CEPY 6610	Internship in School Psychology	12
Total Credits		72

Autism and Spectrum Disorders - Graduate Certificate

Prefix	Title	Credits
SPED 5310	Introduction to Autism	3
SPED 5320	Behavior and Autism	3
SPED 5330	Social Skills and Autism	3
SPED 5340	Communication and Autism	3
or SPS 5360	Communication Disorders in Neurodiverse Populations	
Total Credits		12

Borderlands and Ethnic Studies - Graduate Certificate

Borderlands and Ethnic Studies (BEST) is a multidisciplinary program that critically explores the social, historical, cultural, and legal ways communities experience and navigate social constructs such as race, gender, and sexual orientation. These constructs permeate life, are entrenched in social structures and institutions, and shift and mutate over place and time in ways that reproduce existing power relations. The program outlines and analyzes the history, cultural production, politics and consequences of racialization and identity formation from an Indigenous, Diasporic and Transnational/Transborder, Decolonizing approach that remains rooted in a place-based, Borderlands imperative.

The graduate certificate advances an understanding of human relationships informed by unequal power and resource distribution to prepare students for service in various fields such as: education, government, law enforcement, health, environmental justice, sustainable agriculture, communications, social work, law and policy, public history, business and social entrepreneurship, and others. The certificate addresses a growing need for knowledge and skills in the areas of cultural competency, equity and inclusion, critical thinking and conscientious problem solving, and effectively working with diverse populations.

Within the field of education, currently employed teachers and future teachers will be trained in historical and contemporary knowledge of Borderlands and ethnic Studies through a locally-relevant approach. nationally, Ethnic Studies is part of a burgeoning K-12 and higher

education focus because of its potential for creating stronger and healthier communities. This certificate serves a growing cadre of educators as well as others pursuing careers in the public services sector. The certificate is comprised of 15 credits of graduate level work.

The certificate serves:

- Current NMSU degree seeking graduate students who wish to expand their primary area of study to include a specialization in Borderlands and Ethnic Studies.
- Non-degree seeking professionals who have completed an undergraduate degree in any major and who wish to invite, refresh, update and extend their knowledge and skill sets in Borderlands and Ethnic Studies.

Overview

The Graduate Certificate in Borderlands and Ethnic Studies is offered in the traditional classroom format as well as on-line. The program is designed to be completed in 4 semesters, with a requirement to successfully culminate in completion of BEST 513 Capstone in Borderlands and Ethnic Studies - which will be tailored to the students' trajectory. Students must earn a minimum 3.0 in all 5 courses, including the Elective.

The certificate may be completed as a stand-alone certification or in conjunction with a graduate degree in another field.

If you wish to complete a graduate certificate, you must apply for admission to this program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to file a Completion of Graduate Certificate form to be awarded the certificate.

Please contact the Borderlands and Ethnic Studies Advisor to further assist in completion of the application.

Prefix	Title	Credits
Requirements		
BEST 510	Foundations in Borderlands & Ethnic Studies	3
BEST 511	Methodologies in Borderlands and Ethnic Studies	3
BEST 512	Theories in Borderlands and Ethnic Studies	3
BEST 513	Capstone in Borderlands and Ethnic Studies	3
Elective Course ¹		3
Total Credits		15

¹ Student and director selection

A Suggested Plan of Study

First Year		
Fall		
BEST 510	Foundations in Borderlands & Ethnic Studies	3
Credits		3
Spring		
BEST 511	Methodologies in Borderlands and Ethnic Studies	3
Credits		3

Second Year

Fall		
BEST 512	Theories in Borderlands and Ethnic Studies	3
Elective Course ¹		3
Credits		6
Spring		
BEST 513	Capstone in Borderlands and Ethnic Studies	3
Credits		3
Total Credits		15

¹ Student and Director selection

Cultural Resource Management - Graduate Certificate

The Graduate Certificate in Cultural Resource Management provides specialized archaeological training that enables students to pursue careers cultural resource management, heritage, and historic preservation in the public or private sectors. The curriculum includes cultural resource management and historic preservation laws and regulations, area classes in prehistoric and historical archaeology, field classes, and laboratory methods courses in archaeology, history, and geography. Students take courses in traditional classroom and laboratory formats, as well as in the field. The core requirements (ANTH 540 Cultural Resource Management and ANTH 542 Cultural Resource Management II) are offered during the fall (ANTH 540) and spring (ANTH 542) semesters *every other year*. If you enroll in a year when these courses are not being offered, it will take you at least two years to complete your certificate.

The Certificate may be completed as a stand alone certification or in conjunction with the M.A. degree in Anthropology or any other related field.

If you wish to complete a graduate certificate, you must apply (<https://gradschool.nmsu.edu/>) for admission to this non-degree program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to apply to be awarded the certificate through your myNMSU account.

Please contact the Anthropology Graduate Advisor, Dr. Kelly Jenks kljenks@nmsu.edu (istanfor@nmsu.edu) for information about how to complete the application.

The Graduate Certificate in Cultural Resource Management requires 18 credits of coursework and must be completed within 3 years. The certificate requires six credits from two required courses and 12 credits from a comprehensive list of electives in anthropology and cognate fields. Students are required to take at least one course in History or Geography. All these courses are designed to promote expertise in cultural resource management. The core requirements (ANTH 540 Cultural Resource Management and ANTH 542 Cultural Resource Management II) are offered during the fall (ANTH 540) and spring (ANTH 542) semesters *every other year*. If you enroll in a year when these courses are not being offered, it will take you at least two years to complete your certificate.

Prefix	Title	Credits
Required Courses		
ANTH 540	Cultural Resource Management	3
ANTH 542	Cultural Resource Management II	3
Elective Courses		12
Select 12 credits from the following: ^{1,2}		
At least three credits must be in HIST or GEOG		
ANTH 455	Federal Indian Policy	
ANTH 507	Advanced Studies in Archaeology	
ANTH 512	Quantitative Analytical Methods in Anthropology	
ANTH 516	Advanced Archaeology of the American Southwest	
ANTH 514	Advanced Issues in the Archaeology of Religion	
ANTH 518	Advanced Historical Archaeology	
ANTH 522	Archaeological Field School-Graduates	
ANTH 523	Archaeological Mapping	
ANTH 564	Advanced Curation Crisis in Archaeology	
ANTH 574	Advanced Human Osteology	
ANTH 576	Lithic Technology Organization	
ANTH 577	Advanced Zooarchaeology	
ANTH 578	Advanced Lab Methods in Archaeology	
GEOG 553	Geomorphology	
GEOG 573	Introduction to Remote Sensing	
GEOG 578	Fundamentals of Geographic Information Science (GIS)	
HIST 579	Oral History	
HIST 586	Interpreting Historic Places for the Public	
HIST 583	Advanced Historic Preservation	
HIST 594	Public History Seminar	
Total Credits		18

¹ Some of these courses have prerequisites, consult the graduate catalog for details.

² Other classes maybe included in the list of elective courses at the discretion of the Department and with approval of the Anthropology Department Head.

Digital Communications - Graduate Certificate

Digital Communications focuses on the problem of transmitting information from one place to another through some medium (e.g., RF wireless). This certificate introduces students to the basic theory as well as the application of that theory.

A 3.0 minimum cumulative GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Deva Borah, International Foundation of Telemetering and Telecommunications Professor and Professor of the Klipsch School of Electrical and Computer Engineering, (575) 646-3357.

Prefix	Title	Credits
Required Courses		
E E 571	Random Signal Analysis	6
E E 581	Digital Communication Systems I	
<i>Electives (six credits from the following):</i>		<i>6</i>

E E 545	Digital Signal Processing II	
E E 572	Modern Coding Theory	
E E 583	Wireless Communications	
E E 586	Information Theory	
Total Credits		12

Digital Signal Processing - Graduate Certificate

Digital Signal Processing (DSP) focuses on the processing and analysis of digitized signals. This certificate introduces students to the basic theory as well as the application of that theory.

A 3.0 minimum cumulative GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Charles Creusere, Frank Carden Chair in Telecommunications and Telemetering and Professor of the Klipsch School of Electrical & Computer Engineering, (575) 646-3919.

Prefix	Title	Credits
Required Courses		
E E 545	Digital Signal Processing II	6
E E 571	Random Signal Analysis	
<i>Electives (six credits from the following):</i>		<i>6</i>
E E 565	Machine Learning I	
E E 588	Advanced Image Processing	
E E 596	Digital Image Processing	
E E 597	Neural Signal Processing	
Total Credits		12

Electric Energy Systems - Graduate Certificate

Electric Energy Systems in recent times has started to develop a cross-disciplinary aspect due to developments and investments in the areas of renewables and smart electric grid technology. This trend is only likely to intensify over the years. Thus, in addition to the engineers already working in the area of electric energy systems, engineers from other areas in electrical and computer engineering may feel the need to develop core knowledge in the area of Electric Energy Systems, which is provided by this program.

A 3.0 minimum GPA in four courses (12 credits) as described below will be required for the awarding of this certificate. Dr. Sukumar Brahma, Associate Director of the Electric Utility Management Program and Associate Professor of the Klipsch of Electrical and Computer Engineering, (575) 646-7117.

Prefix	Title	Credits
Required Courses		
E E 542	Power Systems II	6
E E 543	Power Systems III	
<i>Electives (six credits from the following):</i>		<i>6</i>
E E 534	Power System Relaying	
E E 537	Power Electronics	
E E 544	Distribution Systems	
Total Credits		12

Elementary Education Alternative Licensure - Graduate Certificate

The NMSU Elementary Alternative Licensure Certificate aims to recruit highly qualified individuals who have earned at least a bachelor's degree in a related field and are eligible for a temporary two-year alternative license in the State of New Mexico. We seek individuals who will have positive impact on the social, cultural, emotional, and intellectual growth of youth with whom they will work throughout their career.

In order to qualify to enter the Elementary Education Alternative Licensure Certificate program, applicants must meet the following minimum requirements and submit the required documentation for consideration:

- Meet minimum state requirements of *at least* a bachelor's degree and course requirements of 30 undergraduate credit hours (6.60.3.7 NMAC) in the teaching field with a minimum 2.75 cumulative undergraduate GPA.
- Passing scores for all *Praxis*® Core Academic Skills for Educators (Core): <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>)
- Be hired and submit a copy of a current teaching contract from a school district in New Mexico that indicates the candidate is the teacher of record in an elementary classroom for each year of employment.
- Admission to the School of Teacher Preparation, Administration, and Leadership in the College of Education.
- Admission to the NMSU Graduate School (<https://gradschool.nmsu.edu/>)

Prefix	Title	Credits
Required Courses		
EDUC 5120	Multicultural Education	3
EDUC 5310	Methods of Teaching Elementary School Science	3
EDUC 5320	Methods of Teaching Elementary School Mathematics	3
EDUC 5330	Methods of Teaching Elementary School Social Studies	3
READ 5310	Elementary School Literacy I	3
READ 5320	Elementary School Literacy II	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
Total Credits		21

All licensure courses are eligible for transfer into a regular TPAL master's program.

Other Program Requirements to be completed by the end of the two-year program:

- Complete and maintain a 3.0 minimum GPA in all courses throughout the program
- Participate in two full semesters of observation by a University Supervisor with a fee for each semester
- Pass *Praxis*® Elementary Education: Curriculum, Instruction and Assessment
- Pass *Praxis*® Principles of Learning and Teaching: Grades K–6
- Pass *Praxis*® Teaching Reading: Elementary

Finance - Graduate Certificate

Admission requirements:

1. Completion of a Bachelors or other advanced degree with a minimum GPA of 3.0.
2. Earned a B or better in the following NMSU courses — or their equivalents — within seven years prior to acceptance into the program:

Prefix	Title	Credits
BFIN 341	Financial Analysis and Markets	3
MATH 1430G	Applications of Calculus I	3
MATH 1350G	Introduction to Statistics	3

or

Undergraduate GPA of at least 3.25 with 2 or more years of experience¹

¹Two or more years of relevant, full-time, post-degree, professional work experience in the finance industry. See Finance Graduate Certificate (<https://business.nmsu.edu/degree-programs/minors/certificates/grad-cert-finance.html>) for more details.

3. Please visit gradschool@nmsu.edu and submit an application online.

Certificate Course Requirements

Courses are offered in a traditional classroom and/or online.

Prefix	Title	Credits
Choose four from the following:		12
BFIN 503	Financial Management	
BFIN 511	Advanced Derivative Markets	
BFIN 521	Personal Financial Planning for Professionals	
BFIN 535	Investment Concepts	
BFIN 545	Fixed Income Markets, Instruments and Derivatives	
BFIN 555	Derivative Markets and Securities	
BFIN 575	International Managerial Finance	
BFIN 581	Management of Financial Institutions	
Total Credits		12

Museum Studies - Graduate Certificate

The Graduate Certificate in Museum Studies provides specialized interdisciplinary training that enables students to pursue careers in museums in the public or private sectors. The curriculum includes museology, methods, exhibit development, collections management, conservation, curation, and practice in Museum Studies. The core requirements for Anth 545 Advanced Museology and Hist 594 Public History Seminar alternate on rotation with controlled electives *every other year*. If you enroll in a year when these courses are not being offered, it will take you at least two years to complete your certificate.

The Certificate may be completed as a stand alone certification or in conjunction with the M.A. degree in Anthropology, History, Art, and related fields.

If you wish to complete a graduate certificate, you must apply (<https://gradschool.nmsu.edu/>) for admission to this non-degree program. Even

if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to apply to be awarded the certificate through your myNMSU account.

Please contact the Anthropology Graduate Advisor (kljenks@nmsu.edu) for information about how to complete the application.

The Certificate in Museum Studies is a 3 semester (or one year and one summer) program designed for individuals who want to enhance their understanding of museum work. It may be completed as a stand alone certification or in conjunction with a Master's degree in Public History, History, Art History, Anthropology, Studio Art or other disciplines.

Prefix	Title	Credits
Core Curriculum		
ANTH 545	Advanced Museology	3
ARTS 503	Preventive Conservation/Collections Care	3
HIST 594	Public History Seminar	3
<i>Internship (credits from ANTH, ART, or HIST)</i>		3
ANTH 597	Internship	
ARTS 490	Museum Conservation Internship	
ARTS 576	Museum/Gallery Research Internship	
HIST 585	Public History Internship	
Controlled Electives		
Select two from the following: ¹		6
ANTH 540	Cultural Resource Management	
ANTH 547	Museum Field Methods	
ANTH 549	Advanced Museum Anthropology	
ANTH 556	Advanced Native American Intersections in Museums	
ANTH 564	Advanced Curation Crisis in Archaeology	
ARTS 501	Museum Conservation Techniques I	
ARTS 502	Museum Conservation Techniques II	
ARTH 546	Museum and Curatorial Studies	
ARTH 579	Graduate Seminar: Art Theory, Criticism, Historiography	
HIST 579	Oral History	
HIST 583	Advanced Historic Preservation	
HIST 586	Interpreting Historic Places for the Public	
Total Credits		18

¹ This list is regularly modified as new courses are added to the catalog, or old ones are phased out. Eligible courses are determined by a committee with at least one representative from Art, Anthropology and History. Substitutions may be approved with the advice of Museum Studies Faculty in Art, History, and Anthropology by the Department Head of Anthropology.

Principal Licensure - Graduate Certificate

Students seeking to complete the Principal Licensure Graduate Certificate program for the purpose of obtaining administrative licensure must already hold an MA or MS and New Mexico Level III teacher licensure. Students must complete the required 24 credit hours of coursework, which includes six credit hours of a university-supervised administrative internship (over the course of two semesters). Students

must earn a final grade of B- or better in all classes. Courses in which a student earns a "C" grade or below will need to be repeated and not count towards graduation. Important information about the Educational Leadership & Administration Programs can be found here (<https://ela.nmsu.edu/>).

Prefix	Title	Credits
Requirements		
All 24-credit hours must be completed to earn the Principal Licensure Graduate Certificate		
ELAD 5110	The Principalship	3
ELAD 5120	Leadership and Administration of Bilingual Education	3
ELAD 5140	Educational Financial Management	3
ELAD 5150	Public School Law	3
ELAD 5170	Special Education Administration	3
ELAD 5180	Internship Public Schools Part I	3
ELAD 5185	Internship: Public Schools Part II	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
Total Credits		24

Students must earn a final grade of "B-" or better in all classes. Courses in which a student earns a "C" grade or below will need to be repeated and not count towards graduation.

All 24-credit hours must be completed to earn the Principal Licensure Graduate Certificate and meet the administrative licensure requirements of the New Mexico Public Education Department.

Important information about the Educational Leadership & Administration Programs can be found here (<https://ela.nmsu.edu/>).

First Year		
Fall		Credits
ELAD 5110	The Principalship	3
ELAD 5140	Educational Financial Management	3
Credits		6
Spring		
ELAD 5180	Internship Public Schools Part I	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
Credits		6
Summer		
ELAD 5170	Special Education Administration	3
ELAD 5120	Leadership and Administration of Bilingual Education	3
Credits		6
Second Year		
Fall		
ELAD 5185	Internship: Public Schools Part II	3
ELAD 5150	Public School Law	3
Credits		6
Total Credits		24

Public Health - Graduate Certificate

The graduate certificate program in public health is not an official graduate degree offered by NMSU but rather a focused collection of courses that enrolled students complete in public health. These courses

are designed to provide and/or enhance students' knowledge of and skills in public health practice. Those students who successfully complete the previously listed courses receive a certificate of completion statement on their official transcript and a formal certificate from the university.

Prefix	Title	Credits
Certificate Program Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
Choose one Health Policy Elective from the following:		3
PHLS 5140	Health Services System: Administration and Organization	
PHLS 5160	Public Health Policy Analysis	
PHLS 5150	Environmental Public Health Issues	3
Elective ¹		3
Total Credits		15

¹ For those who have not had any statistics courses it is strongly recommended that they complete PHLS 5120 Biostatistical Applications in Public Health as their elective.

Note that students who complete the Graduate Certificate are eligible to sit for the Certified Public Health (CPH) examination.

Apply online at <http://gradschool.nmsu.edu> (<http://gradschool.nmsu.edu/>). International students are required to contact the Center for International Programs at (575) 646-5480.

Graduate PH Certificate: 1 Year Plan

First Year		
Fall		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5140	Health Services System: Administration and Organization	3
Credits		6
Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5150	Environmental Public Health Issues	3
Credits		6
Summer		
Elective		3
Credits		3
Total Credits		15

Graduate PH Certificate: One course per semester plan

First Year		
Fall		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
Credits		3

Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
Credits		3
Summer		
Elective		3
Credits		3
Second Year		
Fall		
PHLS 5140	Health Services System: Administration and Organization	3
Credits		3
Spring		
PHLS 5150	Environmental Public Health Issues	3
Credits		3
Total Credits		15

Public Utility Regulation and Economics - Graduate Certificate

The certificate in Public Utility Regulation and Economics (PURE) is a professional educational program designed for post-baccalaureate students pursuing a career in the utility sector, with an electric utility company, natural gas utility, water distribution utility, or with a government agency regulating these types of companies. PURE students must meet the general regulations and minimum requirements for admission to the graduate school and complete 12 credit hours including

Prefix	Title	Credits
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		12

For details see <https://business.nmsu.edu/academic-programs/graduate-programs/graduate-certificates/graduate-certificate.html>

Secondary Education Alternative Licensure - Graduate Certificate

The NMSU Secondary Education Alternative Licensure program aims to recruit highly qualified individuals who have earned *at least* a bachelor's degree in a related field and are eligible for a temporary two-year alternative license in the State of New Mexico. We seek individuals who will have dramatic impact on the social, cultural, emotional, and intellectual growth of youth with whom they will work throughout their career.

Applicants must meet the following minimum requirements and submit the required documentation for consideration:

- Meet minimum state requirements of *at least* a bachelor's degree and course requirements of 30 undergraduate credit hours (6.60.3. 7 NMAC) in the teaching field (12 upper division) with a minimum 2.75 cumulative undergraduate GPA.

- Passing scores for *Praxis*® Core Academic Skills for Educators (Core): <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>)
- Be hired and submit a copy of a current teaching contract from a school district in New Mexico that indicates the candidate is the teacher of record in the teaching field for each year of employment.
- Admission to the School of Teacher Preparation, Administration, and Leadership in the College of Education.
- Admission to the NMSU Graduate School (<https://gradschool.nmsu.edu/>)

Prefix	Title	Credits
Required Courses		
EDUC 5120	Multicultural Education	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5150 or EDUC 5110	Classroom Management Exploration in Education	3
Choose one from the following (based on content area):		3
EDUC 5410	Teaching Science at the Middle and High School Level	
EDUC 5420	Teaching Mathematics at the Middle and High School Level	
EDUC 5430	Teaching Social Studies at the Middle and High School Level	
EDUC 5440	Teaching Language Arts at the Middle and High School Level	
READ 5330	Content Area Literacy	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
Total Credits		18

All licensure courses are eligible for transfer into a regular TPAL master's program.

Other Program Requirements to be completed by the end of the two-year program:

- Complete and maintain a 3.0 minimum GPA in all courses throughout the program
- Complete two full consecutive semesters of observation by a University Supervisor with a fee for each semester
- Pass *Praxis*® Content Assessment (choose from list)
- Pass *Praxis*® Principles of Learning and Teaching: Grades 7-12

Special Education Alternative Licensure - Graduate Certificate

The NMSU Special Education Alternative Licensure Certificate aims to recruit highly qualified individuals who have earned at least a bachelor's degree in a related field and are eligible for a temporary two-year alternative license in the State of New Mexico. We seek individuals who will have dramatic impact on the social, cultural, emotional, and intellectual growth of youth with whom they will work throughout their career.

Applicants must meet the following minimum requirements and submit the required documentation for consideration:

Meet minimum state requirements of *at least* a bachelor's degree and course requirements of 30 undergraduate credit hours (6.60.3.7 NMAC) in the teaching field with a minimum 2.75 cumulative undergraduate GPA.

- Passing scores for the *Praxis*® Core Academic Skills for Educators (Core): <https://www.ets.org/praxis/nm> (<https://www.ets.org/praxis/nm/>)
- Be hired and submit a copy of a current teaching contract from a school district in New Mexico that indicates the candidate is the teacher of record in a special education classroom for each year of employment.
- Admission to the School of Teacher Preparation, Administration, and Leadership in the College of Education.
- Admission to the NMSU Graduate School (<https://gradschool.nmsu.edu/>)

Prefix	Title	Credits
Required Courses		
SPED 5105	Introduction to Special Education in a Diverse Society	3
SPED 5110	Low Incidence Disabilities in a Diverse Society	3
SPED 5120	High Incidence Disabilities in a Diverse Society	3
SPED 5130	Reading for Elementary Exceptional Learners in a Diverse Society, K-6	3
SPED 5140	Reading for Secondary Exceptional Learners in a Diverse Society, 7-12	3
SPED 5210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 5220	Classroom Management for Diverse Learners	3
Total Credits		21

All licensure courses are eligible for transfer into a regular TPAL master's program.

Other Program Requirements

- Complete and maintain a 3.0 minimum GPA in all courses throughout the program
- Pass *Praxis*® Special Education: Core Knowledge and Applications
- Pass *Praxis*® Principles of Learning and Teaching: Grades K-6 or Principles of Learning and Teaching: Grades 7-12
- Participate in two complete semesters of observation by a University Supervisor with a fee for each semester.

Sustainability - Graduate Certificate

The Sustainability Graduate Certificate is open to students admitted to the Graduate School who have a GPA of 3.0 or higher. Completion of the certificate requires completion of each of the individual courses with a B or better.

A minimum of 12 credits are required for the certificate. At least 6 credits are from 500-level and above.

Prefix	Title	Credits
The following courses are required and are expected to be taken in sequence:		
ENVS 451	Special Topics (Special Topics in Sustainability)	3
RGSC 575	Climate Studies, Water and Society	3
ENVS 605	Arid Land Water Resources	3

Electives (choose two from the following):¹

AEEC 575	Economics of Water Resource Management and Policy
AGRO 483	Advanced Sustainable Crop Production
ECON 571	Regulatory Policy and Industry Analysis: Electricity I
ENVS 460	Introduction to Air Pollution
ENVS 462	Sampling and Analysis of Environmental Contaminants
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation
GEOG 535	Planning a Sustainable World
GEOG 555	Southwest Environments
SOCI 4335V	Advanced Environmental Sociology
SOCI 5310	Seminar in Community Development
WSAM 590	System Dynamics

Total Credits**15**

¹ Other potential courses may be available in the catalog. Discuss with your Sustainability Advisor whether the course would be suitable. Substitutions and exceptions can be made with the approval of the Sustainability faculty advisor and Department Head of Plant & Environmental Sciences Department.

Systems Engineering - Graduate Certificate

Program Availability

This distance education program is available to working professionals who have undergraduate degrees in engineering, engineering technology, and related fields. It is also an option for persons with graduate degrees who seek career renewal. Systems engineering provides a unique opportunity for working professionals to integrate their work experience with advanced coursework.

Program Objectives

The objectives of this program are:

- To provide technical professionals an opportunity to advance their careers through advanced education in systems engineering.
- To develop and improve relationships with the College of Engineering's constituencies by offering a program that addresses a known need for professional graduate-level development.
- To provide an opportunity for non-traditional students to consider advancing their education in areas that will foster their career development.
- To enable program students to become aware of current faculty research in systems engineering areas.

Requirements

A 3.0 minimum cumulative GPA in four courses as described below will be required for award of the Systems Engineering Graduate Certificate Program.

Admission to the NMSU Graduate School

Students must apply and be admitted to NMSU as a non-degree student to take classes. For more information, contact:

NMSU Graduate School

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Box 30001, MSC 3G

Las Cruces, NM 88003

(575) 646-2736

<http://gradschool.nmsu.edu/> (<http://gradschool.nmsu.edu/>)

To complete the Certificate Program, students must be admitted to the Graduate School as certificate students. If you are considering pursuing a degree in electrical or industrial engineering, you should contact that department for admissions requirements and advising.

Academic Content

Prefix	Title	Credits
Required Courses		6
I E 537	Large Scale Systems Engineering	
I E 590	Selected Topics (Systems Engineering)	
Electives (six credits from the following):		6

Track 1 - Modeling, Simulation & Decisions

I E 490	Selected Topics
I E 533	Linear Programming
I E 535	Discrete Optimization
I E 545	Characterizing Time-Dependent Engineering Data
I E 567	Design and Implementation of Discrete-Event Simulation

Track 2 - Applications

E E 460	Space System Mission Design and Analysis
I E 525	Systems Synthesis and Design
E E 585	Telemetry Systems
E E 590	Selected Topics

Track 3 - Systems Analysis

I E 466	Reliability
I E 515	Stochastic Processes Modeling
I E 522	Queueing Systems
I E 571	Advanced Quality Control

Total Credits**12**

Other courses may be substituted by the approval of your advisor and the program director.

Telemetry - Graduate Certificate

Telemetry is an applied discipline that uses concepts from communications, DSP, and computing to facilitate the transfer of sensed/measured data from one place to another over a typically wireless channel. This certificate introduces students to the basic theory as well as the application of that theory.

A 3.0 minimum cumulative GPA in four courses (12 credits) as described below will be required for award of this certificate. Dr. Charles Creusere, Frank Carden Chair in Telecommunications and Telemetry and Professor of the Klipsch School of Electrical & Computer Engineering, (575) 646-3919.

Prefix	Title	Credits
Required Courses		6
E E 545	Digital Signal Processing II	
E E 585	Telemetry Systems	
Electives (six credits from the following):		6
E E 571	Random Signal Analysis	

E E 572	Modern Coding Theory	
E E 581	Digital Communication Systems I	
E E 583	Wireless Communications	
Total Credits		12

Advanced Manufacturing - Graduate Minor

The Advanced Manufacturing graduate minor is restricted to students currently enrolled in any of the Master of Engineering programs.

Prefix	Title	Credits
Required Courses		
C E 510	Introduction to Nondestructive Testing	3
CHME 491	Undergraduate Special Topics (Development of Agricultural Technologies)	3
I E 490	Selected Topics (Introduction to Advanced Manufacturing)	3
500 Level Approved Department Course List		3
Total Credits		12
First Year		
Fall		
I E 590	Selected Topics	3
500 level Course (approved from the Department Course List)		
Credits		3
Spring		
C E 510	Introduction to Nondestructive Testing	3
CHME 491	Undergraduate Special Topics (Development of Agricultural Technologies)	3
Credits		6
Total Credits		9

Agricultural and Extension Education - Graduate Minor

A graduate student who wishes to minor in AXED, while majoring in another academic program, should select an advisor from the AXED Graduate Faculty. A student minoring in AXED must complete at least nine credit hours of approved courses in the AXED department. A copy of the minor program must be approved by the AXED department head. Contact an advisor in AXED.

Animal Science - Graduate Minor

A minimum of 9 credit hours in graduate level classes with the ANSC prefix are required to obtain a graduate minor in Animal Science. Approval by the Animal and Range Sciences Department Head is required.

Anthropology - Graduate Minor

For the minor in anthropology, students are required to complete at least 9 credits (3 courses) of graduate-level anthropology coursework at the level of 500 or above. A minor in anthropology provides a useful concentration for students developing professional careers in teaching, environmental sciences, international business, community development, social work, art, and historic preservation. We recommend

that students consult the anthropology graduate advisor and focus their coursework in the appropriate subfield.

To include a minor on a student's transcript, the minor must be listed on the NMSU Graduate Program of Study, and this form must be signed by the anthropology graduate advisor. Graduate students majoring in anthropology may **not** also earn a minor in the same field.

Applied Statistics - Graduate Minor

The minor in applied statistics is designed for graduate students majoring in other fields. It provides credentials that the student is capable of conducting statistical analyses in their area of specialization.

Master's level students wishing to minor in applied statistics at the master's level must have at least 10 credits of 500-level applied statistics courses. In accordance with Graduate School requirements, doctoral students must have at least 12 credits of 500-level applied statistics courses for a minor.

Students who wish to focus on experimental statistics typically complete A ST 503 SAS Basics, A ST 504 Statistical Software Applications, A ST 505 Statistical Inference I, A ST 506 Statistical Inference II. A typical course sequence for students interested in data analytics consists of A ST 505 Statistical Inference I, A ST 507 Advanced Regression, A ST 515 Statistical Analysis with R, and A ST 540 Predictive Analytics.

Students wishing to obtain the minor in applied statistics should contact an applied statistics faculty member to recommend appropriate applied statistics course work to be included in the plan of study and to serve as the graduate committee representative from the minor area.

Archaeology - Graduate Minor

The graduate minor in archaeology allows students in other programs to develop a specialization in archaeology. A minor in archaeology provides a useful concentration for students developing professional careers in cultural resource management, public lands management, environmental sciences, public history, geography, or teaching.

In order to complete the minor requirements, students are required to complete 9 credit hours (3 classes) of graduate level courses. The core courses for the minor are:

Prefix	Title	Credits
Course Requirements		
Select 9 credits from the following:		9
ANTH 514	Advanced Issues in the Archaeology of Religion	
ANTH 516	Advanced Archaeology of the American Southwest	
ANTH 518	Advanced Historical Archaeology	
ANTH 522	Archaeological Field School-Graduates	
ANTH 523	Archaeological Mapping	
ANTH 540	Cultural Resource Management	
ANTH 564	Advanced Curation Crisis in Archaeology	
ANTH 542	Cultural Resource Management II	
ANTH 575	Advanced Pottery Analysis in Archaeology	
ANTH 576	Lithic Technology Organization	
ANTH 577	Advanced Zooarchaeology	

ANTH 578 Advanced Lab Methods in Archaeology

Total Credits

9

Students should choose among these core offerings with the advice of their MA thesis chair and minor area committee member. The minor in archaeology is not available to graduate anthropology majors. Substitutions for special topics courses available by permission of Anthropology Department Head.

Bioinformatics (with Computer Science) - Graduate Minor

The Bioinformatics minor is jointly offered with the Department of Computer Science and consists of 9 credit hours for Master's students and 12 credit hours for Ph.D. students, including BIOL 550 Special Topics/GENE 452 Applied Bioinformatics, and additional courses selected from those listed at <http://research.nmsu.edu/molbio/> (<https://molb.nmsu.edu/curriculum/under-graduate-minor-in-bioinformatics.html>). The courses selected will depend on whether the student is majoring in a biological or non-biological science and include courses from the graduate Computer Science and Molecular Biology curricula. Please inquire with the Molecular Biology Program office for the most recent requirements for the bioinformatics minor.

Communication Studies - Graduate Minor

Students who wish to take a minor in Communication Studies will need to accumulate a minimum of 9 graduate credits in Communication Studies courses. Students are encouraged to contact the Communication Studies Department Head for direction in the selection of courses.

Computer Science - Graduate Minor

Students who wish to take a minor in Computer Science will need to accumulate a minimum of 9 graduate credits not including the C S 460 Computer Science I Transition Computer Science course. Students are encouraged to contact the Computer Science Graduate Committee Chair for directions in the selection of courses.

Economics - Graduate Minor

The graduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro- economic forces influence individuals, business and government decision making. Students interested in public utility regulation, banking and finance, government service, or law will find the minor especially interesting.

Graduate students wishing to earn a minor in economics must complete 12 semester credit hours, including:

Prefix	Title	Credits
Select at least two from the following:		
AEEC 501	Microeconomic Theory	3
AEEC 502	Macroeconomic Theory	3
AEEC 540	Econometrics I	3
ECON or AEEC 500 or higher courses (excluding ECON 503) ¹		6
Total Credits		12

¹ ECON 503 Managerial Economics cannot be counted toward the minor.

Students pursuing the economics minor must fulfill the course prerequisites before enrolling in the graduate courses.

Educational Administration (Doctoral) - Graduate Minor

Doctoral Graduate Minor

Doctoral students who wish to earn a minor in Educational Leadership and Administration should meet with an ELA faculty member to discuss program and/or courses. NOTE: Faculty will prescribe a plan of study for the minor that takes into consideration the career aspirations and goals of the student.

Students must earn a minimum of a "B" grade in all minor coursework.

Students who receive a grade of "B-" or below will be required to retake the course.

Educational Administration (Higher Ed.) - Graduate Minor

Master's students may earn a minor in educational administration, with a focus in Higher Education Administration, by passing **three** of the listed classes below.

How to Apply

Students wishing to obtain the minor should contact ELA Doctoral Programs Coordinator at edmandev@nmsu.edu.

Minimum Grade Requirement

Students must earn a minimum "B-" grade in all required coursework.

Students who receive a grade of "C+" or below will be required to retake the course.

Prefix	Title	Credits
ELAD 5215	Higher Education Administration	3
or ELAD 5210	Community College Administration	
ELAD 5250	Higher Education Law	3
ELAD 5230	Higher Education Finance and Funding	3
ELAD 5240	Management of Student Services in Higher Education	3
Total Credits		12

Educational Administration (Pk-12) - Graduate Minor

Master's level students wishing to earn a minor in educational administration, with a focus in Pk-12 Educational Administration, must pass **three** of the listed classes below.

How to Apply

Students wishing to obtain the minor should contact ELA Doctoral Programs Coordinator at edmandev@nmsu.edu.

Minimum Grade Requirement

Students must earn a minimum "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course.

Prefix	Title	Credits
ELAD 5110	The Principalship	3
ELAD 5140	Educational Financial Management	3
ELAD 5150	Public School Law	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
Total Credits		12

Fish, Wildlife and Conservation Ecology - Graduate Minor

A minor in Fish, Wildlife, and Conservation Ecology requires 9 credits of graduate coursework that carries the FWCE prefix. Official minor documentation must be completed with the Department of Fish, Wildlife and Conservation Ecology. Students wishing to obtain to obtain a graduate minor in Fish, Wildlife and Conservation Ecology (FWCE) must: 1) obtain approval from the Department Head of the Department of Fish, Wildlife and Conservation Ecology Department Head; 2) have a FWCE faculty member as part of their graduate advisory committee; FWCE faculty member needs to approve the proposed program of study for the minor; 3) complete a minimum of 9 credit hours in graduate level (500) classes with the FWCE prefix. FWCE 509 Population Ecology (s) (3 s.h.) is required, plus an additional 6 credit hours.

Prefix	Title	Credits
The graduate minor in FWCE would require nine credit hours in FWCE graduate-level courses and would include the following:		
Required course		3
FWCE 509	Population Ecology (s)	
Required elective (at least 3-4 credits from one of the following)		3-4
FWCE 459	Aquatic Ecology	
FWCE 547	Wildlife Law and Policy	
Elective		
Three credits from any of the remaining graduate courses in Wildlife Science		3
Total Credits		9-10

Food Studies - Graduate Minor

The purpose of the Food Studies Graduate Minor is to:

- 1. Enable students to develop a specialization in food studies within their respective graduate program
- 2. Develop specialized knowledge of the complex and dynamic relationship between food and culture
- 3. Explore the role of culture in food production, distribution and consumption across different cultures
- 4. Apply ideas and knowledge from graduate seminars to fieldwork for MA thesis or internship in a food studies topic

Program Requirements

Prefix	Title	Credits
Core Curriculum		
Select three from the following: ¹		9

ANTH 520	Ethnographic Field Methods	
ANTH 531	Issues in Nutritional Anthropology	
ANTH 538	Plants, Culture, and Sustainable Development	
ANTH 539	Culture and Foodways	
ANTH 515	Applied Anthropology ²	
ANTH 535	Adv. Human Health and Biological Variation ²	
Total Credits		9

¹ Alternative classes may be substituted for one of the core classes with the approval of the Anthropology Department Head.
² In these cases, the student's class research project should focus on a food studies theme.

Students are expected to conduct a food studies thesis, applying anthropological theoretical frameworks and ethnographic methodologies to the study of a food-related topic. Non-thesis students may select a food studies internship. Possible topics include sustainable development, alternative food movements, community food security, community health, nutrition, food safety, globalization of food, indigenous knowledge systems, food self-sufficiency, among others.

Gender and Sexuality Studies - Graduate Minor

The graduate minor in Gender and Sexuality Studies specializes in the examination of gender; gender identity; queer and transgender studies; feminisms; and social justice from interdisciplinary perspectives. Students develop a strong understanding of how interconnected social formations such as race, class, age, nation, citizenship, ability, and other categories of difference are constructed and intersect with gender and sexuality. The graduate minor in Gender and Sexuality Studies offers students a documented emphasis in their academic training in the field of Gender and Sexuality Studies. The graduate minor allows students to acquire specialized knowledge through the interdisciplinary curriculum offered by Gender and Sexuality Studies and to integrate theoretical perspectives and methodologies from Gender and Sexuality Studies into diverse academic fields. Our courses equip students with analytical skills and knowledge to engage power structures critically and transform lives and communities.

We offer a plan of study that integrates humanities and social sciences methods and objects of study, including areas of concentration such as human rights and transnational migration; socially engaged literature, film, and other creative media; and transnational and decolonial methodologies. The graduate minor in Gender and Sexuality Studies complements many advanced degree programs at NMSU including Anthropology, Art, Biology, Business Administration, Chemistry, Clinical and Mental Health Counseling, Communication Studies, Creative Writing, Criminal Justice, Curriculum and Instruction, Economics, Education, English, Government, History, Psychology, Public Health Sciences, Social Work, Sociology, Spanish, and others.

Gender and Sexuality Studies students prepare for careers in such fields as advocacy and social organizing, community development, creative writing, criminal justice, education, filmmaking and video production, health care, human resources, journalism, law, music production, social services, and visual arts. Many students declare a graduate minor in Gender and Sexuality Studies to enhance career opportunities and learning.

Courses are offered both online and on campus. In addition to the graduate minor, Gender and Sexuality Studies offers a B.A. and undergraduate minor.

Master's and Doctoral minor candidates:

Prefix	Title	Credits
Required Core Course		
GNDR 571	Advanced Seminar in Feminist and Queer Theories	3

For a Master's Degree minor candidate:

6 additional credit hours from upper level Gender & Sexuality Studies courses or courses cross-listed with Women's Studies and other departments/programs are required. (9 credit hours total)

For a Doctoral Degree minor candidate:

9 additional credit hours from upper level Gender & Sexuality Studies courses or courses cross-listed with Women's Studies and other departments/programs are required. (12 credit hours total)

Geographic Information Systems - Graduate Minor

The Department of Geography offers a minor in Geographic Information Systems, and this minor is available for all graduate students. To earn a minor in GIS, the following courses are required, combining for a total of 14 credits. Students may not take any of these courses S/U, and students must earn a grade of at least B- in all of these classes.

Prefix	Title	Credits
Requirements		
GEOG 573	Introduction to Remote Sensing	4
GEOG 578	Fundamentals of Geographic Information Science (GIS)	4
Select 6 credits from the following:		6
GEOG 571	Cartography and Geographic Information Systems	
GEOG 572	Geodatabase Design	
GEOG 581	System Design for Geographic Information Science (GIS)	
GEOG 582	Advanced Remote Sensing	
GEOG 588	GIS and Water Resources	
GEOG 598	Selected Topics	
Total Credits		14

Gerontology - Graduate Minor

A grade of B or higher is required in all coursework for the Graduate Minor in Gerontology.

Prefix	Title	Credits
Required Courses		
Select four courses from the list below (12 credits)		12
PHLS 4740	Aging and Public Policy	
PHLS 5650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 5710	Introduction to Gerontology	
PHLS 5720	Health Promotion for the Older Adult	
PHLS 5730	Adulthood and Aging	

PHLS 5996	Special Topics (Aging in a Multicultural Society)	
Total Credits		12

History - Graduate Minor

Students may earn a graduate minor in History by passing the following courses:

Prefix	Title	Credits
Craft of History		
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 593	Reading Seminar: History, Myth and Memory	
Select two additional 3-credit 500-level and above courses		6
Total Credits		12

Graduate students in History must maintain a 3.0 grade point average in their History courses. A graduate student earning a C or lower grade in one History course will receive a letter of warning. A graduate student earning two or more C or lower grades in History courses or whose History grade point average falls below 3.0 will be removed from the History graduate program. Students must earn at least one B or higher grade in a seminar during their first year in the graduate program, and must take at least one seminar during each year in which they are enrolled in the program. If a graduate student receives one U (Unsatisfactory) grade on his/her thesis or internship, the student will receive a written warning, and if a student received two or more U grades on his/her thesis or internship, the student will be removed from the program.

Information Systems - Graduate Minor

This minor is for master's-level students who are not in the Masters of Business Administration (MBA) program. Students in the MBA program may choose a concentration in Information Systems (see the Business Administration (p. 856) section).

To obtain a graduate minor in Information Systems (IS) students must satisfy the requirements as stated below for a minor at the master's level. For it to appear on the transcript, the student must list the minor on the Program of Study and Committee for Master's Student (Application for Admission to Candidacy) and have it signed by the head of the department offering the minor.

Requirements

The minor requires a minimum of 9 credits of graduate work.

Prefix	Title	Credits
Requirements		
BCIS 550	Information Systems Analysis and Design	3
BCIS 575	Database Management Systems	3
Select 3 credits from the following:		3
BCIS 561	Business Analytics I	
BCIS 566	Business Analytics II	

BCIS 580	E-Commerce Security
BCIS 582	Management of Information Security
BCIS 585	Enterprise Resource Planning & Business Processes
BCIS 590	Special Topics
Total Credits	

Integrated Behavioral Health Care - Graduate Minor

The Minor in Integrated Behavioral Health Care, offered through the Counseling and Educational Psychology (CEP) department, is open to graduate students enrolled in CEP programs Clinical Mental Health Counseling, School Psychology, Counseling Psychology and to graduate students who are enrolled in Social Work, Public Health, Nursing and Marriage and Family Therapy programs.

It was established in the interest of meeting the needs of graduate students in the health professions who are receiving, or seeking training in, interdisciplinary or interprofessional collaborations with other healthcare disciplines. The provision of integrated behavioral health services fits within the university's broader goal of meeting the needs of the citizens of New Mexico and the department's commitment to graduating competent service providers who can be effective members of a health care team.

Students will successfully complete 9 credits of coursework specific to this program of study in order to obtain a Minor in Integrated Behavioral Health Care. For application and coursework details, please contact the CEP department office or visit the departmental website at <https://cep.nmsu.edu>.

Through the courses in this minor students develop knowledge and skills in the following areas:

1. Apply the biopsychosocial model of health and illness with primary care patients,
2. Apply knowledge regarding the mind-body connection to address such issues as stress management, emotion regulation and sleep medicine,
3. Apply culturally responsive behavioral assessment/interventions,
4. Demonstrate behavioral health consultation skills with other health care providers, and
5. Develop interprofessional collaboration skills that include understanding the roles of all healthcare professionals and learning how to communicate effectively in order to engage in service delivery as a team.

Prerequisites

In order to begin the Minor courses, students **must currently be enrolled in a Behavioral Health program**. There are no other prerequisites.

How to Apply

If you are interested in pursuing a minor in Integrated Behavioral Healthcare, you should complete the attached application and return it to the IBH Minor coordinator, Eve Adams (eadams@nmsu.edu). It is best to meet with the program coordinator before enrolling in relevant coursework, but it is possible to obtain the minor after taking one of the courses in the program of study. The application form allows the CEP department to keep track of potential minors in order to determine

what courses need to be offered at any given time. To declare the Minor with the Graduate School, the student should list all relevant completed coursework on the Program of Study form that is submitted to the Graduate School prior to graduating. This form must be signed by Dr. Adams. A IBH Minor faculty member is also required to sit on the student's graduate committees, including the comprehensive exam and the dissertation proposal and defense exams.

Application: Integrated Behavioral Healthcare Minor Form and Description (<https://cep.nmsu.edu/academic-programs/Integrated-Behavioral-Healthcare-Minor-form-description.docx>)

Program of Study

Students will successfully complete 9 credits of work from the courses listed below in order to obtain a Minor in Integrated Behavioral Health Care.

Prefix	Title	Credits
Core Courses		
Choose 9 credits from the following:		9
CEPY 5150	The Art & Science of Mindfulness for Helping Professionals	
CEPY 5280	Primary Care Psychology	
CEPY 5997	Special Research Programs	
or CEPY 6996	Selected Topics	
CEPY 6590	Behavioral Health Practicum	
Total Credits		9

CEPY 5150 The Art & Science of Mindfulness for Helping Professionals (1-3 s.h.) In this course, students learn about contemplative practices by learning about and participating in various mindfulness practices. This course engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning. The students learn how to increase well-being through mind-body integration, and they learn how to teach others mindfulness techniques. Students are required to explore the research on mindfulness for some medical condition or for its use with a specific population. This course has been taught in the spring semester, for five years, to CEP, MSW, MPH, and FCS students.

CEPY 5280 Primary Care Psychology (3 s.h.) Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Activities include 1) guest speakers on American Indian Health, the Mexican Healthcare System, and Integrated Care in primary care settings; 2) visits to 2 interdisciplinary, integrative, border community health centers; 3) shadowing residents at the Family Medicine Center and observing the integration of psychological and medical aspects of the cases observed; and 4) exposure to the interventions of Motivational Interviewing and Mindfulness-Based Stress Reduction. CEP, MSW, and MPH trainees have enrolled in this course, taught during the fall semester, over the last 11 years.

CEPY 5997 Special Research Programs (1-6 s.h.)/CEPY 6996 Selected Topics (1-6 s.h.) This course will require students to spend a minimum of 6 hours per week at a primary care site, providing counseling, assessment, supervision, or psychoeducational services. The Minor coordinator must approve all placements. CEP students have enrolled in this course over the last 4 years. This course is available fall, spring and summer. During the summer, a special section of this course is

subtitled, "Interprofessional Immersion" as CEP, DNP, and Family Medicine and PharmD residents learn interprofessional competencies related to providing geriatric care. This special section has been offered for two summers.

CEPY 6590 Behavioral Health Practicum (1-6 s.h.). An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. This course will provide students the opportunity to participate in a supervised service-learning experience within community-based, interdisciplinary, primary care settings that serve medically underserved and high-risk groups. Students write and present a case study utilizing the biopsychosocial model of health. MSW and CEP students are placed in community-based organizations with Family Medicine residents or other medical personnel in order to provide integrated care. This course has been offered in the spring semester for the last 11 years.

Materials Engineering - Graduate Minor

The Materials Engineering minor at New Mexico State University is part of a materials education program that addresses the growing demand for engineers and scientists with understanding of the wide range of materials, their properties and means of characterization. A student must pass 18 credits of courses with a grade C or better. The minor includes one required course (CHME 361 Engineering Materials), and the balance elective courses chosen from menus available on the Chemical and Materials Engineering website (<http://chme.nmsu.edu/academics/minors/materials-engineering/> (<https://chme.nmsu.edu/academics/minors/materials-engineering/>)). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 361	Engineering Materials	3
Electives		15
Total Credits		18

Molecular Biology - Graduate Minor

The Molecular Biology Minor consists of 10 credit hours including MOLB 545; either MOLB 520 or MOLB 542; any of the tier II courses; and one MOLB 590 seminar.

Prefix	Title	Credits
Required Courses		
MOLB 545	Molecular and Biochemical Genetics	3
MOLB 520	Molecular Cell Biology	3
or MOLB 542	Biochemistry I	
MOLB 590	Discussions in Molecular Biology	1
Molecular Biology Tier II Courses		
Select one from the following:		3
AGRO 516	Molecular Analysis of Complex Traits	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 602 L	Molecular Techniques in Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	
BCHE 546	Biochemistry II	
BCHE 647	Physical Biochemistry	

BIOL 451	Physiology of Microorganisms
BIOL 470	Developmental Biology
BIOL 474	Immunology
BIOL 475	Virology
BIOL 477	Applied and Environmental Microbiology
BIOL 478	Molecular Biology of Microorganisms
BIOL 490	Neurobiology
BIOL 541	Professional Development Seminar
BIOL 550	Special Topics
BIOL 577	Advanced Topics in Environmental Microbiology
BIOL 590	Neuroscience
BIOL 698	Selected Topics
CHEM 516	Physical Organic Chemistry
EPWS 486	Plant Virology
MOLB 546	Biochemistry II
MOLB 650	Advanced Topics in Molecular Biology
TOX 461	Toxicology I
GENE 486	Genes and Genomes

Total Credits

10

Native American Studies - Graduate Minor

The purpose of the Native American Studies Graduate Minor are to:

- Provide an opportunity for all students to learn about Native American cultures and societies.
- Facilitate research and other creative activities that concern Native American peoples and that have potential benefit for them.
- Serve the University and State of New Mexico in ways that support and illuminate the rich heritage of Native American peoples.

The Graduate minor in Native American Studies focuses on Native American cultures and societies, deals with contemporary and historical experiences of American Indians, and examines the contributions of Indigenous peoples to life in the United States and other American nations. This specialization has developed in reaction to Western academic views of Native Americans and to the frequently restrictive, assimilationist approach within universities to issues concerning Native peoples. NAS contributes to a new understanding of Native American cultures and societies from contemporary and historical perspectives.

To qualify for a graduate minor in Native American Studies, students are required to complete 9 credit hours of graduate level courses. To record a minor on a student's transcript, the minor must be listed on the Graduate School's Program of Study form, and the Native American Studies advisor in the Department of Interdisciplinary Studies must sign this form.

Prefix	Title	Credits
Core Courses: Choose nine credit hours from the courses on the list		
ANTH 541	Advanced Indigenizing Methodologies in Native American Studies	
or BEST 511	Methodologies in Borderlands and Ethnic Studies	
ANTH 543	Theories in Borderlands and Ethnic Studies	
ANTH 544	Native American Visual Culture	
NATV 4220	Federal Indian Policy	
NATV 5120	Advanced Indigenous Peoples History of the United States	

NATV 5210	Advanced Native American Education	
ANTH 553	Native American Women	
ANTH 556	Advanced Native American Intersections in Museums	
PHLS 5996	Special Topics (American Indian Health)	
POLS 536	Public Policy and Indigenous Communities	
Total Credits		9

¹ Alternative classes may be substituted with the approval of the student's MA chair and the Director for the Graduate Minor in Native American Studies, Dr. Georgina Badoni (gbadoni@nmsu.edu).

Physics - Graduate Minor

Eligibility

This minor is available to graduate students not majoring in Physics or Geophysics.

Requirements

A student must satisfy the following requirements to earn a graduate minor in Physics:

- Successfully complete 12 credit hours of courses in Physics or Geophysics numbered above 500. Of these, not more than 3 credit hours can be for research, independent study, or other informal courses.
- Pass one of the four sections of the Physics Department's Qualifying Exam at the Ph.D. level.
- A member of the Physics faculty must be a member of the student's graduate committee.

Psychology - Graduate Minor

Any master's or doctoral student can declare a minor in Psychology in addition to their major area of study.

Students may earn a minor in psychology at the M.A. or Ph.D. level by completing nine credits of any 500-level and above coursework in psychology EXCEPT the following courses (PSYC 507, PSYC 508, PSYC 509, PSYC 590, PSYC 598, PSYC 599, PSYC 600, or PSYC 700).

All minors must be approved by the minor department head and dean of the Graduate School. Students must declare the Psychology minor on a Program of Study and Committee Form for the Master's and doctoral level. Demonstration of competency in the minor area will be required at both comprehensive and final examinations. Students must also include a representative from the Psychology department on their thesis, comprehensive, and/or dissertation committees. The representative from the minor department can also serve as the Dean's Representative on the committee.

Range Science - Graduate Minor

A minimum of 9 credit hours in graduate level classes with the RGSC prefix are required to obtain a graduate minor in Range Science. Approval by the Animal and Range Sciences Department head is required.

Security Studies - Graduate Minor

Additional Courses

Other graduate courses may become available during the year which may be substituted for the above listed courses. Consideration may be made on a case-by-case basis.

Prefix	Title	Credits
Requirements		
Select three from the following:		9
POLS 468	Rebels, Guerrillas, and Terrorists in Modern Latin America	
POLS 549	Ethics in Government	
POLS 560	Seminar in International Relations Theory	
POLS 564	Advanced National Security Policy	
POLS 569	Advanced Issues in Globalization	
POLS 574	Contemporary Comparative Studies	
POLS 596	International Law	
Total Credits		9

Sociology - Graduate Minor

The Department of Sociology offers a Graduate Minor in Sociology to graduate students in other departments on campus at NMSU. For the minor in Sociology, students are required to complete 9 credits (3 courses) of graduate-level Sociology coursework. One course must be a core graduate Sociology course (SOCI 5153 Seminar in Sociological Research, SOCI 5157 Seminar in Qualitative Research Methods, SOCI 5163 Issues in Advanced Quantitative Analysis, and SOCI 5165 Foundations of Social Theory), and the remaining two courses must be elective Sociology courses. An elective Sociology course is any other non-core SOCI 5000+ course except for: SOCI 5110 Perspectives on Sociology, SOCI 5998 Internship and SOCI 5999 Master's Thesis.

Prefix	Title	Credits
Complete one course (3 credits) from the following:		3
SOCI 5153	Seminar in Sociological Research	
SOCI 5157	Seminar in Qualitative Research Methods	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SOCI 5165	Foundations of Social Theory	
Complete two courses (6 credits) from any other SOCI 5000+ courses with the exception of SOCI 5110, 5998, 5999.		6
Total Credits		9

Spanish Counseling - Graduate Minor

The Minor in Spanish Counseling, offered through the Counseling and Educational Psychology department is open to graduate students who are enrolled in CEP's Counseling, School Psychology, and Counseling Psychology programs, and to graduate students who are enrolled in Social Work and Marriage and Family Therapy programs. It was established in the interest of meeting the needs of bilingual counseling students who seek training in the provision of Spanish language mental health services.

In order to begin the Minor courses, students **must currently be enrolled in a Mental Health program** as described above. They must **demonstrate intermediate level Spanish language skills** as evidenced by the Spanish Placement Exam and an oral interview with the program coordinator. Advanced level in Spanish counseling skills is required for the completion

of the Minor. If a student feels that he/she needs to improve his/her level of academic Spanish prior to completing the required course work, or if the program coordinator determines that it is necessary, the student has the option of taking additional Spanish courses through the Languages and Linguistics department. Students will be required to take Spanish language courses until they have satisfied this requirement. Please note that online courses will not fulfill this requirement.

Prerequisites

In order to begin the Minor courses, students **must currently be enrolled in a Mental Health program** as described above. They must **demonstrate intermediate level Spanish language skills** as evidenced by the Spanish Placement Exam and an oral interview with the program coordinator. Advanced level in Spanish counseling skills is required for the completion of the Minor. If a student feels that he/she needs to improve his/her level of academic Spanish prior to completing the required course work, or if the program coordinator determines that it is necessary, the student has the option of taking additional Spanish courses through the Languages and Linguistics department. Students will be required to take Spanish language courses until they have satisfied this requirement. Please note that online courses will not fulfill this requirement.

How to Apply

If you are interested in pursuing a minor in Spanish Counseling and, you should complete the attached application and return it to the program coordinator. You are advised to meet with the program coordinator before enrolling in relevant coursework. This form apprizes the CEP department of your intention to pursue the Minor. To declare the Minor with the Graduate School, the student should list all relevant completed coursework on the Program of Study form that is submitted to the Graduate School prior to graduating. The form needs to be signed by the student's Academic Advisor, Dept. Head, Minor Faculty and Academic College Dean before submitting to the Graduate School. A Minor Faculty member is also required to sit on the committee for the student's Final Exam. For Doctoral students, this includes orals, dissertation proposal and defense exams.

Application: Spanish Counseling Minor Application Form (<https://cep.nmsu.edu/academic-programs/Spanish-Counseling-Minor-Application-Form.pdf>)

Program of Study

Students will successfully complete 9 credits of coursework specific to this program of study in order to obtain a Minor in Spanish Counseling. Courses will be taught by culturally competent faculty, adjunct professors, or community mental health professionals in the aforementioned disciplines. Students will choose one course from each of the following components: 1) Counseling language development, 2) Clinical experience, and 3) Sociocultural experiences.

Prefix	Title	Credits
Course Requirements		
<i>Counseling Language Development (Component #1)</i>		
Choose one from the following:		3
CEPY 6220	Spanish for Mental Health Professionals	
CEPY 5230	Counseling Theory and Technique	
<i>Clinical Experience (Component #2)</i>		
Choose one from the following:		3
CEPY 5997	Special Research Programs	
or CEPY 6996	Selected Topics	

CEPY 6590	Behavioral Health Practicum	
SOWK 5996	Special Topics	
FCST 525	Supervised Clinical Practice	
<i>Sociocultural Experiences (Component #3)</i>		
Choose one from the following:		3
SPAN 547	Advanced Hispanic Film	
or SPAN 548	Advanced U.S.-Hispanic Film	
SPAN 567	Advanced Study in Chicano Literature	
Total Credits		9

Component #1: Counseling Language Development

CEPY 6220 Spanish for Mental Health Professionals This course will help students acquire the necessary Spanish language skills needed to function as Spanish-speaking mental health professionals. The course will cover psychological terminology, concepts, and theories in Spanish. Examination of the professional roles of bilingual mental health professionals and their roles within Latina/o and underserved communities will also be addressed in this course.

CEPY 5230 Counseling Theory and Technique This course will assist students in learning and practicing basic, culturally-appropriate micro counseling skills in Spanish through individual, dyad, and small group participation.

Component #2: Clinical Experience

CEPY 5997 Special Research Programs/ CEPY 6996 Selected Topics This course will require students to spend a minimum of 6 hours per week at a bilingual site, providing counseling, assessment, or supervision services within a variety of clinical settings that serve Spanish-speaking populations. The Minor coordinator must approve all placements. This course will also integrate a Spanish-speaking student process group for bilingual counseling students. In this group, students will have the opportunity to develop bilingual multicultural counseling competencies. Students may also present clinical cases, theoretical perspectives, interventions or techniques in Spanish and receive feedback and support from other bilingual members. A summer semester immersion experience in providing counseling services in Spanish in a Latin American and/ or primarily Spanish-speaking country may be substituted for this experience.

Students have the option of completing their clinical hours for this course over **2 semesters** if so desired. The course requires an additional 6 clinical hours/week (if taken in one semester) or 3 clinical hours/week (if class is taken over the course of two semesters).

Note: This course is not to replace required practicum or internship experiences necessary for degree completion. Students are allowed to count hours they are accruing for their internship and/or practicum as long as they are (1) enrolled in both courses [598/698 and either 578/675 or 580/684] (2) are meeting the requirements for the 598/698 course [i.e. attending class meetings, etc.] and (3) a separate log is kept documenting work with Spanish speaking clients; this log also has to be signed by both 598/698 instructor and site supervisor

CEPY 6590 Behavioral Health Practicum This course will provide students the opportunity to participate in a supervised service-learning experience within community-based, interdisciplinary, primary care settings that serve medically underserved and high-risk groups. Students will each write and present a case study in Spanish regarding a Spanish-speaking client. Students will receive bilingual supervision regarding various topics

such as training in Motivational Interviewing and discussion of Spanish-speaking clients from their practicum experience.

SOWK 5996 Special Topics This course will allow students to develop and practice skills in Spanish relevant to working with children and families in the child welfare system with a focus on the child protection process.

FCST 525 Supervised Clinical Practice This course offers supervised clinical experience in Marriage and Family Therapy.

Component #3: Sociocultural Experiences

SPAN 547 Advanced Hispanic Film/SPAN 548 Advanced U.S.-Hispanic Film Advanced study of major films from Spain and Spanish-America and/or by Hispanics of the U.S.

SPAN 567 Advanced Study in Chicano Literature Study of all genres of Chicano literature.

*All courses outlined in the Program of Study have to be taken face-to-face. However, Spanish Counseling Minor Committee will review individual requests for any exceptions to this requirement.

Special Education - Graduate Minor

A minor in special education requires 9 credits of graduate coursework that carries the SPED prefix. Official minor documentation must be completed with the School of TPAL.

U.S.-Mexico Border Health Issues - Graduate Minor

A grade of B or higher is required for all requirements for this graduate minor.

Prefix	Title	Credits
Select four courses from the following:		12
PHLS 5610	Health Disparities: Determinants and Interventions	
PHLS 5620	Cross-Cultural Aspects of Health	
PHLS 5630	International Health Problems	
PHLS 5640	Rural Health Issues	
PHLS 5660	U.S.-Mexico Border Health Issues	
PHLS 5996	Special Topics	
PHLS 5996	Special Topics (American Indian Health)	
Total Credits		12

General Education & Viewing a Wider World Courses

Associates/Bachelor's General Education The New Mexico General Education Requirements

General Education at NMSU provides all students with a broad foundation and common framework upon which to develop knowledge and skills, social consciousness and respect for self and others, thus enabling them to function responsibly and effectively now and in the future. General education courses at NMSU can be identified by the G suffix.

In accordance to state law (Post-Secondary Education Articulation Act) (<https://www.srca.nm.gov/parts/title05/05.055.0006.html>), the New Mexico Higher Education Department has established a state-wide model

for General Education. Within the General Education model, is nine credits of electives that will be determined at an institutional level. The current approved NMSU General Education courses are listed below under each of the six general education areas.

Prefix	Title	Credits
Area I: Communications		10
Select one course from each sub group:		
English Composition-Level 1		
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I Multilingual	
English Composition-Level 2		
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		3-4
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1350G	Introduction to Statistics	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
MATH 1521G	Calculus and Analytic Geometry II	
MATH 1521H	Calculus and Analytic Geometry II Honors	
MATH 2134G	Fundamentals of Elementary Math II	
MATH 2350G	Statistical Methods	
MATH 2530G	Calculus III	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ¹		10-11
Area III: Laboratory Sciences		
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1130G	Introductory Anatomy & Physiology (non-majors)	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
C S 171G	Modern Computing in Practice
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
EPWS 1110G	Applied Biology
ENVS 1110G	Environmental Science I
FSTE 2110G	Food Science I
FWCE 1110G	Introduction to Natural Resources Management
GEOG 1110G	Physical Geography
GEOL 1110G	Physical Geology
HNRS 1135G & HNRS 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab
HNRS 2116G	Earth, Time and Life
PHYS 1115G	Survey of Physics with Lab
PHYS 1125G	Physics of Music
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II
Area IV: Social/Behavioral Sciences	
AEEC/FSTE 2130G	Survey of Food and Agricultural Issues
ANTH 1115G	Introduction to Anthropology
ANTH 1137G	Human Ancestors
ANTH 1140G	Introduction to Cultural Anthropology
ANTH 1160G	World Archaeology
ANTH 2140G	Indigenous Peoples of North America
BEST 1110G	Introduction to Borderlands and Ethnic Studies
BUSA 2230G	Human Relations in Business
CEPY 1120G	Human Growth and Behavior
CJUS 1110G	Introduction to Criminal Justice
ECON 1110G	Survey of Economics
ECON 2110G	Macroeconomic Principles
ECON 2110H	Principles of Macroeconomics Honors
ECON 2120G	Microeconomics Principles
ECON 2120H	Principles of Microeconomics Honors
GEOG 1120G	World Regional Geography
GEOG 1130G	Human Geography
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies
GNDR 2120G	Representing Women Across Cultures
HNRS 2161G	Window of Humanity

HNRS 2170G	The Human Mind
HNRS 2172G	Archaeology: Search for the Past
HNRS 2180G	Citizen and State Great Political Issues
HRTM 1120G	Introduction to Tourism
JOUR 105G	Media and Society
LING 2110G	Introduction to the Study of Language and Linguistics
PHLS 1110G	Personal Health & Wellness
PHLS 1110H	Personal Health and Wellness Honors
POLS 1110G	Introduction to Political Science
POLS 1120G	American National Government
POLS 1130G	Issues in American Politics
POLS 2120G	International Relations
PSYC 1110G	Introduction to Psychology
SOCI 1110G	Introduction to Sociology
SOCI 2310G	Contemporary Social Problems
SOWK 2110G	Introduction to Human Services & Social Work
Area V: Humanities	
AFST 1110G	Introduction to Africana Studies
AFST 2110G	African American History
AFST 2140G	Black Women in the African Diaspora
CCST 2110G	Introduction to Chicana and Chicano Studies
ENGL 1410G	Introduction to Literature
ENGL 2520G	Film as Literature
ENGL 2650G	World Literature I
FREN 2120G	French IV
HIST 1105G	Making History
HIST 1110G	United States History I
HIST 1120G	United States History II
HIST 1130G	World History I
HIST 1140G	World History II
HIST 1150G	Western Civilization I
HIST 1160G	Western Civilization II
HIST 2245G	Islamic Civilizations to 1800
HIST 2246G	Islamic Civilizations since 1800
HIST 2250G	East Asia to 1600
HIST 2251G	East Asia since 1600
HNRS 2110G	The Present in the Past: Contemporary Issues and their Historical Roots
HNRS 2117G	The World of the Renaissance: Discovering the Modern
HNRS 2120G	Foundations of Western Culture
HNRS 2140G	Plato and the Discovery of Philosophy
HNRS 2141G	Bamboo and Silk: The Fabric of Chinese Literature
HNRS 2145G	Celtic Literature
HNRS 2160G	New Testament as Literature
HNRS 2165G	Introduction to Humanities in the 21st Century
HNRS 2171G	The Worlds of Arthur
HNRS 2185G	Democracies, Despots and Daily Life
HNRS 2190G	Claiming a Multiracial Past
NATV 1150G	Introduction to Native American Studies
PHIL 1115G	Introduction to Philosophy
PHIL 1120G	Logic, Reasoning, & Critical Thinking
PHIL 1140G	Philosophy and World Religions
PHIL 1145G	Philosophy, Law, and Ethics
PHIL 2110G	Introduction to Ethics

PHIL 2230G	Philosophical Thought	
Area VI: Creative and Fine Arts		3
ARTH 1115G	Orientation in Art	
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
ENGL 2310G	Introduction to Creative Writing	
HNRS 2114G	Music in Time and Space	
HNRS 2115G	Encounters with Art	
HNRS 2130G	Shakespeare on Film	
HNRS 2178G	Theatre: Beginnings to Broadway	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
THEA 1210G	Acting for Non-Majors	
General Education Elective		3-4
This requirement can be met with any "G" course in any area, excluding Area I: Communications and any crosslisted courses, that exceeds the minimum requirement.		
or		
ENGR 100G	Introduction to Engineering	
	or ENGR 100GH Introduction to Engineering Honors	
Total Credits		32-35

¹ For Area III: Laboratory Sciences and Area IV: Social/Behavioral Sciences, students ***must*** take one course from each for a total of 7 credits.

Students will then take an additional course in either Area III or Area IV for 3-4 credits depending on the students selection (i.e. Area III is 4 credits, Area IV is 3 credits).

Alternatives for Meeting General Education Requirements (9 credit hour rule)

Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area. The courses can meet both major and general education requirements for the degree. For example, a student may complete ARTS 2610 Drawing II, ARTS 1240 Design I and ARTS 1250 Design II (9 hours) and thereby satisfy one course from the Area VI: Creative and Fine Arts category even though none of those courses carries a G suffix. Please check with the Center for Academic Advising and Student Support.

Applied Associates Degree

The New Mexico General Education Requirements

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In accordance to state law (Post-Secondary Education Articulation Act) (<https://www.srca.nm.gov/parts/title05/05.055.0006.html>), the New Mexico Higher Education Department has established a state-wide model for General Education. Within the General Education model, is nine credits of electives that will be determined at an institutional level. The current

approved NMSU General Education courses are listed below under each of the six general education areas.

Prefix	Title	Credits
Select one course from four of the following six content areas for a total of 12-14 credits		12-14
Each course selected must be from a different area and students cannot take multiple courses in the same area.		
<i>Area I: Communications</i>		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I Multilingual	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2221G	Writing in the Humanities and Social Science	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1350G	Introduction to Statistics	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
MATH 1521G	Calculus and Analytic Geometry II	
MATH 1521H	Calculus and Analytic Geometry II Honors	
MATH 2134G	Fundamentals of Elementary Math II	
MATH 2350G	Statistical Methods	
MATH 2530G	Calculus III	
<i>Area III: Laboratory Sciences</i>		
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1130G	Introductory Anatomy & Physiology (non-majors)	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
C S 171G	Modern Computing in Practice	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
EPWS 1110G & EPWS 1110L	Applied Biology and Applied Biology Lab
ENVS 1110G	Environmental Science I
FSTE 2110G	Food Science I
GEOG 1110G	Physical Geography
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HNRS 1135G & HNRS 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab
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PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II

Area IV: Social/Behavioral Sciences

AEEC/FSTE 2130G	Survey of Food and Agricultural Issues
ANTH 1115G	Introduction to Anthropology
ANTH 1137G	Human Ancestors
ANTH 1140G	Introduction to Cultural Anthropology
ANTH 1160G	World Archaeology
ANTH 2140G	Indigenous Peoples of North America
BEST 1110G	Introduction to Borderlands and Ethnic Studies
BUSA 2230G	Human Relations in Business
CEPY 1120G	Human Growth and Behavior
CJUS 1110G	Introduction to Criminal Justice
ECON 1110G	Survey of Economics
ECON 2110G	Macroeconomic Principles
ECON 2110H	Principles of Macroeconomics Honors
ECON 2120G	Microeconomics Principles
ECON 2120H	Principles of Microeconomics Honors
GEOG 1120G	World Regional Geography
GEOG 1130G	Human Geography
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies
GNDR 2120G	Representing Women Across Cultures
HNRS 2161G	Window of Humanity
HNRS 2170G	The Human Mind
HNRS 2172G	Archaeology: Search for the Past
HNRS 2180G	Citizen and State Great Political Issues

HRTM 1120G	Introduction to Tourism
JOUR 105G	Media and Society
LING 2110G	Introduction to the Study of Language and Linguistics
PHLS 1110G	Personal Health & Wellness
PHLS 1110H	Personal Health and Wellness Honors
POLS 1110G	Introduction to Political Science
POLS 1120G	American National Government
POLS 1130G	Issues in American Politics
POLS 2120G	International Relations
PSYC 1110G	Introduction to Psychology
SOCI 1110G	Introduction to Sociology
SOCI 2310G	Contemporary Social Problems
SOWK 2110G	Introduction to Human Services & Social Work

Area V: Humanities

AFST 1110G	Introduction to Africana Studies
AFST 2110G	African American History
AFST 2140G	Black Women in the African Diaspora
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HIST 1130G	World History I
HIST 1140G	World History II
HIST 1150G	Western Civilization I
HIST 1160G	Western Civilization II
HIST 2245G	Islamic Civilizations to 1800
HIST 2246G	Islamic Civilizations since 1800
HIST 2250G	East Asia to 1600
HIST 2251G	East Asia since 1600
HNRS 2110G	The Present in the Past: Contemporary Issues and their Historical Roots
HNRS 2117G	The World of the Renaissance: Discovering the Modern
HNRS 2120G	Foundations of Western Culture
HNRS 2140G	Plato and the Discovery of Philosophy
HNRS 2141G	Bamboo and Silk: The Fabric of Chinese Literature
HNRS 2145G	Celtic Literature
HNRS 2160G	New Testament as Literature
HNRS 2165G	Introduction to Humanities in the 21st Century
HNRS 2171G	The Worlds of Arthur
HNRS 2185G	Democracies, Despots and Daily Life
HNRS 2190G	Claiming a Multiracial Past
NATV 1150G	Introduction to Native American Studies
PHIL 1115G	Introduction to Philosophy
PHIL 1120G	Logic, Reasoning, & Critical Thinking
PHIL 1140G	Philosophy and World Religions
PHIL 1145G	Philosophy, Law, and Ethics
PHIL 2110G	Introduction to Ethics
PHIL 2230G	Philosophical Thought

Area VI: Creative and Fine Arts

ARTH 1115G	Orientation in Art
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ARTS 1145G	Visual Concepts
ARTH 2110G	History of Art I
ARTH 2120G	History of Art II
DANC 1110G	Dance Appreciation
ENGL 2310G	Introduction to Creative Writing
HNRS 2114G	Music in Time and Space
HNRS 2115G	Encounters with Art
HNRS 2130G	Shakespeare on Film
HNRS 2178G	Theatre: Beginnings to Broadway
MUSC 1110G	Music Appreciation: Jazz
MUSC 1130G	Music Appreciation: Western Music
THEA 1110G	Introduction to Theatre
THEA 1210G	Acting for Non-Majors
General Education Elective	
This requirement can be met with any "G" course in any area, excluding any crosslisted courses.	
or	
ENGR 100G	Introduction to Engineering
or ENGR 100GH	Introduction to Engineering Honors
Total Credits	3-4
15-18	

Alternatives for Meeting General Education Requirements (9 credit hour Rule)

Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area. The courses can meet both major and general education requirements for the degree. For example, a student may complete ARTS 2610 Drawing II, ARTS 1240 Design I and ARTS 1250 Design II (9 hours) and thereby satisfy one course from the Area VI: Creative and Fine Arts category even though none of those courses carries a G suffix. Please check with the Center for Academic Advising and Student Support.

NMSU Viewing a Wider World Requirements

The Viewing a Wider World (VWW) requirement fosters intelligent inquiry, abstract logical thinking, critical analysis, as well as the integration and synthesis of knowledge. The program strives for literacy in writing, reading, speaking and listening. It teaches mathematical structures, acquainting students with precise abstract thought about numbers and space. The program also encourages an understanding of science and scientific inquiry, as it provides a historical consciousness, including an understanding of one's own heritage as well as respect for other peoples and cultures. To achieve its goals, the program includes an examination of values and stresses the importance of a carefully considered values system as it fosters an appreciation of the arts and general education. It provides the breadth necessary to have a familiarity with the various branches of human understanding. All VWW courses can be identified by the "V" suffix.

Prior to graduating, NMSU students are required to take two courses from separate colleges from the Viewing a Wider World list in the Catalog. These courses are upper-division (300-400 level) Viewing a Wider World courses and should be taken in a student's junior and/or senior year. One of the two courses must be in a college other than their own. The other course may be taken within their home college, but this course:

1. must be in a different department from their major department;
2. must not be cross-listed with a course in their home department;
3. cannot be counted as one of the requirements for the student's major.

These courses strongly emphasize the international character and multicultural influences in the fields of study and strengthen information retrieval skills. There are two options that NMSU allows for replacing 3 credits of VWW requirement with another form of educational experience, these are:

1. **Study Abroad Experience-** consisting of at least four weeks of a Study Abroad program or university coursework in a foreign country earning 3 credits.
2. **Military Experience-** for students who have served at least four weeks of military service in a foreign country.

The Military and Veterans Programs Office website (<https://mvp.nmsu.edu/military-members/military-experience-waiver.html>) provides the instructions on how to request the waiver for Military Experience replacing 3 credits of VWW.

NOTE: This list is under continuous revision. Please check with the office of the college associate dean or with college advisors for additional eligible courses. Honors courses have a specific college designation based on course content. These are listed near the end of this section.

College of Agricultural, Consumer and Environmental Sciences

Prefix	Title	Credits
ACOM 3160V	Communicating Agriculture & Science to the Public	3
AEEC 315V	World Agriculture and Food Problems	3
AEEC 337V	Natural Resource Economics	3
AEEC 384V	Water Resource Economics	3
AEEC 445V	Agricultural Policy	3
AGRO 303V	Genetics and Society	3
ANSC 312V	Companion Animals and the Human- Animal Interaction	3
ANSC 351V	Agricultural Animals of the World	3
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 380V	Science & Society	3
FCST 302V	Introduction to Child Advocacy	3
FCST 449V	Family Ethnicities and Subcultures	3
HORT 302V	Forestry and Society	3
HORT 318V	Urban Water Issues and Society	3
RGSC 302V	Forestry and Society	3
HRTM 436V	Sustainability in the Hospitality Industry	3

College of Arts and Sciences

Prefix	Title	Credits
ANTH 305V	Contemporary Native Americans	3
ANTH 306V	Peoples of Latin America	3
ANTH 307V	Japanese Culture and Society: Anthropological Perspectives	3
ANTH 313V	Ancient Mexico	3
ANTH 330V	Magic Witchcraft and Religion	3
ANTH 357V	Medical Anthropology	3
ANTH 360V	Food and Culture Around the World	3
ANTH 362V	Environmental Anthropology	3
ANTH 431V	Nutritional Anthropology	3

ANTH 433V	Sex, Gender and Culture	3
ASTR 301V	Revolutionary Ideas in Astronomy	3
ASTR 305V	The Search for Life in the Universe	3
ASTR 308V	Into the Final Frontier	3
CCST 3120V	Chicana/o Genders and Sexualities	3
CJUS 440V	Comparative Criminal Justice Systems	3
ENGL 321V	Modern European Drama	3
ENGL 327V	Shakespeare around the Globe	3
ENGL 328V	Literature of Science Fiction and Fantasy	3
ENGL 339V	Chicana/o Literature	3
ENGL 380V	Women Writers	3
ENGL 392V	Mythology	3
ENGL 394V	Southwestern Literature	3
FREN 365V	Perspectives in French Culture	3
GEOG 315V	World Agriculture and Food Problems	3
GEOG 325V	New Mexico and the American West	3
GEOG 328V	Geography of Latin America	3
GEOG 331V	Europe	3
GEOG 361V	Economic Geography	3
GEOG 363V	Cultural Geography	3
GEOG 365V	Urban Geography	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GNDR 380V	Women Writers	3
GNDR 381V	Women's Health Issues	3
GNDR 433V	Sex, Gender and Culture	3
HIST 302V	Science in Modern Society	3
HIST 308V	The History of Food	3
HIST 311V	Colonial Latin America	3
HIST 312V	Modern Latin America	3
HIST 321V	History of Korea	3
HIST 330V	Introduction to Religious Studies	3
HIST 366V	British Imperialism	3
HIST 374V	The European City: History and Culture	3
HIST 379V	The History of Italy from the Etruscans to the Mafia	3
HIST 382V	Modern Russia	3
HIST 390V	The Holocaust	3
JOUR 350V	Media History	3
JOUR 377V	Mass Media Ethics	3
JOUR 460V	Sports & Entertainment P.R.	3
LING 302V	Language and Society	3
MATH 411V	Great Theorems in Mathematics	3
NATV 4120V	Native American Visual Culture	3
PHIL 323V	Engineering Ethics	3
PHYS 303V	Energy and Society in the New Millennium	3
PHYS 305V	The Search for Water in the Solar System	3
POLS 380V	Contemporary World Political Ideologies	3
SPAN 364V	Culture and Civilization of Mexico	3
SPAN 365V	Culture and Civilization of Spanish America	3
THEA 307V	Society in Style: Fashion, History and Culture	3
THEA 321V	Modern European Drama	3

College of Business

Prefix	Title	Credits
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	3
BLAW 385V	Employment and Consumer Law	3
ECON 324V	Developing Nations	3
ECON 325V	Economic Development of Latin America	3
ECON 335V	Business and Government	3
ECON 337V	Natural Resource Economics	3
ECON 384V	Water Resource Economics	3
ECON 432V	Economics of Health Care	3
MGMT 310V	Entrepreneurial Mindset	3
MGMT 335V	Business and Government	3
MGMT 345V	Quality and Competitiveness: An International Perspective	3
MGMT 388V	Leadership and Ethics	3
MKTG 311V	Consumer Behavior	3

College of Engineering

Prefix	Title	Credits
C E 355V	Technology and the Global Environment	3
CHME 395V	Brewing Science and Society	3
E T 309V	Manufacturing: History and Technology	3
E T 360V	Technology in Business and Society	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3

College of Health, Education and Social Transformation

Prefix	Title	Credits
CEPY 3210V	Human Relations Training	3
CEPY 4110V	Introduction to Counseling	3
DANC 3510V	World Dance	3
EDUC 3110V	Multicultural Issues in Society	3
ELAD 3110V	Introduction to Educational Leadership in a Global Society	3
PHLS 3110V	Human Sexuality	3
PHLS 3120V	Women's Health Issues	3
PHLS 3130V	Global Environmental Health Issues	3
PHLS 4620V	Cross-Cultural Aspects of Health	3
SOCI 3110V	Sociology of Religion	3
SOCI 3120V	Introduction to Population Studies	3
SOCI 3245V	Comparative Family Systems	3
SOCI 3310V	Social Issues in the Rural Americas	3
SOCI 3340V	Social Change	3
SOCI 3610V	Sociology of Pop Culture	3
SOCI 3620V	Sports and Society: A Global Perspective	3
SOCI 4240V	Comparative Global Family Systems	3
SOCI 4335V	Advanced Environmental Sociology	3
SOWK 3140V	Introduction to Social Policy: History	3

University Library

Prefix	Title	Credits
LIBR 311V	Information Literacy	3

Honors - Viewing a Wider World

College of Agricultural, Consumer and Environmental Sciences

Prefix	Title	Credits
HNRS 321V	Agriculture in an Interconnected World	3

College of Arts and Sciences

Prefix	Title	Credits
HNRS 304V	Dilemmas of War and Peace	3
HNRS 305V	Is Fake News Real: Journalism, Community, and Mass Communications	3
HNRS 306V	Science, Ethics and Society	3
HNRS 317V	Cultural Lessons on Nazism	3
HNRS 318V	The World of Cinema	3
HNRS 324V	Science and the Arts: Theatre and Story	3
HNRS 326V	Art and Mythology	3
HNRS 328V	Rock History: 20th Century Popular Music	3
HNRS 336V	Testimonios from the Borderlands	3
HNRS 341V	The Old Testament as Literature	3
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	3
HNRS 349V	Islam and the West: Cultural Contacts, Conflicts, and Exchanges	3
HNRS 353V	Justice without Prejudice	3
HNRS 362V	Native American Philosophy and Spirituality	3
HNRS 370V	Design: The Creative Act	3
HNRS 371V	Paris: Beyond the Eiffel Tower	3
HNRS 374V	The European City: History and Culture	3
HNRS 390V	Worlds of Buddhism	3
HNRS 394V	Southwestern and Border Literature	3
HNRS 411V	Great Theorems in Mathematics	3
HNRS 450V	The Sundt Honors Seminar	3

College of Business

Prefix	Title	Credits
HNRS 303V	Personal Financial Planning and Investing in a Global Economy Honors	3
HNRS 335V	Legal Issues in Modern Society	3
HNRS 381V	Economic Development of Latin America	3

College of Engineering

Prefix	Title	Credits
HNRS 378V	Technology and Policy	3

College of Health, Education and Social Transformation

Prefix	Title	Credits
HNRS 347V	World Dance	3
HNRS 387V	Comparative Perspectives on Women	3
HNRS 388V	Leadership and Society	3

Alternatives for Meeting Viewing a Wider World Requirements

Students taking nine or more credits in a specific subject area, even though the courses are not designated as Viewing a Wider World courses, will have met the VWW requirements for that subject area.

The 9 credit hours must be in 300- to 400-level courses in one prefix area. For example, 9 upper-division ECON credits would fulfill one VWW area for students majoring in programs other than Economics.

Common Course Numbering Crosswalk

The Post-secondary Education Articulation Act (https://hed.state.nm.us/resources-for-schools/public_schools/nm-course-numbering-system/) charges the New Mexico Higher Education Department with establishing and maintaining a common course numbering system, in consultation with faculty. To this end, the common course numbering system includes both equivalent (Common) and unique courses.

- **Common Course:** is any course that is offered at multiple institutions throughout the state, has the same prefix/number combination, the same title, the same description, and at least 80% of the learning outcomes for the course are the same.
- **Unique Course:** is any course that is unique to the institution (the NMSU system), has a prefix/number combination, title, description and learning outcomes that are unique to the institution (the NMSU System).

The table below shows the previous NMSU System-wide course prefix/number combination, the future Common Course Numbering prefix/number combination, and an indicator of whether the course is deemed Common or Unique throughout the state.

Current Course	Past Course	Course Type Indicator
ACCT-ACCOUNTING		
ACCT 2110	ACCT 221	Common
ACCT 2120	ACCT 222	Common
ACES-AGRI,CONSUMER & ENV SCIE		
ACES 1120	ACES 111	Unique
ACES 1210	ACES 121	Unique
ACES 1220	ACES 199	Unique
ACOM-AG COMMUNICATION		
ACOM 1110	AXED 1120	Unique
ACOM 1130G	AXED 2120G	Unique
ACOM 3110	AXED 360	N/A
AEEC-AGRICULTURAL ECONOMICS		

AEEC 1110	AG E 100	Common
AEEC 1120	AG E 101	Unique
AEEC 2110	AG E 236	Unique
AEEC 2120	AG E 260	Unique
AEEC 2130G	AG E 210G	Unique
AEEC 2140	AG E 250	Unique
AEEC 2996	AG E 200	Unique
AEEC 300	AG E 300	N/A
AEEC 305	AG E 305	N/A
AEEC 311	AG E 311	N/A
AEEC 313	AG E 313	N/A
AEEC 314	AG E 314	N/A
AEEC 315V	AG E 315V	N/A
AEEC 325	AG E 325	N/A
AEEC 337V	AG E 337V	N/A
AEEC 340	AG E 340	N/A
AEEC 342	AG E 342	N/A
AEEC 350	AG E 350	N/A
AEEC 375	AG E 375	N/A
AEEC 384	AG E 384V	N/A
AEEC 385	AG E 385	N/A
AEEC 400	AG E 400	N/A
AEEC 420	AG E 420	N/A
AEEC 425	AG E 425	N/A
AEEC 445V	AG E 445V	N/A
AEEC 451	AG E 451	N/A
AEEC 452	AG E 452	N/A
AEEC 456	AG E 456	N/A
AEEC 458	AG E 458	N/A
AEEC 470	AG E 470	N/A
AEEC 499	AG E 499	N/A
AGRO-AGRONOMY		
AGRO 1110G	AGRO 100G	Common
AGRO 2160	AGRO 250	Unique
AGRO 2996	AGRO 200	Unique
ANSC-ANIMAL SCIENCE		
ANSC 1110	ANSC 220	Common
ANSC 1120	ANSC 100	Common
ANSC 1120H	ANSC 100 H	Unique
ANSC 1120L	ANSC 100 L	Unique
ANSC 1130	ANSC 190	Unique
ANSC 1140	ANSC 205	Unique
ANSC 1160	ANSC 103	Unique
ANSC 1170	ANSC 261	Unique
ANSC 1180	ANSC 112	Unique
ANSC 2120	ANSC 288	Common
ANSC 2130	ANSC 290	Common
ANSC 2140	ANSC 285	Unique
ANSC 2150	ANSC 289	Unique
ANSC 2310	ANSC 262	Common
ANSC 2330	ANSC 200	Common
ANSC 2340	ANSC 201	Common

ANSC 2996	ANSC 250	Unique
ANTH-ANTHROPOLOGY		
ANTH 1115G	ANTH 201G	Common
ANTH 1135G	ANTH 130G	Common
ANTH 1135L	ANTH 130GL	Common
ANTH 1136	ANTH 118	Unique
ANTH 1137G	ANTH 120G	Unique
ANTH 1140G	ANTH 125G	Common
ANTH 1160G	ANTH 202G	Common
ANTH 2140G	ANTH 115	Common
ANTH 2150	ANTH 116	Common
ANTH 2996	ANTH 297	Unique
ARCH-ARCHITECTURE		
ARCH 1105	ARCT 150	Unique
ARCH 1110	ARCT 104	Common
ARCH 1112	ARCT 124	Unique
ARCH 1114	ARCT 154	Unique
ARCH 1120	ARCT 101	Common
ARCH 1121	ARCT 170	Unique
ARCH 1122	ARCT 204	Unique
ARCH 1220	ARCT 111	Unique
ARCH 2111	ARCT 210	Unique
ARCH 2113	ARCT 224	Unique
ARCH 2114	ARCT 250	Unique
ARCH 2115	ARCT 254	Unique
ARCH 2116	ARCT 260	Unique
ARCH 2122	ARCT 274	Unique
ARCH 2124	ARCT 295	Unique
ARCH 2220	ARCT 211	Unique
ARCH 2994	ARCT 264	Unique
ARCH 2995	ARCT 291	Unique
ARCH 2996	ARCT 290	Unique
ARSC-ARTS & SCIENCES		
ARSC 1115	A S 101	Unique
ARSC 1120	A S 103	Unique
ARSC 2996	A S 200	Unique
ARSC 3110	A S 305	N/A
ARSC 3130	A S 350	N/A
ARSC 3996	A S 300	N/A
ARSC 4550	A S 480	N/A
ARSC 4555	A S 490	N/A
ARTH-ART HISTORY		
ARTH 1115G	ART 101G	Common
ARTH 2110G	ART 295G	Common
ARTH 2120G	ART 296G	Common
ARTH 2136	ARTS 2671	Unique
ARTH 300	ART 300	N/A
ARTH 305	ART 305	N/A
ARTH 310	ART 310	N/A
ARTH 311	ART 311	N/A
ARTH 312	ART 312	N/A
ARTH 321	ART 321	N/A

ARTH 323	ART 323	N/A
ARTH 325	ART 325	N/A
ARTH 330	ART 330	N/A
ARTH 336	ART 336	N/A
ARTH 338	ART 338	N/A
ARTH 339	ART 339	N/A
ARTH 342	ART 342	N/A
ARTH 343	ART 343	N/A
ARTH 390	ART 390	N/A
ARTH 444	ART 444	N/A
ARTH 477	ART 477	N/A
ARTH 478	ART 478	N/A
ARTH 479	ART 479	N/A
ARTH 500	ART 500	N/A
ARTH 510	ART 510	N/A
ARTH 511	ART 511	N/A
ARTH 521	ART 521	N/A
ARTH 525	ART 525	N/A
ARTH 536	ART 536	N/A
ARTH 538	ART 538	N/A
ARTH 539	ART 539	N/A
ARTH 542	ART 542	N/A
ARTH 543	ART 543	N/A
ARTH 578	ART 578	N/A
ARTH 579	ART 579	N/A
ARTH 597	ART 597	N/A
ARTH 599	ART 599	N/A
ARTS-ART STUDIO		
ARTS 1121	ART 125	Unique
ARTS 1145G	ART 110G	Unique
ARTS 1240	ART 155	Common
ARTS 1250	ART 156	Common
ARTS 1310	ART 275	Common
ARTS 1320	ART 276	Common
ARTS 1410	ART 270	Common
ARTS 1520	ART 161	Common
ARTS 1520	ART 272	Common
ARTS 1610	ART 150	Common
ARTS 1610	ART 250	Common
ARTS 1630	ART 260	Common
ARTS 1710	ART 280	Common
ARTS 1711	ART 160	Unique
ARTS 1712	ART 163	Unique
ARTS 1713	ART 165	Unique
ARTS 1810	ART 285	Common
ARTS 2010	ART 267	Common
ARTS 2355	ART 286	Unique
ARTS 2410	OEPT 100	Common
ARTS 2430	OEPT 155	Common
ARTS 2431	ART 255	Unique
ARTS 2440	OEPT 120	Unique
ARTS 2610	ART 151	Common

ARTS 2611	ART 269	Unique
ARTS 2616	ART 252	Unique
ARTS 2630	ART 261	Common
ARTS 2635	ART 262	Common
ARTS 2839	ART 265	Unique
ARTS 2993	ART 208	Unique
ARTS 2996	ART 294	Unique
ARTS 308	ART 308	N/A
ARTS 340	ART 340	N/A
ARTS 350	ART 350	N/A
ARTS 355	ART 355	N/A
ARTS 360	ART 360	N/A
ARTS 365	ART 365	N/A
ARTS 370	ART 370	N/A
ARTS 373	ART 373	N/A
ARTS 374	ART 374	N/A
ARTS 375	ART 375	N/A
ARTS 376	ART 376	N/A
ARTS 385	ART 385	N/A
ARTS 394	ART 394	N/A
ARTS 401	ART 401	N/A
ARTS 402	ART 402	N/A
ARTS 403	ART 403	N/A
ARTS 404	ART 404	N/A
ARTS 440	ART 440	N/A
ARTS 450	ART 450	N/A
ARTS 455	ART 455	N/A
ARTS 465	ART 465	N/A
ARTS 470	ART 470	N/A
ARTS 474	ART 474	N/A
ARTS 475	ART 475	N/A
ARTS 485	ART 485	N/A
ARTS 490	ART 490	N/A
ARTS 494	ART 494	N/A
ARTS 495	ART 495	N/A
ARTS 496	ART 496	N/A
ARTS 499	ART 499	N/A
ARTS 501	ART 501	N/A
ARTS 502	ART 502	N/A
ARTS 503	ART 503	N/A
ARTS 504	ART 504	N/A
ARTS 540	ART 540	N/A
ARTS 550	ART 550	N/A
ARTS 555	ART 555	N/A
ARTS 560	ART 560	N/A
ARTS 565	ART 565	N/A
ARTS 570	ART 570	N/A
ARTS 575	ART 575	N/A
ARTS 576	ART 576	N/A
ARTS 580	ART 580	N/A
ARTS 585	ART 585	N/A
ARTS 595	ART 595	N/A

ARTS 596	ART 596	N/A
ARTS 598	ART 598	N/A
ASTR-ASTRONOMY		
ASTR 1115G	ASTR 110G	Common
ASTR 1116	ASTR 199	Unique
ASTR 1120G	ASTR 105G	Unique
AXED-AGRICULTURAL EXTN EDUC		
AXED 1110	AXED 100	Unique
AXED 1130	AXED 105	Unique
AXED 2110	AXED 205	Common
AXED 2130	AXED 230	Unique
AXED 2140	AXED 232	Unique
AXED 2996	AXED 200	Unique
AXED 3115	AXED 303	N/A
AXED 3120	AXED 331	N/A
AXED 3130	AXED 348	N/A
AXED 3150	AXED 380	N/A
AXED 3210V	AXED 466V	N/A
AXED 3996	AXED 300	N/A
AXED 4110	AXED 400	N/A
AXED 4210	AXED 443	N/A
AXED 4215	AXED 445	N/A
AXED 4220	AXED 446	N/A
AXED 4230	AXED 447	N/A
AXED 4235	AXED 448	N/A
AXED 4510	AXED 456	N/A
AXED 4520	AXED 460	N/A
AXED 4610	AXED 475	N/A
AXED 4620	AXED 484	N/A
AXED 4710	AXED 488	N/A
AXED 4715	AXED 489	N/A
AXED 4991	AXED 499	N/A
AXED 4997	AXED 490	N/A
AXED 5110	AXED 500	N/A
AXED 5155	AXED 515	N/A
AXED 5160	AXED 530	N/A
AXED 5170	AXED 536	N/A
AXED 5210	AXED 543	N/A
AXED 5215	AXED 545	N/A
AXED 5220	AXED 546	N/A
AXED 5230	AXED 547	N/A
AXED 5235	AXED 548	N/A
AXED 5310	AXED 565	N/A
AXED 5510	AXED 556	N/A
AXED 5515	AXED 571	N/A
AXED 5610	AXED 575	N/A
AXED 5615	AXED 586	N/A
AXED 5993	AXED 594	N/A
AXED 5994	AXED 598	N/A
AXED 5996	AXED 590	N/A
AXED 5998	AXED 595	N/A
AXED 5999	AXED 599	N/A

BCIS- BUSINESS COMPUTER SYSTEMS

BCIS 1110	BCIS 110	Common
BCIS 1110	C S 110	Common

BFIN-BUSINESS FINANCE

BFIN 2110	FIN 206	Common
BFIN 2110	FIN 210	Common
BFIN 303V	FIN 303V	N/A
BFIN 311	FIN 311	N/A
BFIN 322	FIN 322	N/A
BFIN 323	FIN 323	N/A
BFIN 324	FIN 324	N/A
BFIN 325	FIN 325	N/A
BFIN 326	FIN 326	N/A
BFIN 341	FIN 341	N/A
BFIN 355	FIN 355	N/A
BFIN 360	FIN 360	N/A
BFIN 385	FIN 385	N/A
BFIN 391	FIN 391	N/A
BFIN 392	FIN 392	N/A
BFIN 393	FIN 393	N/A
BFIN 406	FIN 406	N/A
BFIN 421	FIN 421	N/A
BFIN 435	FIN 435	N/A
BFIN 445	FIN 445	N/A
BFIN 455	FIN 455	N/A
BFIN 470	FIN 470	N/A
BFIN 475	FIN 475	N/A
BFIN 480	FIN 480	N/A
BFIN 490	FIN 490	N/A
BFIN 498	FIN 498	N/A
BFIN 500	FIN 500	N/A
BFIN 503	FIN 503	N/A
BFIN 511	FIN 511	N/A
BFIN 521	FIN 521	N/A
BFIN 535	FIN 535	N/A
BFIN 545	FIN 545	N/A
BFIN 555	FIN 555	N/A
BFIN 575	FIN 575	N/A
BFIN 581	FIN 581	N/A
BFIN 590	FIN 590	N/A
BFIN 598	FIN 598	N/A

BIOL-BIOLOGY

BIOL 1120G	BIOL 101G	Unique
BIOL 1120L	BIOL 101GL	Unique
BIOL 1130G	BIOL 154	Common
BIOL 1190G	BIOL 110G	Unique
BIOL 1996	BIOL 150	Unique
BIOL 2110G	BIOL 211G	Unique
BIOL 2110L	BIOL 211GL	Unique
BIOL 2210	BIOL 225	Common
BIOL 2221	BIOL 254	Unique
BIOL 2225	BIOL 226	Common

BIOL 2310	BIOL 221	Common
BIOL 2310L	BIOL 221 L	Common
BIOL 2320	BIOL 219	Unique
BIOL 2505	BIOL 227	Common
BIOL 2511	BIOL 262	Common
BIOL 2512	BIOL 263	Unique
BIOL 2610G	BIOL 111G	Common
BIOL 2610L	BIOL 111GL	Common
BIOL 2996	BIOL 250	Unique
BLAW-BUSINESS LAW		
BLAW 2110	BLAW 230	Common
BLAW 2110	BMGT 231	Common
BLED-BILINGUAL EDUCATION		
BLED 1110	EDUC 103	Common
BLED 2110	EDUC 204	Common
BLED 3110	BLED 303	N/A
BLED 3120	BLED 342	N/A
BLED 3130	BLED 343	N/A
BLED 3140	BLED 344	N/A
BLED 4110	BLED 483	N/A
BLED 4996	BLED 489	N/A
BLED 5110	BLED 504	N/A
BLED 5120	BLED 505	N/A
BLED 5130	BLED 520	N/A
BLED 5210	BLED 522	N/A
BLED 5220	BLED 542	N/A
BLED 5230	BLED 543	N/A
BLED 5310	BLED 545	N/A
BLED 5320	BLED 583	N/A
BLED 5330	BLED 584	N/A
BLED 5410	BLED 585	N/A
BLED 5420	BLED 587	N/A
BLED 5990	EDUC 590	N/A
BLED 5992	BLED 570	N/A
BLED 5996	BLED 560	N/A
BLED 5998	BLED 550	N/A
BLED 6110	BLED 616	N/A
BLED 6120	BLED 617	N/A
BLED 6130	BLED 621	N/A
BLED 6210	BLED 623	N/A
BLED 6220	BLED 633	N/A
BLED 6310	BLED 635	N/A
BLED 6320	BLED 637	N/A
BLED 6992	BLED 670	N/A
BLED 6998	BLED 640	N/A
BUSA-BUSINESS ADMINISTRATION		
BUSA 1110	BMGT 110	Common
BUSA 1110	BUSA 111	Common
CAST-CHILD ADVOCACY STUDIES		
CAST 1110	CAST 201	Unique
CAST 2110	CAST 202	Unique
CAST 2120	CAST 203	Unique

CEPY-COUNSELING & EDUC PSY

CEPY 1120G	C EP 110G	Unique
CEPY 1150	C EP 199	Unique
CEPY 2110	C EP 210	Common
CEPY 2120	C EP 215	Unique
CEPY 2130	C EP 240	Unique
CEPY 2140	C EP 298	Unique
CEPY 2140H	C EP 298 H	Unique
CEPY 3110	CEPY 320	N/A
CEPY 3210V	CEPY 300V	N/A
CEPY 4110V	CEPY 451V	N/A
CEPY 4120	CEPY 420	N/A
CEPY 4130	CEPY 455	N/A
CEPY 4140	CEPY 461	N/A
CEPY 4150	CEPY 495	N/A
CEPY 4150H	CEPY 495 H	N/A
CEPY 4997	CEPY 499	N/A
CEPY 4998	CEPY 498	N/A
CEPY 5110	CEPY 503	N/A
CEPY 5120	CEPY 512	N/A
CEPY 5130	CEPY 517	N/A
CEPY 5140	CEPY 515	N/A
CEPY 5150	CEPY 520	N/A
CEPY 5160	CEPY 522	N/A
CEPY 5170	CEPY 524	N/A
CEPY 5180	CEPY 556	N/A
CEPY 5210	CEPY 532	N/A
CEPY 5220	CEPY 542	N/A
CEPY 5230	CEPY 550	N/A
CEPY 5235	CEPY 554	N/A
CEPY 5240	CEPY 558	N/A
CEPY 5250	CEPY 562	N/A
CEPY 5260	CEPY 566	N/A
CEPY 5270	CEPY 551	N/A
CEPY 5280	CEPY 563	N/A
CEPY 5310	CEPY 505	N/A
CEPY 5320	CEPY 552	N/A
CEPY 5985	CEPY 572	N/A
CEPY 5990	CEPY 578	N/A
CEPY 5997	CEPY 598	N/A
CEPY 5998	CEPY 580	N/A
CEPY 5999	CEPY 599	N/A
CEPY 6120	CEPY 612	N/A
CEPY 6130	CEPY 617	N/A
CEPY 6140	CEPY 615	N/A
CEPY 6150	C EP 619	N/A
CEPY 6160	CEPY 540	N/A
CEPY 6170	CEPY 618	N/A
CEPY 6180	CEPY 579	N/A
CEPY 6185	CEPY 624	N/A
CEPY 6190	CEPY 622	N/A
CEPY 6210	CEPY 630	N/A

CEPY 6220	CEPY 616	N/A
CEPY 6240	CEPY 658	N/A
CEPY 6250	CEPY 662	N/A
CEPY 6260	CEPY 671	N/A
CEPY 6265	CEPY 608	N/A
CEPY 6270	CEPY 651	N/A
CEPY 6320	CEPY 652	N/A
CEPY 6330	CEPY 646	N/A
CEPY 6340	CEPY 647	N/A
CEPY 6350	CEPY 648	N/A
CEPY 6410	CEPY 634	N/A
CEPY 6420	CEPY 642	N/A
CEPY 6425	CEPY 632	N/A
CEPY 6430	CEPY 636	N/A
CEPY 6440	CEPY 637	N/A
CEPY 6450	CEPY 693	N/A
CEPY 6510	CEPY 672	N/A
CEPY 6520	CEPY 676	N/A
CEPY 6530	CEPY 675	N/A
CEPY 6540	CEPY 681	N/A
CEPY 6550	CEPY 673	N/A
CEPY 6560	CEPY 677	N/A
CEPY 6570	CEPY 678	N/A
CEPY 6580	CEPY 679	N/A
CEPY 6590	CEPY 670	N/A
CEPY 6610	CEPY 684	N/A
CEPY 6620	CEPY 680	N/A
CEPY 6630	CEPY 682	N/A
CEPY 6640	CEPY 685	N/A
CEPY 6996	CEPY 698	N/A
CEPY 6999	CEPY 699	N/A
CEPY 7000	C EP 700	N/A

CHEM-CHEMISTRY

CHEM 1111	CHEM 100	Unique
CHEM 1120G	CHEM 110G	Common
CHEM 1121	CHEM 101	Unique
CHEM 1122	CHEM 102	Unique
CHEM 1123	CHEM 103	Unique
CHEM 1215G	CHEM 111G	Common
CHEM 1216	CHEM 115	Unique
CHEM 1225G	CHEM 112G	Common
CHEM 1226	CHEM 116	Unique
CHEM 2111	CHEM 242	Unique
CHEM 2115	CHEM 211	Common
CHEM 2120	CHEM 210	Common
CHEM 2226	CHEM 217	Unique
CHEM 2991	CHEM 241	Unique
CHEM 2996	CHEM 251	Unique

CHIN-CHINESE

CHIN 1110	CHIN 111	Common
CHIN 1120	CHIN 112	Common
CHIN 2110	CHIN 211	Common

CHIN 2120	CHIN 212	Common
CHSS-CONN HEALTH/SOC SRVCS		
CHSS 1110	CHSS 101	Unique
CHSS 2110	CHSS 216	Unique
CHSS 2510	CHSS 299	Common
CHSS 2511	CHSS 295	Unique
CJUS-CRIMINAL JUSTICE		
CJUS 1110G	C J 101G	Common
CJUS 1120	C J 205	Common
CJUS 1996	C J 199	Unique
CJUS 2120	C J 250	Common
CJUS 2140	C J 221	Common
CJUS 2150	C J 230	Common
CJUS 2160	C J 293	Common
CJUS 2220	C J 210	Common
CJUS 300	C J 300	N/A
CJUS 301	C J 301	N/A
CJUS 302	C J 302	N/A
CJUS 303	C J 303	N/A
CJUS 304	C J 304	N/A
CJUS 306	C J 306	N/A
CJUS 307	C J 307	N/A
CJUS 321	C J 321	N/A
CJUS 331	C J 331	N/A
CJUS 332	C J 332	N/A
CJUS 333	C J 333	N/A
CJUS 345	C J 345	N/A
CJUS 346	C J 346	N/A
CJUS 347	C J 347	N/A
CJUS 348	C J 348	N/A
CJUS 360	C J 360	N/A
CJUS 380	C J 380	N/A
CJUS 391	C J 391	N/A
CJUS 393	C J 393	N/A
CJUS 399	C J 399	N/A
CJUS 405	C J 405	N/A
CJUS 410	C J 410	N/A
CJUS 412	C J 412	N/A
CJUS 414	C J 414	N/A
CJUS 416	C J 416	N/A
CJUS 417	C J 417	N/A
CJUS 424	C J 424	N/A
CJUS 425	C J 425	N/A
CJUS 427	C J 427	N/A
CJUS 428	C J 428	N/A
CJUS 429	C J 429	N/A
CJUS 430	C J 430	N/A
CJUS 431	C J 431	N/A
CJUS 432	C J 432	N/A
CJUS 434	C J 434	N/A
CJUS 435	C J 435	N/A
CJUS 436	C J 436	N/A

CJUS 437	C J 437	N/A
CJUS 440V	C J 440V	N/A
CJUS 449	C J 449	N/A
CJUS 451	C J 451	N/A
CJUS 453	C J 453	N/A
CJUS 454	C J 454	N/A
CJUS 455	C J 455	N/A
CJUS 484	C J 484	N/A
CJUS 501	C J 501	N/A
CJUS 511	C J 511	N/A
CJUS 514	C J 514	N/A
CJUS 515	C J 515	N/A
CJUS 520	C J 520	N/A
CJUS 524	C J 524	N/A
CJUS 525	C J 525	N/A
CJUS 527	C J 527	N/A
CJUS 529	C J 529	N/A
CJUS 531	C J 531	N/A
CJUS 532	C J 532	N/A
CJUS 535	C J 535	N/A
CJUS 537	C J 537	N/A
CJUS 541	C J 541	N/A
CJUS 545	C J 545	N/A
CJUS 555	C J 555	N/A
CJUS 560	C J 560	N/A
CJUS 581	C J 581	N/A
CJUS 591	C J 591	N/A
CJUS 592	C J 592	N/A
CJUS 593	C J 593	N/A
CJUS 599	C J 599	N/A
COMM-COMMUNICATION		
COMM 1115G	COMM 265G	Common
COMM 1130G	COMM 253G	Common
COMM 2110	COMM 285	Unique
COMM 2111	COMM 250	Unique
COMM 2996	COMM 291	Unique
COMM 2997	COMM 290	Unique
CTFM-CLTHNG/TXTLS/FSHN MRCHDSG		
CTFM 1110	CTFM 178	Unique
CTFM 2120	CTFM 270	Unique
CTFM 2130	CTFM 273	Unique
CTFM 2990	CTFM 202	Unique
DANC-DANCE		
DANC 1110G	DANC 101G	Common
DANC 1130	DANC 123	Common
DANC 1131	DANC 125	Unique
DANC 1135	DANC 109	Unique
DANC 1140	DANC 129	Common
DANC 1150	DANC 126	Common
DANC 1155	DANC 102	Common
DANC 1185	DANC 121	Unique
DANC 1220	DANC 122	Unique

DANC 1235	DANC 118	Unique
DANC 2114	DANC 204	Unique
DANC 2130	DANC 223	Common
DANC 2130L	DANC 223 L	Unique
DANC 2140	DANC 229	Common
DANC 2140L	DANC 229 L	Unique
DANC 2142	DANC 210	Unique
DANC 2142L	DANC 210 L	Unique
DANC 2150	DANC 226	Common
DANC 2150L	DANC 226 L	Unique
DANC 2155	DANC 207	Unique
DANC 2157	DANC 212	Unique
DANC 2161	DANC 227	Unique
DANC 2250	DANC 205	Unique
DANC 2251	DANC 206	Unique
DANC 2265	DANC 289	Unique
DANC 2270	DANC 280	Unique
DANC 2310	DANC 222	Unique
DANC 2311	DANC 225	Unique
DANC 2320	DANC 232	Unique
DANC 2321	DANC 235	Unique
DANC 3110	DANC 345	N/A
DANC 3114	DANC 304	N/A
DANC 3130	DANC 323	N/A
DANC 3130L	DANC 323 L	N/A
DANC 3140	DANC 329	N/A
DANC 3140L	DANC 329 L	N/A
DANC 3142	DANC 310	N/A
DANC 3142L	DANC 310 L	N/A
DANC 3145	DANC 339	N/A
DANC 3150	DANC 326	N/A
DANC 3150L	DANC 326 L	N/A
DANC 3155	DANC 307	N/A
DANC 3157	DANC 312	N/A
DANC 3175	DANC 375	N/A
DANC 3250	DANC 305	N/A
DANC 3251	DANC 306	N/A
DANC 3265	DANC 389	N/A
DANC 3310	DANC 322	N/A
DANC 3311	DANC 325	N/A
DANC 3320	DANC 332	N/A
DANC 3321	DANC 335	N/A
DANC 3510V	DANC 451V	N/A
DANC 4250	DANC 466	N/A
DANC 4266	DANC 489	N/A
DANC 4310	DANC 422	N/A
DANC 4311	DANC 425	N/A
DANC 4320	DANC 432	N/A
DANC 4321	DANC 435	N/A
DANC 4610	DANC 447	N/A
DANC 4710	DANC 465	N/A
DANC 4990	DANC 411	N/A

DANC 4990	DANC 412	N/A
DANC 4990	DANC 413	N/A
DANC 4996	DANC 450	N/A
DANC 4997	DANC 499	N/A
DANC 5114	DANC 504	N/A
DANC 5130	DANC 523	N/A
DANC 5140	DANC 529	N/A
DANC 5142	DANC 510	N/A
DANC 5145	DANC 539	N/A
DANC 5150	DANC 526	N/A
DANC 5155	DANC 507	N/A
DANC 5157	DANC 512	N/A
DANC 5250	DANC 505	N/A
DANC 5251	DANC 506	N/A
DANC 5310	DANC 522	N/A
DANC 5311	DANC 525	N/A
DANC 5320	DANC 532	N/A
DANC 5321	DANC 535	N/A
DANC 5510	DANC 551	N/A
DANC 5550	DANC 566	N/A
DANC 5710	DANC 570	N/A
DANC 5900	DANC 599	N/A
DANC 5992	DANC 501	N/A
DANC 5996	DANC 550	N/A
DANC 5998	DANC 567	N/A
DANC 6998	DANC 670	N/A
ECED-EARLY CHILDHOOD EDUCATION		
ECED 1110	ECED 115	Common
ECED 1115	ECED 125	Common
ECED 1120	ECED 265	Common
ECED 1125	ECED 255	Common
ECED 1130	ECED 135	Common
ECED 2110	ECED 245	Common
ECED 2115	ECED 235	Common
ECED 2120	ECED 215	Common
ECED 2121	ECED 220	Common
ECED 2130	ECED 225	Common
ECED 2131	ECED 230	Common
ECED 2140	ECED 275	Common
ECED 2141	ECED 276	Common
ECED 2215	ECED 270	Common
ECED 2280	ECED 280	Common
ECED 2281	ECED 281	Unique
ECED 3110	ECED 325	N/A
ECED 3120	ECED 345	N/A
ECED 3210	ECED 351	N/A
ECED 3996	ECED 395	N/A
ECED 4110	SPED 450	N/A
ECED 4120	SPED 451	N/A
ECED 4210	ECED 420	N/A
ECED 4211	ECED 425	N/A
ECED 4220	ECED 465	N/A

ECED 4250	ECED 440	N/A
ECED 4260	ECED 455	N/A
ECED 4310	ECED 329	N/A
ECED 4320	RDG 350	N/A
ECED 4810	ECED 470	N/A
ECED 4996	ECED 489	N/A
ECED 4998	ECED 458	N/A
ECED 5110	SPED 550	N/A
ECED 5120	SPED 551	N/A
ECED 5130	ECED 515	N/A
ECED 5210	ECED 530	N/A
ECED 5220	ECED 570	N/A
ECED 5230	ECED 479	N/A
ECED 5310	ECED 510	N/A
ECED 5410	ECED 520	N/A
ECED 5420	ECED 540	N/A
ECED 5510	RDG 550	N/A
ECED 5520	RDG 551	N/A
ECED 5810	ECED 550	N/A
ECED 6110	ECED 612	N/A
ECED 6996	ECED 698	N/A
ECON-ECONOMICS		
ECON 1110G	ECON 201G	Common
ECON 2110G	ECON 251G	Common
ECON 2110H	ECON 251GH	Common
ECON 2120G	ECON 252G	Common
ECON 2120H	ECON 252GH	Common
EDLT-EDUCATION		
EDLT 2110	EDLT 268	Unique
EDLT 3110	EDLT 368	N/A
EDLT 5110	EDLT 528	N/A
EDLT 5120	EDLT 520	N/A
EDLT 5130	EDLT 522	N/A
EDLT 5140	EDLT 560	N/A
EDLT 5210	EDLT 561	N/A
EDLT 5220	EDLT 573	N/A
EDLT 5230	EDLT 575	N/A
EDLT 5240	EDLT 577	N/A
EDLT 5250	EDLT 580	N/A
EDLT 5310	EDLT 578	N/A
EDLT 5320	EDLT 579	N/A
EDLT 5330	EDLT 581	N/A
EDLT 5992	EDLT 592	N/A
EDLT 5999	EDLT 590	N/A
EDLT 6110	EDLT 628	N/A
EDLT 6120	EDLT 672	N/A
EDLT 6210	EDLT 607	N/A
EDLT 6220	EDLT 620	N/A
EDLT 6230	EDLT 610	N/A
EDLT 6240	EDLT 677	N/A
EDLT 6998	EDLT 612	N/A
EDUC-EDUCATION		

EDUC 1110	EDUC 101	Unique
EDUC 1120	EDUC 250	Common
EDUC 1140	EDUC 150	Unique
EDUC 1150	EDUC 151	Unique
EDUC 1185	EDUC 281	Unique
EDUC 1995	EDUC 181	Unique
EDUC 1996	EDUC 195	Unique
EDUC 1998	EDUC 102	Unique
EDUC 2710	EDUC 219	Unique
EDUC 2998	EDUC 202	Unique
EDUC 3110V	EDUC 317	N/A
EDUC 3120	EDUC 315	N/A
EDUC 3220	EDUC 343	N/A
EDUC 3996	EDUC 395	N/A
EDUC 3997	EDUC 381	N/A
EDUC 4310	EDUC 451	N/A
EDUC 4320	EDUC 452	N/A
EDUC 4330	EDUC 454	N/A
EDUC 4410	EDUC 463	N/A
EDUC 4420	EDUC 462	N/A
EDUC 4430	EDUC 461	N/A
EDUC 4440	EDUC 460	N/A
EDUC 4510	EDUC 402	N/A
EDUC 4520	EDUC 475	N/A
EDUC 4530	EDUC 476	N/A
EDUC 4810	EDUC 470	N/A
EDUC 4811	EDUC 481	N/A
EDUC 4820	EDUC 471	N/A
EDUC 4821	EDUC 482	N/A
EDUC 4992	EDUC 495	N/A
EDUC 4996	EDUC 489	N/A
EDUC 5110	EDUC 530	N/A
EDUC 5120	EDUC 515	N/A
EDUC 5130	EDUC 518	N/A
EDUC 5140	EDUC 519	N/A
EDUC 5150	EDUC 505	N/A
EDUC 5160	EDUC 516	N/A
EDUC 5170	EDUC 520	N/A
EDUC 5210	EDUC 542	N/A
EDUC 5220	EDUC 543	N/A
EDUC 5310	EDUC 551	N/A
EDUC 5320	EDUC 552	N/A
EDUC 5330	EDUC 554	N/A
EDUC 5410	EDUC 563	N/A
EDUC 5420	EDUC 562	N/A
EDUC 5430	EDUC 561	N/A
EDUC 5440	EDUC 560	N/A
EDUC 5510	EDUC 573	N/A
EDUC 5520	EDUC 571	N/A
EDUC 5530	EDUC 572	N/A
EDUC 5540	EDUC 577	N/A
EDUC 5810	EDUC 510	N/A

EDUC 5811	EDUC 509	N/A
EDUC 5990	EDUC 5999	N/A
EDUC 5991	EDUC 598	N/A
EDUC 5992	EDUC 595	N/A
EDUC 5996	EDUC 501	N/A
EDUC 5997	EDUC 5999	N/A
EDUC 5998	EDUC 558	N/A
EDUC 6110	EDUC 603	N/A
EDUC 6120	EDUC 604	N/A
EDUC 6210	EDUC 623	N/A
EDUC 6220	EDUC 633	N/A
EDUC 6230	EDUC 634	N/A
EDUC 6310	EDUC 635	N/A
EDUC 6320	EDUC 637	N/A
EDUC 6330	EDUC 630	N/A
EDUC 6410	EDUC 607	N/A
EDUC 6420	EDUC 613	N/A
EDUC 6430	EDUC 636	N/A
EDUC 6440	EDUC 606	N/A
EDUC 6910	EDUC 694	N/A
EDUC 6990	EDUC 685	N/A
EDUC 6991	EDUC 600	N/A
EDUC 6996	EDUC 698	N/A
EDUC 6997	EDUC 605	N/A
EDUC 6998	EDUC 602	N/A
EDUC 6999	EDUC 699	N/A
EDUC 7000	EDUC 700	N/A
ELAD-EDUC LEADERSHIP & ADMIN		
ELAD 2210	ELA 255	Unique
ELAD 2340	ELA 215	Unique
ELAD 2996	ELA 298	Unique
ELAD 3110V	ELAD 350V	N/A
ELAD 3210	ELAD 342	N/A
ELAD 3996	ELAD 398	N/A
ELAD 4110	ELAD 440	N/A
ELAD 4120	ELAD 450	N/A
ELAD 4130	ELAD 455	N/A
ELAD 4410	ELAD 411	N/A
ELAD 4420	ELAD 412	N/A
ELAD 4510	ELAD 485	N/A
ELAD 4998	ELAD 499	N/A
ELAD 5110	ELAD 575	N/A
ELAD 5120	ELAD 578	N/A
ELAD 5130	ELAD 590	N/A
ELAD 5140	ELAD 576	N/A
ELAD 5150	ELAD 579	N/A
ELAD 5160	ELAD 530	N/A
ELAD 5170	ELAD 531	N/A
ELAD 5180	ELAD 564	N/A
ELAD 5185	ELAD 565	N/A
ELAD 5210	ELAD 582	N/A
ELAD 5215	ELAD 563	N/A

ELAD 5220	ELAD 520	N/A
ELAD 5230	ELAD 555	N/A
ELAD 5240	ELAD 540	N/A
ELAD 5250	ELAD 550	N/A
ELAD 5260	ELAD 580	N/A
ELAD 5270	ELAD 569	N/A
ELAD 5280	ELAD 566	N/A
ELAD 5285	ELAD 567	N/A
ELAD 5310	ELAD 586	N/A
ELAD 5320	ELAD 570	N/A
ELAD 5410	ELAD 511	N/A
ELAD 5510	ELAD 585	N/A
ELAD 5992	ELAD 502	N/A
ELAD 5996	ELAD 595	N/A
ELAD 5997	ELAD 598	N/A
ELAD 6110	ELAD 615	N/A
ELAD 6120	ELAD 685	N/A
ELAD 6210	ELAD 622	N/A
ELAD 6220	ELAD 623	N/A
ELAD 6310	ELAD 630	N/A
ELAD 6320	ELAD 671	N/A
ELAD 6410	ELAD 682	N/A
ELAD 6510	ELAD 683	N/A
ELAD 6520	ELAD 679	N/A
ELAD 6525	ELAD 650	N/A
ELAD 6610	ELAD 635	N/A
ELAD 6620	ELAD 689	N/A
ELAD 6630	ELAD 676	N/A
ELAD 6635	ELAD 655	N/A
ELAD 6710	ELAD 645	N/A
ELAD 6910	ELAD 693	N/A
ELAD 6991	ELAD 600	N/A
ELAD 6996	ELAD 698	N/A
ELAD 6998	ELAD 670	N/A
ELAD 7000	ELAD 700	N/A
ENGL-ENGLISH		
ENGL 1105M	SPCD 1110	Unique
ENGL 1110G	ENGL 111G	Common
ENGL 1110H	ENGL 111GH	Unique
ENGL 1110M	ENGL 111 M	Unique
ENGL 1120	ENGL 112	Common
ENGL 1410G	ENGL 115G	Common
ENGL 2130G	ENGL 311G	Common
ENGL 2210G	ENGL 203G	Common
ENGL 2210G	ENGL 218G	Common
ENGL 2215G	ENGL 318G	Unique
ENGL 2221G	ENGL 211G	Unique
ENGL 2280	ENGL 263	Unique
ENGL 2310G	ENGL 220G	Common
ENGL 2381	ENGL 232	Unique
ENGL 2382	ENGL 235	Unique
ENGL 2520G	ENGL 116G	Common

ENGL 2521	ENGL 243	Unique
ENGL 2610	ENGL 251	Common
ENGL 2620	ENGL 252	Common
ENGL 2630	ENGL 271	Common
ENGL 2640	ENGL 272	Common
ENGL 2650G	ENGL 244G	Common
ENGL 2996	ENGL 299	Unique
ENTR-ENTREPRENEURSHIP		
ENTR 1110	BMGT 275	Common
ENVS-ENVIRONMENTAL SCIENCE		
ENVS 1110G	E S 110G	Common
ENVS 2111	E S 256	Unique
ENVS 2111L	E S 256 L	Unique
ENVS 300	E S 300	N/A
ENVS 301	E S 301	N/A
ENVS 312	E S 312	N/A
ENVS 361	E S 361	N/A
ENVS 370	E S 370	N/A
ENVS 391	E S 391	N/A
ENVS 422	E S 422	N/A
ENVS 449	E S 449	N/A
ENVS 451	E S 451	N/A
ENVS 452	E S 452	N/A
ENVS 457	E S 457	N/A
ENVS 460	E S 460	N/A
ENVS 462	E S 462	N/A
ENVS 470	E S 470	N/A
ENVS 471	E S 471	N/A
ENVS 557	E S 557	N/A
ENVS 596	E S 596	N/A
ENVS 599	E S 599	N/A
ENVS 605	E S 605	N/A
ENVS 696	E S 696	N/A
ENVS 700	E S 700	N/A
EPWS-ENTMLGY/PLNT PTHLGY/WD SCI		
EPWS 1110	EPWS 100	Unique
EPWS 1110L	EPWS 100 L	Unique
EPWS 2996	EPWS 200	Unique
FCSC-FAMILY & CONSUMER SCI		
FCSC 2250	FCSE 245	Unique
FCSC 2330	FCSE 235	Unique
FCSC 345	FCSE 345	N/A
FCSC 348	FCSE 348	N/A
FCSC 445	FCSE 445	N/A
FCSC 446	FCSE 446	N/A
FCSC 447	FCSE 447	N/A
FCSC 448	FCSE 448	N/A
FCSC 492	FCSE 492	N/A
FCSC 545	FCSE 545	N/A
FCSC 546	FCSE 546	N/A
FCSC 547	FCSE 547	N/A
FCSC 548	FCSE 548	N/A

FCSC 590	FCSE 590	N/A
FCST-FAMILY AND CHILD STUDIES		
FCST 1130	FCS 181	Unique
FCST 2110	FCS 210	Unique
FCST 2135	FCS 212	Unique
FCST 2140	FCS 213	Unique
FCST 300	FCS 300	N/A
FCST 301	FCS 301	N/A
FCST 380	FCS 380	N/A
FCST 383	FCS 383	N/A
FCST 424	FCS 424	N/A
FCST 449V	FCS 449V	N/A
FCST 456	FCS 456	N/A
FCST 492	FCS 492	N/A
FCST 510	FCS 510	N/A
FCST 511	FCS 511	N/A
FCST 512	FCS 512	N/A
FCST 524	FCS 524	N/A
FCST 525	FCS 525	N/A
FCST 548	FCS 548	N/A
FCST 549	FCS 549	N/A
FCST 562	FCS 562	N/A
FCST 572	FCS 572	N/A
FCST 582	FCS 582	N/A
FCST 583	FCS 583	N/A
FCST 584	FCS 584	N/A
FCST 585	FCS 585	N/A
FCST 586	FCS 586	N/A
FCST 587	FCS 587	N/A
FCST 589	FCS 589	N/A
FCST 590	FCS 590	N/A
FCST 592	FCS 592	N/A
FCST 598	FCS 598	N/A
FCST 599	FCS 599	N/A
FDMA-FILM & DIGITAL MEDIA		
FDMA 1110	CMT 170	Common
FDMA 1120	CMT 140	Common
FDMA 1210	CMT 190	Common
FDMA 1220	CMI 216	Common
FDMA 1220	CMT 195	Common
FDMA 1260	CMT 108	Common
FDMA 1260	CMT 120	Common
FDMA 1360	CMT 130	Common
FDMA 1410	CMT 247	Common
FDMA 1415	CMT 206	Unique
FDMA 1510	CMI 260	Common
FDMA 1510	CMT 135	Common
FDMA 1515	CMT 145	Common
FDMA 1531	CMT 151	Unique
FDMA 1535	CMT 142	Common
FDMA 1536	CMT 242	Unique
FDMA 1545	CMT 115	Common

FDMA 1555	CMI 100	Unique
FDMA 1630	CMT 180	Common
FDMA 1710	CMT 150	Unique
FDMA 1715	CMI 245	Unique
FDMA 1720	CMT 175	Unique
FDMA 1996	CMT 155	Unique
FDMA 2111	CMT 220	Unique
FDMA 2120	CMT 126	Common
FDMA 2125	CMT 156	Common
FDMA 2150	CMT 240	Common
FDMA 2210	CMT 210	Unique
FDMA 2241	CMT 258	Unique
FDMA 2285	CMT 215	Common
FDMA 2287	CMT 223	Common
FDMA 2310	CMI 228	Unique
FDMA 2311	CMI 231	Unique
FDMA 2311	CMT 253	Unique
FDMA 2312	CMT 254	Unique
FDMA 2325	CMT 245	Common
FDMA 2326	CMT 216	Unique
FDMA 2360	CMT 230	Common
FDMA 2365	CMT 235	Unique
FDMA 2370	CMT 275	Unique
FDMA 2381	CMI 232	Unique
FDMA 2382	CMI 235	Unique
FDMA 2410	CMT 236	Common
FDMA 2510	CMI 200	Common
FDMA 2520	CMI 205	Common
FDMA 2520	CMT 205	Common
FDMA 2530	CMI 280	Common
FDMA 2530	CMT 160	Common
FDMA 2535	CMI 240	Unique
FDMA 2570	CMT 292	Unique
FDMA 2710	CMI 250	Unique
FDMA 2715	CMT 260	Unique
FDMA 2720	CMI 290	Unique
FDMA 2725	CMI 270	Unique
FDMA 2730	CMT 227	Unique
FDMA 2735	CMT 290	Unique
FDMA 2740	CMT 291	Unique
FDMA 2745	CMI 233	Unique
FDMA 2750	CMT 229	Unique
FDMA 2755	CMI 220	Unique
FDMA 2770	CMT 200	Unique
FDMA 2775	CMT 252	Unique
FDMA 2785	CMT 228	Unique
FDMA 2993	CMT 276	Unique
FDMA 2994	CMT 295	Unique
FDMA 2995	CMT 226	Unique
FDMA 2996	CMT 255	Unique
FDMA 2997	CMT 298	Unique
FDMA 2998	CMT 221	Unique

FDMA 300	CMI 300	N/A
FDMA 301	CMI 301	N/A
FDMA 303	CMI 303	N/A
FDMA 305	CMI 305	N/A
FDMA 308	CMI 308	N/A
FDMA 309	CMI 309	N/A
FDMA 310	CMI 310	N/A
FDMA 311	CMI 311	N/A
FDMA 312	CMI 312	N/A
FDMA 314	CMI 314	N/A
FDMA 315	CMI 315	N/A
FDMA 316	CMI 316	N/A
FDMA 318	CMI 318	N/A
FDMA 320	CMI 320	N/A
FDMA 325	CMI 325	N/A
FDMA 328	CMI 328	N/A
FDMA 332	CMI 332	N/A
FDMA 341	CMI 341	N/A
FDMA 348	CMI 348	N/A
FDMA 350	CMI 350	N/A
FDMA 360	CMI 360	N/A
FDMA 362	CMI 362	N/A
FDMA 365	CMI 365	N/A
FDMA 377	CMI 377	N/A
FDMA 395	CMI 395	N/A
FDMA 396	CMI 396	N/A
FDMA 397	CMI 397	N/A
FDMA 398	CMI 398	N/A
FDMA 400	CMI 400	N/A
FDMA 401	CMI 401	N/A
FDMA 410	CMI 410	N/A
FDMA 412	CMI 412	N/A
FDMA 420	CMI 420	N/A
FDMA 425	CMI 425	N/A
FDMA 433	CMI 433	N/A
FDMA 450	CMI 450	N/A
FDMA 470	CMI 470	N/A
FDMA 477	CMI 477	N/A
FDMA 480	CMI 480	N/A
FDMA 490	CMI 490	N/A
FDMA 491	CMI 491	N/A
FDMA 492	CMI 492	N/A
FDMA 493	CMI 493	N/A
FDMA 494	CMI 494	N/A
FDMA 495	CMI 495	N/A
FDMA 497	CMI 497	N/A
FREN-FRENCH		
FREN 1110	FREN 111	Common
FREN 1120	FREN 112	Common
FREN 2110	FREN 211	Common
FREN 2120	FREN 212	Common
FSTE-FOOD SCIENCE & TECHNOLOGY		

FSTE 1120	FSTE 175	Unique
FSTE 2110G	FSTE 263G	Unique
FSTE 2120	FSTE 275	Unique
FSTE 2130G	FSTE 210G	Unique
FSTE 2996	FSTE 200	Unique
FWCE-FISH,WILDLF,CONSERV ECOL		
FWCE 1110G	FWCE 110G	Unique
FWCE 1120	FWCE 109	Unique
FWCE 2110	FWCE 255	Unique
FYEX-FIRST YEAR EXPERIENCE		
FYEX 1110	COLL 101	Common
FYEX 1112	UNIV 150	Unique
FYEX 1116	COLL 103	Unique
FYEX 1117	UNIV 114	Unique
FYEX 1131	UNIV 110	Unique
FYEX 1132	UNIV 112	Unique
FYEX 1133	COLL 108	Unique
FYEX 1134	UNIV 113	Unique
FYEX 1140	COLL 120	Unique
FYEX 1160	UNIV 101	Unique
FYEX 1170	UNIV 161	Unique
FYEX 1995	UNIV 116	Unique
FYEX 1996	COLL 155	Unique
FYEX 2111	COLL 201	Unique
FYEX 2994	COLL 185	Unique
GENE-GENETICS		
GENE 1110	GENE 110	Unique
GEOG-GEOGRAPHY		
GEOG 1110G	GEOG 111G	Common
GEOG 1120G	GEOG 112G	Common
GEOG 1130G	GEOG 120G	Common
GEOG 2130	GEOG 281	Unique
GEOG 2996	GEOG 291	Unique
GEOL-GEOLOGY		
GEOL 1110G	GEOL 111G	Common
GEOL 2130	GEOG 257	Common
GEOL 2996	GEOL 220	Unique
GNDR-WOMEN'S STUDIES		
GNDR 2110G	W S 201G	Common
GNDR 2120G	HON 218	Unique
GNDR 2120G	W S 202G	Unique
GNDR 350	W S 350	N/A
GNDR 359	W S 359	N/A
GNDR 360	W S 360	N/A
GNDR 380V	W S 380V	N/A
GNDR 381V	W S 381V	N/A
GNDR 401	W S 401	N/A
GNDR 402	W S 402	N/A
GNDR 403	W S 403	N/A
GNDR 405	W S 405	N/A
GNDR 406	W S 406	N/A
GNDR 407	W S 407	N/A

GNDR 408	W S 408	N/A
GNDR 411	W S 411	N/A
GNDR 412	W S 412	N/A
GNDR 433V	W S 433V	N/A
GNDR 450	W S 450	N/A
GNDR 451	W S 451	N/A
GNDR 453	W S 453	N/A
GNDR 454	W S 454	N/A
GNDR 455	W S 455	N/A
GNDR 461	W S 461	N/A
GNDR 465	W S 465	N/A
GNDR 471	W S 471	N/A
GNDR 474	W S 474	N/A
GNDR 482	W S 482	N/A
GNDR 484	W S 484	N/A
GNDR 501	W S 501	N/A
GNDR 502	W S 502	N/A
GNDR 505	W S 505	N/A
GNDR 507	W S 507	N/A
GNDR 508	W S 508	N/A
GNDR 511	W S 511	N/A
GNDR 512	W S 512	N/A
GNDR 533	W S 533	N/A
GNDR 550	W S 550	N/A
GNDR 554	W S 554	N/A
GNDR 555	W S 555	N/A
GNDR 561	W S 561	N/A
GNDR 565	W S 565	N/A
GNDR 571	W S 571	N/A
GNDR 582	W S 582	N/A
GNDR 584	W S 584	N/A
GRMN-GERMAN		
GRMN 1110	GER 111	Common
GRMN 1120	GER 112	Common
GRMN 2110	GER 211	Common
GRMN 2120	GER 212	Common
GRMN 305	GER 305	N/A
GRMN 313	GER 313	N/A
GRMN 325	GER 325	N/A
GRMN 330	GER 330	N/A
GRMN 333V	GER 333V	N/A
GRMN 340	GER 340	N/A
GRMN 341	GER 341	N/A
GRMN 343	GER 343	N/A
GRMN 350	GER 350	N/A
GRMN 399	GER 399	N/A
GRMN 410	GER 410	N/A
GRMN 413	GER 413	N/A
GRMN 425	GER 425	N/A
GRMN 451	GER 451	N/A
GRMN 453	GER 453	N/A
GRMN 471	GER 471	N/A

HIST-HISTORY

HIST 1105G	HIST 110G	Unique
HIST 1110G	HIST 201G	Common
HIST 1120G	HIST 202G	Common
HIST 1130G	HIST 111G	Common
HIST 1140G	HIST 112G	Common
HIST 1150G	HIST 101G	Common
HIST 1160G	HIST 102G	Common
HIST 2110	HIST 261	Common
HIST 2245G	HIST 221G	Unique
HIST 2246G	HIST 222G	Unique
HIST 2250G	HIST 211G	Unique
HIST 2251G	HIST 212G	Unique
HIST 2996	HIST 269	Unique

HMSV-HUMAN SERVICES

HMSV 2110	S WK 253	Common
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HNRS-HONORS

HNRS 1110	HON 115	Unique
HNRS 2110G	HON 210	Unique
HNRS 2111	HON 214	Unique
HNRS 2114G	HON 208G	Unique
HNRS 2115G	HON 216G	Unique
HNRS 2116G	HON 219G	Unique
HNRS 2117G	HON 220G	Unique
HNRS 2120G	HON 222G	Unique
HNRS 2140G	HON 227G	Unique
HNRS 2141G	HON 230G	Unique
HNRS 2150G	HON 228G	Unique
HNRS 2160G	HON 229G	Unique
HNRS 2161G	HON 235G	Unique
HNRS 2170G	HON 232G	Unique
HNRS 2171G	HON 234G	Unique
HNRS 2172G	HON 237G	Unique
HNRS 2173G	HON 239G	Unique
HNRS 2174G	HON 249G	Unique
HNRS 2175G	HON 265G	Unique
HNRS 2178G	HON 270G	Unique
HNRS 2180G	HON 248G	Unique
HNRS 2185G	HON 211	Unique
HNRS 2190G	HON 242G	Unique
HNRS 2996	HON 221	Unique
HNRS 304V	HON 304V	N/A
HNRS 306V	HON 306V	N/A
HNRS 313	HON 313	N/A
HNRS 314	HON 314	N/A
HNRS 317V	HON 317V	N/A
HNRS 318V	HON 318V	N/A
HNRS 321V	HON 321V	N/A
HNRS 324V	HON 324V	N/A
HNRS 326V	HON 326V	N/A
HNRS 328V	HON 328V	N/A
HNRS 335V	HON 335V	N/A

HNRS 340V	HON 340V	N/A
HNRS 341V	HON 341V	N/A
HNRS 347V	HON 347V	N/A
HNRS 348V	HON 348V	N/A
HNRS 349V	HON 349V	N/A
HNRS 353V	HON 353V	N/A
HNRS 362V	HON 362V	N/A
HNRS 370V	HON 370V	N/A
HNRS 371V	HON 371V	N/A
HNRS 374V	HON 374V	N/A
HNRS 378V	HON 378V	N/A
HNRS 379V	HON 379V	N/A
HNRS 381V	HON 381V	N/A
HNRS 384V	HON 384V	N/A
HNRS 387V	HON 387V	N/A
HNRS 388V	HON 388V	N/A
HNRS 390V	HON 390V	N/A
HNRS 394V	HON 394V	N/A
HNRS 400	HON 400	N/A
HNRS 410	HON 410	N/A
HNRS 411V	HON 411V	N/A
HNRS 412	HON 412	N/A
HNRS 413	HON 413	N/A
HNRS 420	HON 420	N/A
HNRS 421	HON 421	N/A
HNRS 422	HON 422	N/A
HNRS 425V	HON 425V	N/A
HNRS 450V	HON 450V	N/A
HNRS 521	HON 521	N/A
HORT-HORTICULTURE		
HORT 1115G	HORT 100G	Unique
HORT 2110	HORT 210	Unique
HORT 2120	HORT 211	Unique
HORT 2130	HORT 240	Unique
HORT 2160	HORT 250	Unique
HORT 2990	HORT 241	Unique
HORT 2996	HORT 200	Unique
HRTM-HOTEL/RESTRNT/TOURISM MGT		
HRTM 1120G	HRTM 201	Unique
HRTM 1130	HRTM 221	Unique
HRTM 2110	HRTM 231	Unique
HRTM 2120	HRTM 263	Unique
HRTM 2130	HRTM 235	Unique
HRTM 2996	HRTM 200	Unique
JAPN-JAPANESE		
JAPN 1110	JPNS 111	Common
JAPN 1120	JPNS 112	Common
JAPN 2110	JPNS 211	Common
JAPN 2120	JPNS 212	Common
JAPN 320	JPNS 320	N/A
JAPN 453	JPNS 453	N/A
LIBR-LIBRARY SCIENCE		

LIBR 1110	LIB 101	Unique
LIBR 1111	LIB 111	Unique
LIBR 311V	LIB 311V	N/A
LING-LINGUISTICS		
LING 2110G	LING 200G	Common
MATH-MATHEMATICS		
MATH 1130G	MATH 210G	Common
MATH 1134	MATH 111	Unique
MATH 1215	MATH 120	Common
MATH 1217	MATH 101	Unique
MATH 1220G	MATH 121G	Common
MATH 1221	MATH 102	Unique
MATH 1250G	MATH 190G	Common
MATH 1350G	A ST 251G	Common
MATH 1350G	STAT 251G	Common
MATH 1430G	MATH 142G	Common
MATH 1435	MATH 235	Common
MATH 1440	MATH 236	Common
MATH 1511G	MATH 191G	Unique
MATH 1521G	MATH 192G	Unique
MATH 1521H	MATH 192GH	Unique
MATH 1531	MATH 279	Unique
MATH 1996	MATH 107	Unique
MATH 2134G	MATH 112G	Unique
MATH 2234	MATH 215	Unique
MATH 2350G	STAT 271G	Common
MATH 2415	MATH 280	Unique
MATH 2530G	MATH 291G	Common
MATH 2992	MATH 200	Unique
MGMT-MANAGEMENT		
MGMT 2110	MGT 201	Common
MGMT 309	MGT 309	N/A
MGMT 310V	MGT 310V	N/A
MGMT 315V	MGT 315V	N/A
MGMT 332	MGT 332	N/A
MGMT 333	MGT 333	N/A
MGMT 335V	MGT 335V	N/A
MGMT 344	MGT 344	N/A
MGMT 347	MGT 347	N/A
MGMT 351	MGT 351	N/A
MGMT 361	MGT 361	N/A
MGMT 375V	MGT 375V	N/A
MGMT 388V	MGT 388V	N/A
MGMT 391	MGT 391	N/A
MGMT 448	MGT 448	N/A
MGMT 449	MGT 449	N/A
MGMT 451	MGT 451	N/A
MGMT 453	MGT 453	N/A
MGMT 454	MGT 454	N/A
MGMT 458	MGT 458	N/A
MGMT 460	MGT 460	N/A
MGMT 461	MGT 461	N/A

MGMT 465	MGT 465	N/A
MGMT 470	MGT 470	N/A
MGMT 490	MGT 490	N/A
MGMT 491	MGT 491	N/A
MGMT 498	MGT 498	N/A
MGMT 502	MGT 502	N/A
MGMT 503	MGT 503	N/A
MGMT 512	MGT 512	N/A
MGMT 527	MGT 527	N/A
MGMT 548	MGT 548	N/A
MGMT 590	MGT 590	N/A
MGMT 591	MGT 591	N/A
MGMT 598	MGT 598	N/A
MGMT 600	MGT 600	N/A
MGMT 601	MGT 601	N/A
MGMT 640	MGT 640	N/A
MGMT 645	MGT 645	N/A
MGMT 650	MGT 650	N/A
MGMT 655	MGT 655	N/A
MGMT 660	MGT 660	N/A
MGMT 661	MGT 661	N/A
MGMT 670	MGT 670	N/A
MGMT 675	MGT 675	N/A
MGMT 685	MGT 685	N/A
MGMT 690	MGT 690	N/A
MGMT 698	MGT 698	N/A
MGMT 700	MGT 700	N/A
MKTG-MARKETING		
MKTG 2110	BMGT 210	Common
MKTG 2110	MKTG 203	Common
MUSC-MUSIC		
MUSC 351	MUS 351	N/A
MUSC 1110G	MUS 201G	Common
MUSC 1130G	MUS 101G	Common
MUSC 1210	MUS 102	Common
MUSC 1310	MUS 121	Common
MUSC 1410	MUS 250	Common
MUSC 1440	MUS 141	Unique
MUSC 1450	MUS 103	Unique
MUSC 1451	MUS 104	Unique
MUSC 1460	MUS 105	Unique
MUSC 1461	MUS 106	Unique
MUSC 1470	MUS 145	Unique
MUSC 1471	MUS 146	Unique
MUSC 1472	MUS 147	Unique
MUSC 1992	MUS 130	Common
MUSC 2110	MUS 164	Common
MUSC 2110	MUS 171	Common
MUSC 2120	MUS 151	Common
MUSC 2120	MUS 160	Common
MUSC 2120	MUS 161	Common
MUSC 2120	MUS 162	Common

MUSC 2120	MUS 170	Common
MUSC 2120	MUS 172	Common
MUSC 2120	MUS 180	Common
MUSC 2120	MUS 181	Common
MUSC 2130	MUS 163	Common
MUSC 2132	MUS 174	Unique
MUSC 2151	MUS 202	Unique
MUSC 2210	MUS 262	Common
MUSC 2220	MUS 263	Common
MUSC 2240	MUS 207	Unique
MUSC 2310	MUS 273	Common
MUSC 2451	MUS 203	Unique
MUSC 2452	MUS 204	Unique
MUSC 2460	MUS 205	Unique
MUSC 2461	MUS 206	Unique
MUSC 2470	MUS 261	Unique
MUSC 2510	MUS 230	Unique
MUSC 2993	MUS 251	Unique
MUSC 2996	MUS 260	Unique
MUSC 301	MUS 301	N/A
MUSC 302	MUS 302	N/A
MUSC 303	MUS 303	N/A
MUSC 315	MUS 315	N/A
MUSC 316	MUS 316	N/A
MUSC 317	MUS 317	N/A
MUSC 318	MUS 318	N/A
MUSC 319	MUS 319	N/A
MUSC 320	MUS 320	N/A
MUSC 321	MUS 321	N/A
MUSC 322	MUS 322	N/A
MUSC 323	MUS 323	N/A
MUSC 324	MUS 324	N/A
MUSC 325	MUS 325	N/A
MUSC 326	MUS 326	N/A
MUSC 327	MUS 327	N/A
MUSC 330	MUS 330	N/A
MUSC 339	MUS 339	N/A
MUSC 340	MUS 340	N/A
MUSC 341	MUS 341	N/A
MUSC 346	MUS 346	N/A
MUSC 349	MUS 349	N/A
MUSC 350	MUS 350	N/A
MUSC 360	MUS 360	N/A
MUSC 361	MUS 361	N/A
MUSC 362	MUS 362	N/A
MUSC 363	MUS 363	N/A
MUSC 365	MUS 365	N/A
MUSC 368	MUS 368	N/A
MUSC 370	MUS 370	N/A
MUSC 372	MUS 372	N/A
MUSC 374	MUS 374	N/A
MUSC 380	MUS 380	N/A

MUSC 381	MUS 381	N/A
MUSC 386	MUS 386	N/A
MUSC 390	MUS 390	N/A
MUSC 391	MUS 391	N/A
MUSC 392	MUS 392	N/A
MUSC 413	MUS 413	N/A
MUSC 415	MUS 415	N/A
MUSC 417	MUS 417	N/A
MUSC 421	MUS 421	N/A
MUSC 422	MUS 422	N/A
MUSC 424	MUS 424	N/A
MUSC 429	MUS 429	N/A
MUSC 430	MUS 430	N/A
MUSC 440	MUS 440	N/A
MUSC 441	MUS 441	N/A
MUSC 450	MUS 450	N/A
MUSC 455	MUS 455	N/A
MUSC 470	MUS 470	N/A
MUSC 471	MUS 471	N/A
MUSC 475	MUS 475	N/A
MUSC 477	MUS 477	N/A
MUSC 486	MUS 486	N/A
MUSC 498	MUS 498	N/A
MUSC 511	MUS 511	N/A
MUSC 513	MUS 513	N/A
MUSC 518	MUS 518	N/A
MUSC 519	MUS 519	N/A
MUSC 521	MUS 521	N/A
MUSC 522	MUS 522	N/A
MUSC 523	MUS 523	N/A
MUSC 527	MUS 527	N/A
MUSC 529	MUS 529	N/A
MUSC 530	MUS 530	N/A
MUSC 531	MUS 531	N/A
MUSC 535	MUS 535	N/A
MUSC 540	MUS 540	N/A
MUSC 574	MUS 574	N/A
MUSC 575	MUS 575	N/A
MUSC 576	MUS 576	N/A
MUSC 577	MUS 577	N/A
MUSC 578	MUS 578	N/A
MUSC 579	MUS 579	N/A
MUSC 580	MUS 580	N/A
MUSC 582	MUS 582	N/A
MUSC 586	MUS 586	N/A
MUSC 598	MUS 598	N/A
MUSC 599	MUS 599	N/A
NATV-NATV-NATIVE AMERICAN STUDIES		
NATV 3110V	ANTH 305V	N/A
NATV 3120	ANTH 454	N/A
NATV 4110	ANTH 453	N/A
NATV 4120V	ANTH 444	N/A

NATV 4130	ANTH 443	N/A
NATV 4210	ANTH 407	N/A
NATV 4220	ANTH 455	N/A
NATV 4310	ANTH 441	N/A
NATV 5120	ANTH 551	N/A
NATV 5210	ANTH 528	N/A
NMNEC-NURSING EDUC CONSORTIUM		
NMNC 3110	NURS 293	Common
NMNC 3120	NURS 362	Common
NMNC 3135	NURS 294	Common
NMNC 3210	NURS 377	Common
NMNC 3220	NURS 378	Common
NMNC 3230	NURS 379	Common
NMNC 3235	NURS 380	Common
NMNC 4310	NURS 395	Common
NMNC 4320	NURS 396	Common
NMNC 4335	NURS 398	Common
NMNC 4410	NURS 466	Common
NMNC 4435	NURS 467	Common
NMNC 4445	NURS 468	Common
NMNC 4510	NURS 486	Common
NMNC 4520	NURS 487	Common
NMNC 4535	NURS 488	Common
NMNC 4545	NURS 489	Common
NURS-NURSING		
NURS 1110	NURS 110	Unique
NURS 3110	NURS 328	N/A
NURS 3996	NURS 397	N/A
NURS 4110	NURS 460	N/A
NURS 4997	NURS 490	N/A
NURS 5110	NURS 507	N/A
NURS 5115	NURS 509	N/A
NURS 5120	NURS 567	N/A
NURS 5125	NURS 506	N/A
NURS 5130	NURS 530	N/A
NURS 5210	NURS 565	N/A
NURS 5220	NURS 549	N/A
NURS 5230	NURS 566	N/A
NURS 5240	NURS 595	N/A
NURS 5996	NURS 597	N/A
NURS 5997	NURS 590	N/A
NURS 6110	NURS 603	N/A
NURS 6120	NURS 651	N/A
NURS 6125	NURS 653	N/A
NURS 6130	NURS 685	N/A
NURS 6135	NURS 648	N/A
NURS 6210	NURS 697	N/A
NURS 6220	NURS 511	N/A
NURS 6230	NURS 512	N/A
NURS 6250	NURS 612	N/A
NURS 6255	NURS 649	N/A
NURS 6260	NURS 657	N/A

NURS 6265	NURS 642	N/A
NURS 6270	NURS 622	N/A
NURS 6305	NURS 679	N/A
NURS 6307	NURS 689	N/A
NURS 6310	NURS 686	N/A
NURS 6320	NURS 687	N/A
NURS 6330	NURS 688	N/A
NURS 6340	NURS 699	N/A
NURS 6350	NURS 678	N/A
NURS 6405	NURS 514	N/A
NURS 6410	NURS 660	N/A
NURS 6420	NURS 662	N/A
NURS 6430	NURS 664	N/A
NURS 6450	NURS 665	N/A
NURS 6505	NURS 676	N/A
NURS 6510	NURS 671	N/A
NURS 6520	NURS 672	N/A
NURS 6530	NURS 673	N/A
NURS 6990	NURS 698	N/A
NURS 6993	NURS 690	N/A
NURS 6997	NURS 691	N/A
NURS 7000	NURS 700	N/A
NUTR-NUTRITION		
NUTR 2110	HNDS 251	Common
NUTR 2120	HNDS 201	Unique
NUTR 3110	HNDS 350	N/A
NUTR 3120	HNDS 360	N/A
NUTR 3750	HNDS 440	N/A
NUTR 3996	HNDS 450	N/A
NUTR 4110	HNDS 448	N/A
NUTR 4210	HNDS 403	N/A
NUTR 4220	HNDS 430	N/A
NUTR 4230	HNDS 446	N/A
NUTR 4230L	HNDS 446 L	N/A
NUTR 4233	HNDS 420	N/A
NUTR 4235	HNDS 405	N/A
NUTR 4240	HNDS 449	N/A
NUTR 4240L	HNDS 449 L	N/A
NUTR 4550	HNDS 455	N/A
NUTR 4560	HNDS 401	N/A
NUTR 4565	HNDS 407	N/A
NUTR 4991	HNDS 492	N/A
NUTR 5110	HNDS 548	N/A
NUTR 5150	HNDS 500	N/A
NUTR 5210	HNDS 551	N/A
NUTR 5220	HNDS 530	N/A
NUTR 5230	HNDS 546	N/A
NUTR 5233	HNDS 520	N/A
NUTR 5240	HNDS 549	N/A
NUTR 5610	HNDS 560	N/A
NUTR 5620	HNDS 562	N/A
NUTR 5630	HNDS 563	N/A

NUTR 5640	HNDS 564	N/A
NUTR 5650	HNDS 565	N/A
NUTR 5660	HNDS 566	N/A
NUTR 5670	HNDS 567	N/A
NUTR 5680	HNDS 568	N/A
NUTR 5991	HNDS 598	N/A
NUTR 5996	HNDS 590	N/A
OATS- OFFICE ADMIN TECH SYSTEMS		
OATS 101	BOT 101	N/A
OATS 102	BOT 102	N/A
OATS 105	BOT 105	N/A
OATS 106	BOT 106	N/A
OATS 110	BOT 110	N/A
OATS 120	BOT 120	N/A
OATS 121	BOT 121	N/A
OATS 140	BOT 140	N/A
OATS 150	BOT 150	N/A
OATS 169	BOT 169	N/A
OATS 170	BOT 170	N/A
OATS 171	BOT 171	N/A
OATS 191	BOT 191	N/A
OATS 202	BOT 202	N/A
OATS 203	BOT 203	N/A
OATS 205	BOT 205	N/A
OATS 206	BOT 206	N/A
OATS 207	BOT 207	N/A
OATS 208	BOT 208	N/A
OATS 209	BOT 209	N/A
OATS 211	BOT 211	N/A
OATS 213	BOT 213	N/A
OATS 214	BOT 214	N/A
OATS 215	BOT 215	N/A
OATS 217	BOT 217	N/A
OATS 218	BOT 218	N/A
OATS 220	BOT 220	N/A
OATS 221	BOT 221	N/A
OATS 222	BOT 222	N/A
OATS 223	BOT 223	N/A
OATS 228	BOT 228	N/A
OATS 233	BOT 233	N/A
OATS 239	BOT 239	N/A
OATS 240	BOT 240	N/A
OATS 241	BOT 241	N/A
OATS 244	BOT 244	N/A
OATS 250	BOT 250	N/A
OATS 255	BOT 255	N/A
OATS 260	BOT 260	N/A
OATS 270	BOT 270	N/A
PHED-PHYSICAL EDUCATION		
HLED 1154	P E 134	Common
PHED 1110	P E 128	Common
PHED 1230	P E 147	Common

PHED 1230	P E 148	Common
PHED 1230	P E 150	Common
PHED 1290	P E 112	Common
PHED 1290	P E 113	Common
PHED 1290	P E 114	Common
PHED 1290	P E 115	Common
PHED 1290	P E 117	Common
PHED 1290	P E 166	Common
PHED 1310	P E 130	Common
PHED 1320	P E 131	Common
PHED 1410	P E 199	Common
PHED 1430	P E 109	Common
PHED 1510	P E 102	Common
PHED 1510	P E 103	Common
PHED 1510	P E 127	Common
PHED 1620	P E 205	Common
PHED 1630	P E 104	Common
PHED 1670	P E 129	Common
PHED 1710	P E 154	Common
PHED 1710	P E 159	Common
PHED 1830	P E 173	Common
PHED 1910	P E 263	Common
PHED 2996	P E 270	Common
PHIL-PHILOSOPHY		
PHIL 1115G	PHIL 101G	Common
PHIL 1120G	PHIL 211G	Common
PHIL 1140G	PHIL 136G	Unique
PHIL 1145G	PHIL 100G	Unique
PHIL 1155G	PHIL 124G	Unique
PHIL 2110G	PHIL 223G	Common
PHIL 2230G	PHIL 201G	Common
PHLS-PUBLIC HEALTH SCIENCES		
PHLS 1110G	PHLS 150G	Common
PHLS 2110	PHLS 275	Common
PHLS 2120	PHLS 295	Common
PHLS 3110V	PHLS 301V	N/A
PHLS 3120V	PHLS 380V	N/A
PHLS 3130V	PHLS 305V	N/A
PHLS 3210	PHLS 375	N/A
PHLS 3220	PHLS 395	N/A
PHLS 4130	PHLS 452	N/A
PHLS 4210	PHLS 475	N/A
PHLS 4310	PHLS 451	N/A
PHLS 4320	PHLS 450	N/A
PHLS 4410	PHLS 457	N/A
PHLS 4420	PHLS 473	N/A
PHLS 4430	PHLS 476	N/A
PHLS 4440	PHLS 478	N/A
PHLS 4510	PHLS 497	N/A
PHLS 4515	PHLS 499	N/A
PHLS 4610	PHLS 461	N/A
PHLS 4620V	PHLS 464V	N/A

PHLS 4630	PHLS 465	N/A
PHLS 4640	PHLS 467	N/A
PHLS 4650	PHLS 468	N/A
PHLS 4660	PHLS 469	N/A
PHLS 4710	GERO 415	N/A
PHLS 4720	GERO 450	N/A
PHLS 4730	GERO 493	N/A
PHLS 4740	GERO 451	N/A
PHLS 4810	PHLS 459	N/A
PHLS 4820	PHLS 471	N/A
PHLS 4996	PHLS 486	N/A
PHLS 4997	PHLS 490	N/A
PHLS 4998	PHLS 496	N/A
PHLS 5110	MPH 510	N/A
PHLS 5120	MPH 520	N/A
PHLS 5130	MPH 530	N/A
PHLS 5140	MPH 540	N/A
PHLS 5150	MPH 550	N/A
PHLS 5210	MPH 570	N/A
PHLS 5220	MPH 572	N/A
PHLS 5230	MPH 573	N/A
PHLS 5240	MPH 574	N/A
PHLS 5250	MPH 578	N/A
PHLS 5260	MPH 579	N/A
PHLS 5310	MPH 541	N/A
PHLS 5320	MPH 545	N/A
PHLS 5330	MPH 546	N/A
PHLS 5340	MPH 547	N/A
PHLS 5160	PHLS 5350	N/A
PHLS 5610	MPH 561	N/A
PHLS 5620	MPH 564	N/A
PHLS 5630	MPH 565	N/A
PHLS 5635	MPH 566	N/A
PHLS 5640	MPH 567	N/A
PHLS 5650	MPH 568	N/A
PHLS 5660	MPH 569	N/A
PHLS 5670	MPH 560	N/A
PHLS 5710	MPH 515	N/A
PHLS 5720	MPH 557	N/A
PHLS 5730	MPH 593	N/A
PHLS 5810	MPH 559	N/A
PHLS 5820	MPH 571	N/A
PHLS 5830	MPH 581	N/A
PHLS 5996	MPH 586	N/A
PHLS 5997	MPH 590	N/A
PHLS 5998	MPH 596	N/A
PHLS 5999	MPH 599	N/A
PHYS-PHYSICS		
PHYS 1111	PHYS 150	Unique
PHYS 1112	PHYS 210	Unique
PHYS 1115G	PHYS 110G	Common
PHYS 1125G	PHYS 120G	Common

PHYS 1230G	PHYS 211G	Common
PHYS 1230L	PHYS 211GL	Common
PHYS 1240G	PHYS 212G	Common
PHYS 1240L	PHYS 212GL	Common
PHYS 1310G	PHYS 215G	Common
PHYS 1310L	PHYS 215GL	Common
PHYS 1311	PHYS 205	Common
PHYS 1320G	PHYS 216G	Common
PHYS 1320L	PHYS 216GL	Common
PHYS 1321	PHYS 206	Common
PHYS 2110	PHYS 213	Unique
PHYS 2110L	PHYS 213 L	Unique
PHYS 2111	PHYS 203	Unique
PHYS 2120	PHYS 217	Unique
PHYS 2120L	PHYS 217 L	Unique
PHYS 2121	PHYS 218	Unique
PHYS 2140	PHYS 214	Unique
PHYS 2140L	PHYS 214 L	Unique
PHYS 2141	PHYS 204	Unique
PHYS 2230G	PHYS 221G	Unique
PHYS 2230L	PHYS 221GL	Unique
PHYS 2231	PHYS 223	Common
PHYS 2240G	PHYS 222G	Unique
PHYS 2240L	PHYS 222GL	Unique
PHYS 2241	PHYS 224	Common
PHYS 2996	PHYS 290	Unique
PHYS 2997	PHYS 280	Unique
PLEN-PLANT & ENVIRONMENTAL SCIENCES		
PLEN 6110	ENVS 605	N/A
PLEN 6120	AGRO 620	N/A
PLEN 6120	HORT 620	N/A
PLEN 6210	AGRO 625	N/A
PLEN 6210	HORT 625	N/A
PLEN 6210	SOIL 625	N/A
PLEN 6210	EPWS 625	N/A
PLEN 6320	SOIL 652	N/A
PLEN 6410	SOIL 655	N/A
PLEN 6415	AGRO 609	N/A
PLEN 6415	HORT 609	N/A
PLEN 6420	AGRO 610	N/A
PLEN 6420	HORT 610	N/A
PLEN 6425	AGRO 670	N/A
PLEN 6425	HORT 670	N/A
PLEN 6810	AGRO 697	N/A
PLEN 6810	HORT 697	N/A
PLEN 6810	SOIL 697	N/A
PLEN 6910	AGRO 694	N/A
PLEN 6910	SOIL 694	N/A
PLEN 6920	AGRO 696	N/A
PLEN 6920	SOIL 696	N/A
PLEN 6920	ENVS 696	N/A
PLEN 6991	AGRO 600	N/A

PLEN 6991	SOIL 600	N/A
PLEN 6996	AGRO 698	N/A
PLEN 6996	SOIL 698	N/A
PLEN 7000	AGRO 700	N/A
PLEN 7000	SOIL 700	N/A
POLS-POLITICAL SCIENCE		
POLS 1110G	GOVT 110G	Common
POLS 1111	GOVT 101	Unique
POLS 1120G	GOVT 100G	Common
POLS 1130G	GOVT 150G	Common
POLS 2120G	GOVT 160G	Common
POLS 2996	GOVT 201	Unique
POLS 300	GOVT 300	N/A
POLS 308	GOVT 308	N/A
POLS 313	GOVT 313	N/A
POLS 314	GOVT 314	N/A
POLS 315	GOVT 315	N/A
POLS 320	GOVT 320	N/A
POLS 321	GOVT 321	N/A
POLS 324	GOVT 324	N/A
POLS 330	GOVT 330	N/A
POLS 331	GOVT 331	N/A
POLS 335	GOVT 335	N/A
POLS 343	GOVT 343	N/A
POLS 344	GOVT 344	N/A
POLS 345	GOVT 345	N/A
POLS 348	GOVT 348	N/A
POLS 350	GOVT 350	N/A
POLS 353	GOVT 353	N/A
POLS 354	GOVT 354	N/A
POLS 360	GOVT 360	N/A
POLS 361	GOVT 361	N/A
POLS 362	GOVT 362	N/A
POLS 366	GOVT 366	N/A
POLS 367	GOVT 367	N/A
POLS 370	GOVT 370	N/A
POLS 371	GOVT 371	N/A
POLS 372	GOVT 372	N/A
POLS 373	GOVT 373	N/A
POLS 378	GOVT 378	N/A
POLS 379	GOVT 379	N/A
POLS 380V	GOVT 380V	N/A
POLS 382	GOVT 382	N/A
POLS 383	GOVT 383	N/A
POLS 385	GOVT 385	N/A
POLS 386	GOVT 386	N/A
POLS 387	GOVT 387	N/A
POLS 390	GOVT 390	N/A
POLS 391	GOVT 391	N/A
POLS 392	GOVT 392	N/A
POLS 394	GOVT 394	N/A
POLS 395	GOVT 395	N/A

POLS 396	GOVT 396	N/A
POLS 399	GOVT 399	N/A
POLS 405	GOVT 405	N/A
POLS 406	GOVT 406	N/A
POLS 407	GOVT 407	N/A
POLS 410	GOVT 410	N/A
POLS 411	GOVT 411	N/A
POLS 412	GOVT 412	N/A
POLS 415	GOVT 415	N/A
POLS 468	GOVT 468	N/A
POLS 469	GOVT 469	N/A
POLS 493	GOVT 493	N/A
POLS 502	GOVT 502	N/A
POLS 503	GOVT 503	N/A
POLS 505	GOVT 505	N/A
POLS 510	GOVT 510	N/A
POLS 517	GOVT 517	N/A
POLS 519	GOVT 519	N/A
POLS 522	GOVT 522	N/A
POLS 527	GOVT 527	N/A
POLS 530	GOVT 530	N/A
POLS 536	GOVT 536	N/A
POLS 537	GOVT 537	N/A
POLS 540	GOVT 540	N/A
POLS 541	GOVT 541	N/A
POLS 542	GOVT 542	N/A
POLS 543	GOVT 543	N/A
POLS 544	GOVT 544	N/A
POLS 547	GOVT 547	N/A
POLS 548	GOVT 548	N/A
POLS 549	GOVT 549	N/A
POLS 550	GOVT 550	N/A
POLS 560	GOVT 560	N/A
POLS 561	GOVT 561	N/A
POLS 563	GOVT 563	N/A
POLS 564	GOVT 564	N/A
POLS 569	GOVT 569	N/A
POLS 570	GOVT 570	N/A
POLS 574	GOVT 574	N/A
POLS 578	GOVT 578	N/A
POLS 579	GOVT 579	N/A
POLS 580	GOVT 580	N/A
POLS 587	GOVT 587	N/A
POLS 590	GOVT 590	N/A
POLS 591	GOVT 591	N/A
POLS 593	GOVT 593	N/A
POLS 596	GOVT 596	N/A
POLS 598	GOVT 598	N/A
POLS 599	GOVT 599	N/A
PORT-PORTUGUESE		
PORT 1110	PORT 213	Common
PORT 1120	PORT 214	Common

PSYC-PSYCHOLOGY

PSYC 1110G	PSY 201G	Common
PSYC 2221	PSY 266	Unique
PSYC 2230	PSY 290	Common
PSYC 2311	PSY 274	Unique
PSYC 301	PSY 301	N/A
PSYC 302	PSY 302	N/A
PSYC 310	PSY 310	N/A
PSYC 311	PSY 311	N/A
PSYC 315	PSY 315	N/A
PSYC 317	PSY 317	N/A
PSYC 320	PSY 320	N/A
PSYC 321	PSY 321	N/A
PSYC 324	PSY 324	N/A
PSYC 325	PSY 325	N/A
PSYC 330	PSY 330	N/A
PSYC 340	PSY 340	N/A
PSYC 350	PSY 350	N/A
PSYC 351	PSY 351	N/A
PSYC 359	PSY 359	N/A
PSYC 370	PSY 370	N/A
PSYC 375	PSY 375	N/A
PSYC 376	PSY 376	N/A
PSYC 380	PSY 380	N/A
PSYC 383	PSY 383	N/A
PSYC 400	PSY 400	N/A
PSYC 401	PSY 401	N/A
PSYC 402	PSY 402	N/A
PSYC 430	PSY 430	N/A
PSYC 442	PSY 442	N/A
PSYC 450	PSY 450	N/A
PSYC 470	PSY 470	N/A
PSYC 507	PSY 507	N/A
PSYC 508	PSY 508	N/A
PSYC 509	PSY 509	N/A
PSYC 510	PSY 510	N/A
PSYC 520	PSY 520	N/A
PSYC 522	PSY 522	N/A
PSYC 523	PSY 523	N/A
PSYC 524	PSY 524	N/A
PSYC 527	PSY 527	N/A
PSYC 529	PSY 529	N/A
PSYC 540	PSY 540	N/A
PSYC 547	PSY 547	N/A
PSYC 550	PSY 550	N/A
PSYC 570	PSY 570	N/A
PSYC 590	PSY 590	N/A
PSYC 598	PSY 598	N/A
PSYC 599	PSY 599	N/A
PSYC 600	PSY 600	N/A
PSYC 698	PSY 698	N/A
PSYC 700	PSY 700	N/A

READ-READING

READ 3110	RDG 371	N/A
READ 3996	RDG 395	N/A
READ 4310	RDG 360	N/A
READ 4320	RDG 361	N/A
READ 4330	RDG 414	N/A
READ 5210	RDG 522	N/A
READ 5220	RDG 530	N/A
READ 5310	RDG 560	N/A
READ 5320	RDG 561	N/A
READ 5330	RDG 514	N/A
READ 5340	RDG 511	N/A
READ 5350	RDG 510	N/A
READ 5360	RDG 518	N/A
READ 5410	RDG 525	N/A
READ 5420	RDG 590	N/A
READ 5990	RDG 585	N/A
READ 5992	RDG 536	N/A
READ 5996	RDG 598	N/A
READ 6110	RDG 608	N/A
READ 6120	RDG 617	N/A
READ 6130	RDG 639	N/A
READ 6210	RDG 630	N/A
READ 6320	RDG 633	N/A
READ 6991	RDG 600	N/A
READ 6992	RDG 636	N/A
READ 6996	RDG 698	N/A
READ 6997	RDG 605	N/A
READ 6999	RDG 699	N/A

RGSC-RANGE SCIENCE

RGSC 1110	RGSC 150	Unique
RGSC 2110	RGSC 294	Common
RGSC 2996	RGSC 250	Unique

RXPP-PRESCRIPTION PRIVATE PRACTICE PSYCHOLOGY

RXPP 6110	RXPP 601	N/A
RXPP 6120	RXPP 602	N/A
RXPP 6210	RXPP 603	N/A
RXPP 6220	RXPP 604	N/A
RXPP 6230	RXPP 605	N/A
RXPP 6310	RXPP 606	N/A
RXPP 6320	RXPP 607	N/A
RXPP 6330	RXPP 608	N/A
RXPP 6410	RXPP 609	N/A
RXPP 6420	RXPP 610	N/A
RXPP 6510	RXPP 611	N/A
RXPP 6520	RXPP 612	N/A
RXPP 6996	RXPP 698	N/A

SIGN-SIGN LANGUAGE

SIGN 1110	C D 374	Common
SIGN 1120	C D 375	Common
SIGN 2110	C D 476	Common
SIGN 574	C D 574	N/A

SOCI-SOCIOLOGY

SOCI 1110G	SOC 101G	Common
SOCI 2230	SOC 263	Common
SOCI 2230	SOC 269	Common
SOCI 2240	SOC 258	Common
SOCI 2261	SOC 262	Unique
SOCI 2310G	SOC 201G	Common
SOCI 3110V	SOCI 330V	N/A
SOCI 3120V	SOCI 360V	N/A
SOCI 3150	SOCI 352	N/A
SOCI 3160	SOCI 353	N/A
SOCI 3165	SOCI 351	N/A
SOCI 3240	SOCI 359	N/A
SOCI 3245V	SOCI 374V	N/A
SOCI 3250	SOCI 390	N/A
SOCI 3255	SOCI 393	N/A
SOCI 3270	SOCI 357	N/A
SOCI 3310V	SOCI 361V	N/A
SOCI 3315	SOCI 362	N/A
SOCI 3330	SOCI 365	N/A
SOCI 3340V	SOCI 376V	N/A
SOCI 3410	SOCI 371	N/A
SOCI 3415	SOCI 375	N/A
SOCI 3510	SOCI 391	N/A
SOCI 3520	SOCI 392	N/A
SOCI 3610V	SOCI 336V	N/A
SOCI 3620V	SOCI 394V	N/A
SOCI 4150	SOCI 444	N/A
SOCI 4155	SOCI 445	N/A
SOCI 4160	SOCI 446	N/A
SOCI 4240V	SOCI 458V	N/A
SOCI 4310	SOCI 409	N/A
SOCI 4320	SOCI 430	N/A
SOCI 4335V	SOCI 465V	N/A
SOCI 4337	SOCI 464	N/A
SOCI 4410	SOCI 480	N/A
SOCI 4420	SOCI 470	N/A
SOCI 4430	SOCI 473	N/A
SOCI 4450	SOCI 486	N/A
SOCI 4460	SOCI 489	N/A
SOCI 4510	SOCI 481	N/A
SOCI 4555	SOCI 477	N/A
SOCI 4992	SOCI 449	N/A
SOCI 4996	SOCI 448	N/A
SOCI 4998	SOCI 496	N/A
SOCI 4999	SOCI 401	N/A
SOCI 5110	SOCI 501	N/A
SOCI 5150	SOCI 544	N/A
SOCI 5153	SOCI 553	N/A
SOCI 5155	SOCI 545	N/A
SOCI 5157	SOCI 561	N/A
SOCI 5160	SOCI 546	N/A

SOCI 5163	SOCI 551	N/A
SOCI 5165	SOCI 552	N/A
SOCI 5170	SOCI 582	N/A
SOCI 5175	SOCI 583	N/A
SOCI 5270	SOCI 559	N/A
SOCI 5310	SOCI 509	N/A
SOCI 5320	SOCI 530	N/A
SOCI 5335	SOCI 565	N/A
SOCI 5337	SOCI 564	N/A
SOCI 5410	SOCI 571	N/A
SOCI 5415	SOCI 575	N/A
SOCI 5420	SOCI 570	N/A
SOCI 5430	SOCI 587	N/A
SOCI 5440	SOCI 579	N/A
SOCI 5450	SOCI 586	N/A
SOCI 5460	SOCI 589	N/A
SOCI 5510	SOCI 581	N/A
SOCI 5515	SOCI 574	N/A
SOCI 5555	SOCI 577	N/A
SOCI 5991	SOCI 549	N/A
SOCI 5996	SOCI 548	N/A
SOCI 5998	SOCI 596	N/A
SOCI 5999	SOCI 599	N/A
SOIL-SOIL		
SOIL 2110	SOIL 252	Common
SOIL 2110L	SOIL 252 L	Common
SOIL 2996	SOIL 200	Unique
SOWK-SOCIAL WORK		
SOWK 2110G	S WK 221G	Common
SOWK 2111	S WK 251	Unique
SOWK 3110	SOWK 309	N/A
SOWK 3120	SOWK 311	N/A
SOWK 3130	SOWK 312	N/A
SOWK 3140V	SOWK 331V	N/A
SOWK 3150	SOWK 316	N/A
SOWK 3210	SOWK 300	N/A
SOWK 3220	SOWK 313	N/A
SOWK 3230	SOWK 315	N/A
SOWK 4110	SOWK 417	N/A
SOWK 4210	SOWK 415	N/A
SOWK 4220	SOWK 416	N/A
SOWK 4230	SOWK 443	N/A
SOWK 4240	SOWK 418	N/A
SOWK 4310	SOWK 401	N/A
SOWK 4311	SOWK 412	N/A
SOWK 4320	SOWK 403	N/A
SOWK 4321	SOWK 419	N/A
SOWK 4510	SOWK 490	N/A
SOWK 4996	SOWK 497	N/A
SOWK 4997	SOWK 449	N/A
SOWK 5110	MSW 509	N/A
SOWK 5120	MSW 560	N/A

SOWK 5130	MSW 510	N/A
SOWK 5140	MSW 514	N/A
SOWK 5150	MSW 500	N/A
SOWK 5160	MSW 520	N/A
SOWK 5170	MSW 521	N/A
SOWK 5180	MSW 551	N/A
SOWK 5190	MSW 552	N/A
SOWK 5220	MSW 562	N/A
SOWK 5250	MSW 503	N/A
SOWK 5280	MSW 554	N/A
SOWK 5290	MSW 555	N/A
SOWK 5310	MSW 547	N/A
SOWK 5320	MSW 524	N/A
SOWK 5330	MSW 525	N/A
SOWK 5340	MSW 526	N/A
SOWK 5350	MSW 527	N/A
SOWK 5510	MSW 590	N/A
SOWK 5996	MSW 597	N/A
SOWK 5997	MSW 595	N/A
SOWK 5999	MSW 599	N/A
SPAN-SPANISH		
SPAN 1110	SPAN 111	Common
SPAN 1120	SPAN 112	Common
SPAN 1210	SPAN 113	Common
SPAN 1220	SPAN 213	Common
SPAN 2110	SPAN 211	Common
SPAN 2120	SPAN 212	Common
SPAN 2210	SPAN 214	Common
SPED-SPECIAL EDUCATION		
SPED 2996	SPED 201	Unique
SPED 3105	SPED 350	N/A
SPED 3110	SPED 355	N/A
SPED 3120	SPED 360	N/A
SPED 4110	SPED 407	N/A
SPED 4120	SPED 406	N/A
SPED 4130	SPED 409	N/A
SPED 4140	SPED 411	N/A
SPED 4150	SPED 480	N/A
SPED 4210	SPED 463	N/A
SPED 4220	SPED 459	N/A
SPED 4310	SPED 485	N/A
SPED 4320	SPED 486	N/A
SPED 4330	SPED 487	N/A
SPED 4340	SPED 488	N/A
SPED 4810	SPED 483	N/A
SPED 4811	SPED 481	N/A
SPED 4820	SPED 482	N/A
SPED 4840	SPED 492	N/A
SPED 4992	SPED 495	N/A
SPED 4996	SPED 489	N/A
SPED 5105	SPED 500	N/A
SPED 5110	SPED 507	N/A

SPED 5120	SPED 506	N/A
SPED 5130	SPED 509	N/A
SPED 5140	SPED 511	N/A
SPED 5150	SPED 580	N/A
SPED 5160	SPED 545	N/A
SPED 5210	SPED 504	N/A
SPED 5220	SPED 559	N/A
SPED 5230	SPED 523	N/A
SPED 5310	SPED 585	N/A
SPED 5320	SPED 586	N/A
SPED 5330	SPED 587	N/A
SPED 5340	SPED 588	N/A
SPED 5405	SPED 532	N/A
SPED 5410	SPED 533	N/A
SPED 5420	SPED 534	N/A
SPED 5430	SPED 536	N/A
SPED 5440	SPED 538	N/A
SPED 5450	SPED 539	N/A
SPED 5460	SPED 552	N/A
SPED 5470	SPED 553	N/A
SPED 5480	SPED 554	N/A
SPED 5490	SPED 555	N/A
SPED 5810	SPED 582	N/A
SPED 5811	SPED 548	N/A
SPED 5820	SPED 590	N/A
SPED 5850	SPED 513	N/A
SPED 5860	SPED 510	N/A
SPED 5870	SPED 583	N/A
SPED 5990	SPED 522	N/A
SPED 5991	SPED 598	N/A
SPED 5996	SPED 501	N/A
SPED 5999	SPED 599	N/A
SPED 6110	SPED 607	N/A
SPED 6120	SPED 606	N/A
SPED 6160	SPED 645	N/A
SPED 6170	SPED 619	N/A
SPED 6310	SPED 685	N/A
SPED 6330	SPED 687	N/A
SPED 6340	SPED 688	N/A
SPED 6810	SPED 690	N/A
SPED 6830	SPED 613	N/A
SPED 6840	SPED 610	N/A
SPED 6991	SPED 600	N/A
SPED 6996	SPED 698	N/A
SPED 6997	SPED 605	N/A
SPED 6998	SPED 640	N/A
SPED 7000	SPED 700	N/A
SPHS-SPEECH & HEARING SCIENCE		
SPHS 2110	C D 221	Common
SPHS 4510	SPHS 323	N/A
SPHS 4520	SPHS 422	N/A
SPHS 4610	SPHS 301	N/A

SPHS 4620	SPHS 324	N/A
SPHS 4710	SPHS 421	N/A
SPHS 4720	SPHS 322	N/A
SPHS 4810	SPHS 326	N/A
SPHS 4820	SPHS 423	N/A
SPHS 4830	SPHS 424	N/A
SPHS 5110	SPHS 505	N/A
SPHS 5120	SPHS 523	N/A
SPHS 5130	SPHS 525	N/A
SPHS 5140	SPHS 542	N/A
SPHS 5210	SPHS 530	N/A
SPHS 5220	SPHS 535	N/A
SPHS 5230	SPHS 584	N/A
SPHS 5310	SPHS 545	N/A
SPHS 5320	SPHS 547	N/A
SPHS 5330	SPHS 583	N/A
SPHS 5340	SPHS 585	N/A
SPHS 5350	SPHS 586	N/A
SPHS 5410	SPHS 521	N/A
SPHS 5510	SPHS 541	N/A
SPHS 5520	SPHS 548	N/A
SPHS 5988	SPHS 590	N/A
SPHS 5989	SPHS 640	N/A
SPHS 5990	SPHS 589	N/A
SPHS 5996	SPHS 591	N/A
SPHS 5999	SPHS 599	N/A
SPMD-SPORTS MEDICINE		
SPMD 1110	SP M 190	Unique
SPMD 1120	SP M 191	Unique
SPMD 1190	SP M 272	Unique
SPMD 1195	SP M 273	Unique
SPMD 1310	SP M 175	Unique
SPMD 1350	PE P 185	Unique
SPMD 2130	SP M 250	Unique
SPMD 2210	SP M 271	Unique
SPMD 2210L	SP M 271 L	Unique
SPMD 2250	PE P 208	Unique
SPMD 2310	SP M 200	Unique
SPMD 3010	SP M 310	N/A
SPMD 3050	SP M 375	N/A
SPMD 3090	SP M 372	N/A
SPMD 3093	SP M 373	N/A
SPMD 3110	PE P 323	N/A
SPMD 3120	PE P 363	N/A
SPMD 3130	PE P 392	N/A
SPMD 3140	PE P 394	N/A
SPMD 3150	PE P 393	N/A
SPMD 3160	PE P 315	N/A
SPMD 3210	SP M 371	N/A
SPMD 3210L	SP M 371 L	N/A
SPMD 3250	SP M 324	N/A
SPMD 3310	PE P 319	N/A

SPMD 3350	SP M 412	N/A
SPMD 3410	SP M 308	N/A
SPMD 3450	SP M 305	N/A
SPMD 3450L	SP M 305 L	N/A
SPMD 3550	SP M 304	N/A
SPMD 3610	SP M 303	N/A
SPMD 3650	SP M 341	N/A
SPMD 3710	SP M 342	N/A
SPMD 4010	SP M 410	N/A
SPMD 4015	SP M 415	N/A
SPMD 4020	SP M 420	N/A
SPMD 4025	SP M 411	N/A
SPMD 4030	SP M 425	N/A
SPMD 4090	SP M 422	N/A
SPMD 4093	SP M 423	N/A
SPMD 4095	SP M 424	N/A
SPMD 4098	SP M 498	N/A
SPMD 4110	PE P 455	N/A
SPMD 4130	PE P 466	N/A
SPMD 4210	SP M 451	N/A
SPMD 4250	SP M 460	N/A
SPMD 4250L	SP M 460 L	N/A
SPMD 4350	SP M 330	N/A
SPMD 4410	SP M 456	N/A
SPMD 4450	SP M 307	N/A
SPMD 4510	SP M 309	N/A
SPMD 4550	SP M 223	N/A
SPMD 4610	PE P 465	N/A
SPMD 4997	SP M 499	N/A
SPMD 4998	SP M 445	N/A
SPMD 5010	SP M 510	N/A
SPMD 5015	SP M 513	N/A
SPMD 5020	SP M 514	N/A
SPMD 5025	SP M 511	N/A
SPMD 5030	SP M 515	N/A
SPMD 5310	SP M 512	N/A
SPMD 5350	SP M 560	N/A
SPMD 5410	SP M 509	N/A
SPMD 5450	SP M 556	N/A
SPMD 5510	SP M 504	N/A
SPMD 5550	SP M 545	N/A
SPMD 6310	PE P 624	N/A
SPMD 6350	SP M 551	N/A
SPMD 6410	SP M 608	N/A
SPMD 6450	SP M 665	N/A
SPMD 6510	SP M 660	N/A
SPMD 6710	SP M 597	N/A
SPMD 6750	SP M 600	N/A
SPMD 6996	PE P 501	N/A
SPMD 7000	SP M 700	N/A
THEA-THEATRE		
THEA 1110G	THTR 101G	Common

THEA 1210G	THTR 105	Common
THEA 1221	THTR 110	Unique
THEA 1222	THTR 120	Unique
THEA 1223	THTR 130	Unique
THEA 1310	THTR 142	Common
THEA 1310L	THTR 142 L	Unique
THEA 1415	THTR 149	Unique
THEA 2221	THTR 210	Unique
THEA 2222	THTR 206	Unique
THEA 2310	THTR 141	Common
THEA 2310L	THTR 141 L	Unique
THEA 2340	THTR 250	Unique
THEA 2415	THTR 249	Unique
THEA 2421	THTR 220	Unique
THEA 2993	THTR 200	Unique
THEA 2996	THTR 222	Unique
THEA 300	THTR 300	N/A
THEA 303	THTR 303	N/A
THEA 304	THTR 304	N/A
THEA 305	THTR 305	N/A
THEA 307V	THTR 307V	N/A
THEA 308	THTR 308	N/A
THEA 310	THTR 310	N/A
THEA 311	THTR 311	N/A
THEA 312	THTR 312	N/A
THEA 313	THTR 313	N/A
THEA 317	THTR 317	N/A
THEA 321V	THTR 321V	N/A
THEA 322	THTR 322	N/A
THEA 323	THTR 323	N/A
THEA 329	THTR 329	N/A
THEA 330	THTR 330	N/A
THEA 334	THTR 334	N/A
THEA 337	THTR 337	N/A
THEA 341	THTR 341	N/A
THEA 343	THTR 343	N/A
THEA 345	THTR 345	N/A
THEA 346	THTR 346	N/A
THEA 347	THTR 347	N/A
THEA 348	THTR 348	N/A
THEA 349	THTR 349	N/A
THEA 352	THTR 352	N/A
THEA 353	THTR 353	N/A
THEA 354	THTR 354	N/A
THEA 355	THTR 355	N/A
THEA 356	THTR 356	N/A
THEA 357	THTR 357	N/A
THEA 360	THTR 360	N/A
THEA 366	THTR 366	N/A
THEA 384	THTR 384	N/A
THEA 395	THTR 395	N/A
THEA 396	THTR 396	N/A

THEA 408	THTR 408	N/A
THEA 409	THTR 409	N/A
THEA 410	THTR 410	N/A
THEA 414	THTR 414	N/A
THEA 417	THTR 417	N/A
THEA 430	THTR 430	N/A
THEA 435	THTR 435	N/A
THEA 439	THTR 439	N/A
THEA 440	THTR 440	N/A
THEA 450	THTR 450	N/A
THEA 535	THTR 535	N/A

College of Agricultural, Consumer, and Environmental Sciences

Dean and Chief Administrative Officer- *Rolando A. Flores*

Associate Dean and Director of Academic Programs - *Donald Conner*

Associate Dean and Director of the Cooperative Extension Service - *Jon C. Boren*

Associate Dean and Director of the Agricultural Experiment Station - *Leslie D. Edgar*

Scholarship Coordinator - *Ashley Lama-Mendoza*

The College of Agricultural, Consumer and Environmental Sciences is comprised of eight departments:

- Agricultural and Extension Education (p. 276)
- Agricultural Economics and Agricultural Business (p. 289)
- Animal and Range Sciences (p. 302)
- Entomology, Plant Pathology and Weed Science (p. 320)
- Family and Consumer Sciences (p. 333)
- Fish, Wildlife and Conservation Ecology (p. 370)
- Plant and Environmental Sciences (p. 382)
- School of Hotel, Restaurant and Tourism Management (p. 411)

College Undergraduate Degree Requirements

1. Complete general education common core requirements.
2. Complete course requirements for the major.
3. Earn a minimum of 120 semester credits. Of this total at least 48 semester credits must be in upper-division courses (numbered 300 or above).
4. Earn a cumulative grade-point average of no less than 2.0.

Preprofessional Programs

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. The program that is administered by the College of Agricultural, Consumer and Environmental Sciences is Pre veterinary Medicine. Several majors are aligned for students to apply for the New Mexico State University Osteopathic Medicine Pathway Program to Burrell College of Osteopathic Medicine.

Veterinary Medicine (Preprofessional Training Only, Non-Degree)

The Doctor of Veterinary Medicine (D.V.M.) degree is a professional degree that is not offered by any college or university in New Mexico; however, you may complete the preparatory program required for admittance to the professional colleges of veterinary medicine at New Mexico State University.

The D.V.M. degree normally requires four years of training in a professional college subsequent to completion of a preveterinary program that requires at least three years of college-level instruction. In most instances a baccalaureate degree is a distinct advantage to the applicant.

Curriculum requirements are determined by the particular school or college of veterinary medicine. The Department of Animal and Range Sciences maintains current requirements for Colorado State University, Washington State, Oregon State and Texas A&M. You should check with an advisor for specific course requirements. As a student from New Mexico, you may be eligible for financial assistance under the program of the Western Interstate Commission for Higher Education (WICHE). See the section on WICHE in the General Information chapter under Resources for Students for more information.

Bachelor Degrees

A

- Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture (p. 285)
- Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture (p. 286)
- Agricultural and Extension Education (Agricultural Extension/Community Development) - Bachelor of Science in Agriculture (p. 287)
- Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture (p. 323)
- Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 325)
- Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 326)
- Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 327)
- Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture (p. 329)

- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 297)
- Agronomy - Bachelor of Science in Agriculture (p. 393)
- Animal Science (Animal Industry) - Bachelor of Science in Agriculture (p. 312)
- Animal Science (Science) - Bachelor of Science in Agriculture (p. 314)

C

- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 374)

E

- Environmental Science - Bachelor of Science in Environmental Science (p. 395)

F

- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 353)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 355)
- Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 376)
- Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 379)
- Food Science and Technology (Culinary Science) - Bachelor of Science in Food Science and Technology (p. 357)
- Food Science and Technology (Meat Science) - Bachelor of Science in Food Science and Technology (p. 358)
- Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology (p. 360)

G

- General Agriculture - Bachelor of Science in Agriculture (p. 331)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 397)

H

- Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture (p. 401)
- Horticulture - Bachelor of Science in Agriculture (p. 399)
- Hotel, Restaurant and Tourism Management - Bachelor of Science (p. 419)
- Hotel, Restaurant and Tourism Management - Bachelor of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/hotel-restaurant-tourism-mgt-bs-online/>)
- Human Development & Family Science - Bachelor of Science (p. 362)
- Human Development and Family Science - Bachelor of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/human-development-family-science-bs-online/>)
- Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences (p. 364)

- Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences (p. 366)

N

- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 300)

R

- Range Science - Bachelor of Science in Agriculture (p. 316)

S

- Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture (p. 404)
- Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture (p. 406)
- Soil Science (Soils) - Bachelor of Science in Agriculture (p. 408)

Masters Degrees

A

- Agricultural and Extension Education (Agricultural Strategic Communications) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agricultural-extension-education-agricultural-strategic-comm-ma-online/>)
- Agricultural and Extension Education - Master of Arts (p. 93)
- Agricultural and Extension Education - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agricultural-extension-education-ma-online/>)
- Agricultural Biology - Master of Science (p. 93)
- Agricultural Economics - Master of Science (p. 94)
- Agriculture (Agribusiness) - Master of Agriculture (p. 91)
- Agriculture (Agribusiness) - Master of Agriculture (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agriculture-agribusiness-mag-online/>)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 92)
- Animal Science - Master of Science (p. 96)

F

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)
- Fish, Wildlife and Conservation Ecology - Master of Science (p. 148)

H

- Horticulture - Master of Science (p. 151)

M

- Molecular Biology - Master of Science (p. 156)

P

- Plant and Environmental Science - Master of Science (p. 158)

R

- Range Science - Master of Science (p. 163)

W

- Water Science and Management (Agricultural Water Resources) - Master of Science (p. 169)
- Water Science and Management (International Water Resilience) - Master of Science (p. 170)
- Water Science and Management (Water Economics and Policy) - Master of Science (p. 170)
- Water Science and Management (Water Informatics) - Master of Science (p. 171)
- Water Science and Management (Water Quality and Treatment) - Master of Science (p. 172)
- Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science (p. 172)
- Water Science and Management - Master of Science (p. 168)

Doctoral Degrees**A**

- Animal Science - Doctor of Philosophy (p. 174)

M

- Molecular Biology - Doctor of Philosophy (p. 196)

P

- Plant and Environmental Science - Doctor of Philosophy (p. 198)

R

- Range Science - Doctor of Philosophy (p. 198)

W

- Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy (p. 201)
- Water Science and Management (International Water Resilience) - Doctor of Philosophy (p. 201)
- Water Science and Management (Water Economics and Policy) - Doctor of Philosophy (p. 202)
- Water Science and Management (Water Informatics) - Doctor of Philosophy (p. 202)
- Water Science and Management (Water Quality Treatments) - Doctor of Philosophy (p. 203)
- Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy (p. 203)
- Water Science and Management - Doctor of Philosophy (p. 200)

Undergraduate Minors**A**

- Agricultural and Extension Education - Undergraduate Minor (p. 289)

- Agricultural and Natural Resource Leadership - Undergraduate Minor (p. 289)
- Agricultural Business Management- Undergraduate Minor (p. 301)
- Agronomy - Undergraduate Minor (p. 410)

C

- Child Advocacy Studies (CAST) - Undergraduate Minor (p. 369)
- Conservation Ecology - Undergraduate Minor (p. 381)
- Culinary Science - Undergraduate Minor (p. 369)

D

- Dairy Science - Undergraduate Minor (p. 318)

E

- Entomology - Undergraduate Minor (p. 333)
- Environmental Science - Undergraduate Minor (p. 410)

F

- Fashion Merchandising & Design - Undergraduate Minor (p. 370)
- Food Science - Undergraduate Minor (p. 370)

G

- General Agriculture - Bachelor of Science in Agriculture (p. 331)
- Genetics and Biotechnology - Undergraduate Minor (p. 410)

H

- Horse Management - Undergraduate Minor (p. 319)
- Horticulture - Undergraduate Minor (p. 411)
- Hotel, Restaurant and Tourism Management - Undergraduate Minor (p. 421)
- Human Animal Interaction - Undergraduate Minor (p. 319)
- Human Development and Family Science - Undergraduate Minor (p. 370)

L

- Livestock Production - Undergraduate Minor (p. 319)

N

- Natural Resource Economics - Undergraduate Minor (p. 302)
- Nutrition - Undergraduate Minor (p. 370)

P

- Pest Management - Undergraduate Minor (p. 333)
- Plant Pathology - Undergraduate Minor (p. 333)

R

- Ranch Management - Undergraduate Minor (p. 319)
- Range Science - Undergraduate Minor (p. 319)

S

- Soil Science - Undergraduate Minor (p. 411)

W

- Weed Science - Undergraduate Minor (p. 333)
- Wildlife Science - Undergraduate Minor (p. 382)

Graduate Minors

A

- Agricultural and Extension Education - Graduate Minor (p. 212)
- Animal Science - Graduate Minor (p. 212)

F

- Fish, Wildlife and Conservation Ecology - Graduate Minor (p. 214)
- Food Studies - Graduate Minor (p. 214)

M

- Molecular Biology - Graduate Minor (p. 217)

R

- Range Science - Graduate Minor (p. 218)

Accreditation

The Agricultural Education Teaching program in the Department of Agricultural and Extension Education is accredited by the Council for the Accreditation of Educator Preparation (formerly NCATE) and the State Public Education Department of New Mexico. It is critical that students consult their academic advisor prior to selection of courses for the agriculture, secondary science and teaching endorsements.

The Family and Consumer Sciences Education major in the Department of Family and Consumer Sciences is accredited by the Council for the Accreditation of Educator Preparation (formerly NCATE) and the State Public Education Department of New Mexico, and meets the teacher licensure requirements for the State of New Mexico. Course selection is restricted to meet accreditation requirements, so students should consult their academic advisor prior to selection of courses for the Family and Consumer Sciences Education program.

The Human Nutrition & Dietetic Science (HNDS) major, Dietetics option, is a Didactic Program in Dietetics (DPD) accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). The program meets national requirements to prepare students for a Dietetic Internship. Course selection is restricted to meet accreditation requirements. Students should consult their academic advisor prior to selection of courses for the HNDS Dietetics program.

Agricultural and Extension Education Undergraduate Program Information

The department offers a broad-based curriculum with majors, options and minors that prepare students for many careers as professional educators, communicators and leaders in agricultural, natural resource, technology and related disciplines. Some example occupations that the department prepares its students to enter are agriculture teacher, media specialist, technology teacher, Extension agent, NMDA or USDA professional, industry educational specialist, and development specialist. Graduates work in domestic and/or international settings.

General Undergraduate Degree Requirements

You must meet the general education and departmental requirements for the degree and the major, option or minor chosen. You must establish a cumulative grade-point average of not less than 2.5 before you are admitted into the student teaching or other internship program. You need a minimum of 48 hours in technical agriculture for the secondary teaching certificate program in agriculture.

You may select technical courses required for completion of the majors and options from the following areas:

- agricultural economics (p. 289);
- agricultural mechanics;
- animal and range sciences (p. 302);
- entomology, plant pathology and weed science (p. 320);
- fish, wildlife and conservation ecology (p. 370);
- plant and environmental sciences (p. 382).

Graduate Program Information

The Department of Agricultural and Extension Education requires the following items be sent directly to the department for admission:

- **Three letters of recommendation** - Applicants should request letters of recommendation from individuals who know them well enough to comment on their professional skills and abilities, and on their ability to complete graduate-level work.
- **Career statement** - The two-page letter of application should clearly identify applicant's professional and career goals as well as reasons for pursuing the degree.
- **Personal Interview** - Upon receipt of all application materials, a personal interview may be required at the discretion of the Departmental Graduate Committee.

****Do not send the above items to the Graduate School as this will cause a delay on your admission status.***

General Graduate Degree Requirements

The major requires courses in research methods, teaching methods and data collection and analysis; a graduate seminar; and a thesis or creative component. The department also have two 9 credit minors which are available to students completing major work in other departments.

Thesis plan: Requires a minimum of 30 semester credits which includes 4-6 credits of thesis. *(Both plans require a final oral examination).*

Non-Thesis plan: Requires 32 semester credits of course work which includes a focused creative component. *(Both plans require a final oral examination).*

Flexibility in each program allows students to pursue professional interests and to develop specialized competencies in agricultural and extension education, technology education, and in technical and scientific areas. The department delivers courses in evening, weekend and distance formats (go to <https://global.nmsu.edu/> and click on degree programs, and then Agricultural and Extension Education) to accommodate student needs. Previous experience in teaching, extension and/or other professional education positions is highly recommended to be considered for a graduate teaching assistantship.

The department offers major work for a Master of Arts in Agricultural and Extension Education. The degree can be obtained with emphasis in

- Agricultural Teacher Education,
- Extension Education,
- Strategic Communications

Degrees for the Department

Bachelor's Degree(s)

- Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture (p. 285)
- Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture (p. 286)
- Agricultural and Extension Education (Agricultural Extension/Community Development) - Bachelor of Science in Agriculture (p. 287)

Master's Degrees

- Agricultural and Extension (Agricultural Strategic Communications) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agricultural-extension-education-agricultural-strategic-comm-a-online/>)
- Agricultural and Extension Education - Master of Arts (p. 93)
- Agricultural and Extension Education - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agricultural-extension-education-ma-online/>)

Minors for the Department

- Agricultural and Extension Education - Graduate Minor (p. 212)
- Agricultural and Extension Education - Undergraduate Minor (p. 289)
- Agricultural and Natural Resource Leadership - Undergraduate Minor (p. 289)

Professor Steve Frazee, Department Head

Professors Edgar, Frazee, VanLeeuwen; **Assistant Professors** Roberts-Hill, Norris-Parrish, Spears, Norris

D. Edgar, Ph.D. (Texas A&M)– agricultural education, agricultural mechanization, methods of instruction, curriculum design and evaluation; S. Frazee, Ph.D. (Texas A&M)–agricultural communications, agricultural education, agricultural extension; W. Norris, Ph.D. (Mississippi State)– youth development, youth leadership, youth program development; L. Roberts-Hill, Ph.D. (Texas Tech) - visual and science communication, community networks, public opinion, and the scholarship of teaching and learning; S. Norris, Ph.D. (Texas A&M) - agricultural communications, agricultural literacy, science communication, national security, education, youth development; L. Spears, Ph.D. (Iowa State University) - agricultural education and studies, curriculum and instructional technology; D. VanLeeuwen, Ph.D. (Oregon State)– statistics and research design

Agricultural Extension Education Courses

AXED 1110. Introduction to Agricultural, Extension, and Technology Education

3 Credits (3)

Orientation to programs, philosophies, competencies and leadership skills needed by professionals in agricultural and technology education, extension education, agricultural communications, and related career opportunities in industry, governmental agencies, and international organizations.

Learning Outcomes

1. Orient student to the AXED Department and their role as students.
2. Explore career opportunities (and the related skill sets needed for success) in public schools, career and technical institutions, the cooperative extension service, community, and international development, agricultural communications, agricultural industry associations and public service (e.g., NMDA and USDA).
3. Develop an understanding of the self-leadership skills needed to be effective in a variety of professional and personal environments.
4. Familiarize students with the aspects included within a total program in agricultural or technology education.
5. Strengthen skills in oral and written communications.

AXED 1130. Techniques in Agricultural Mechanization

3 Credits (2+2P)

Development of competencies in agricultural mechanics including safety, tool identification, operation and maintenance of hand and power tools, cold metal, drafting, and plumbing procedures. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

Learning Outcomes

1. To understand basic drafting language used in orthographic and isometric drawings.
2. To develop an understanding of the proper use and safety of basic hand and power tools.
3. To develop skills needed to operate basic hand and power tools correctly.
4. To develop an understanding of surveying methods and building layout for construction.
5. To develop an adequate level of competence in workshop techniques.
6. To prepare students to properly teach and demonstrate these techniques to others who may use them as a means of earning a living.

AXED 2110. Metal Fabrication**3 Credits (2+4P)**

Instruction and skill development in process and procedures of metal fusion, including gas and electric welding techniques, safety, and oxy-acetylene cutting and welding. Designed to improve mechanical skills needed in agriculturally related occupations in education and industry.

Learning Outcomes

1. To develop students understanding and appreciation for metal fabrication, design and teaching.
2. To develop in the student an adequate level of competence in shop work techniques, so that the student may be able to properly teach and demonstrate multiple metal fabrication techniques to others who may use them as a mean of earning a living.
3. To develop the student's fundamental techniques in shielded metal arc welding, oxy-acetylene welding and cutting operations, metal inert gas welding (MIG), and gas tungsten-arc welding as needed in repair and construction of agricultural equipment.
4. Student will understand appropriate shop management techniques and have an appreciation for mechanized agriculture.
5. To assist the student in developing an understanding and comprehension of the fundamental principles that apply to the area of basic shop work included in this course; such as proper selection of electrodes, oxy-acetylene filler rods, welding processes best suited for given welding conditions, the proper tool for the job, etc.
6. To develop in the student comprehension of safety practices that apply to the areas of basic shop work, tools, and equipment required in the course.

AXED 2130. Early Field-Based Experience**2 Credits (2)**

First Hand view of the roles of professional educators through field experiences with Cooperative Extension or other government agencies. Includes 4 weeks of classroom instruction and 30 hours of observation in a work setting. Consent of Instructor required. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify successful characteristics, tips and strategies that an agricultural education professional may use as part of their program.
2. Identify key components of an agricultural education program
3. Actively observe a local agricultural education program.
4. Identify ways that your agency program networks and interacts with clientele and community

AXED 2996. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Student can only take up to 6 credits per semester, and will not be able to have more than 12 credits count towards their degree. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

AXED 3115. Small Engine Technology**3 Credits (2+2P)**

Development of competencies in small gasoline engines; theory, operation, design, maintenance and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3120. Agricultural Structures**3 Credits (2+3P)**

Selection and use of agricultural building materials. Design, construction, and maintenance of agricultural structures. Development of competencies in carpentry, concrete, electricity, masonry, and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3130. Advanced Technology in the Agricultural Mechanization**3 Credits (2+3P)**

Students will construct a project in the area of agricultural mechanization under the direction of instructor. Project must be completed within a semester and of sufficient complexity for 3 credits.

Prerequisite: AXED 1130 and AXED 2110 or consent of instructor.

AXED 3150. Philosophy and Methods of Contests**3 Credits (3)**

Covers the roles that career development events (contests) play in agricultural and technology education and in extension programs. Topics include competition and cooperation, winning and losing, ethics, use of community resources, and academic and employability skills taught through contests. Coaching as a teaching method is introduced and expanded. Students will assist with the coordination of various career development events. May be repeated up to 3 credits.

AXED 3210V. John Muir: Lessons in Sustainability**3 Credits (3)**

This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influenced his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable future. May be repeated up to 3 credits.

AXED 3996. Special Topics**1-4 Credits (1-4)**

Course addresses specific subjects and issues as identified by department. Topics and credits to be announced in the Schedule of Classes. Students can only take up to 4 credits per semester and no more than 6 credits of the course may be applied to a degree. May be repeated up to 12 credits.

Learning Outcomes

1. Various

AXED 4110. Management of Change, Diffusion, and Adoption of Innovations**3 Credits (3)**

Factors that influence the rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations.

Taught with AXED 5110. May be repeated up to 3 credits.

Learning Outcomes

1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 4210. Curriculum Development and Assessment in Agricultural Education**3 Credits (3)**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.

Prerequisite: 2.5 GPA.

AXED 4215. Developing Excellent Programs in Career and Technical Education**3 Credits (3)**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability for the program are discussed. May be repeated up to 3 credits.

AXED 4220. Methods for Teaching Agricultural and Technology Education**3 Credits (3)**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. May be repeated up to 3 credits.

Prerequisite: GPA of 2.5 or above.

AXED 4230. Directed Teaching in Agricultural or Technology Education**15 Credits (15)**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural or technology education supervising teachers. Consent of Instructor required.

Prerequisite: AXED 4215, AXED 4220 and consent of instructor.

AXED 4235. Directed Teaching in Extension Education**3-12 Credits (3-12)**

Four-to-fourteen-week, professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Consent of instructor required. May be repeated up to 12 credits.

AXED 4510. Introduction to Research Methods**3 Credits (3)**

Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Students must be in junior standing to enroll. May be repeated up to 3 credits.

AXED 4520. Methods in Career and Technical Laboratory Instruction**2 Credits (2)**

For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors. May be repeated up to 2 credits.

AXED 4610. Leadership On Agricultural and Natural Resource Issues**3 Credits (3)**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. May be repeated up to 3 credits.

AXED 4620. Methods of Teaching Biological, Earth and Physical Sciences in Agriculture**3 Credits (3)**

Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered focus on incorporating biological, earth and physical sciences into agricultural instruction and may include: Tissue culture, animal anatomy, hydroponics microscopy, electrophoresis, microbiology, soils and plant nutrients, water quality, water systems, entomology, integrated pest management, and renewable energy applications. Students develop their own modules and/or experiments.

AXED 4710. 4-H Youth Development**1 Credit (1)**

On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension. May be repeated up to 1 credit.

AXED 4715. The FFA Organization: An Overview**1 Credit (1)**

Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education. May be repeated up to 1 credit.

AXED 4991. Undergraduate Research**1-4 Credits (1-4)**

Research experience in agricultural, extension, and technology education with applications to selected issues and problems. May be repeated up to 4 credits.

AXED 4997. Independent Study in Agricultural, Extension, or Technology Education**1-3 Credits (1-3)**

Specific subjects are agreed upon by the student and instructor. Students must be juniors or seniors to enroll. May be repeated up to 6 credits.

AXED 5110. Management of Change, Diffusion, and Adoption of Innovations**3 Credits (3)**

Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 4110 with differential assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 5130. Advanced Agricultural Mechanization**3 Credits (3)**

This course provides an overview of advanced agriculture mechanization techniques and concepts. Precision farming tools and applications will be introduced, and hands-on activities will be utilized. A discussion about applications and benefits will frame the course lectures.

Learning Outcomes

1. Describe and classify various precision agriculture software/hardware technologies
2. Demonstrate usage of various precision agriculture technologies
3. Understand decision making processes associated with implementation of precision agriculture technologies
4. Analyze the costs, time, and application of precision agriculture technologies

AXED 5150. Strategic Communications Campaigns and Evaluation**3 Credits (3)**

Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple channels (e.g., written, visual, social). Students will also evaluate the materials for their audience reach, visibility, and effectiveness. Strategic communications involve planning, prioritizing, and evaluating. Students will gain experience implementing these needs with a real-world client to keep materials relevant to industry demands. May be repeated up to 3 credits.

Learning Outcomes

1. Identify communications-related needs with a client or stakeholder in the food, agricultural, natural resources, and human (FANH) sciences.
2. Define priority communications areas to address client or stakeholder needs.
3. Direct a communications plan with channels, tactics, steps, and timelines.
4. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
5. Evaluate the reach, visibility, and effectiveness of the communications materials.
6. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.
7. Publish portfolio materials showcasing the client's brand.

AXED 5155. Youth Program Development and Management**3 Credits (3)**

Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Taught with AXED 415 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5160. Teaching Adults in Nonformal Settings**3 Credits (3)**

The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Taught with AXED 430 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5165. History and Philosophy of Agricultural and Extension Education**3 Credits (3)**

History and Philosophy of Agricultural and Extension Education serves as a foundational core of graduate studies in Agricultural and Extension Education. The design of the course is to acquaint the student with a broad perspective of cultural and historical conditions that have shaped both education and agricultural education as we know it today. The primary purpose of this course is to explore the nature of selected philosophical concepts and philosophers and to evaluate their influence upon education and agricultural/extension education in the United States. In addition to philosophical influences, students will examine the historical events and governmental laws and policies that have evolved and developed our educational system of today.

Learning Outcomes

1. Understand the principles of philosophy in education and agricultural and extension education.
2. Recognize the influence of philosophers and philosophical documents upon education and agricultural and extension education.
3. Analyze the historical foundations that have established our modern educational system.
4. Develop a personal philosophy regarding education and agricultural education.

AXED 5170. Keys for Agricultural and Rural Development**3 Credits (3)**

Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally. May be repeated up to 3 credits.

AXED 5210. Curriculum Development and Assessment in Agricultural Education**3 Credits (3)**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.

Prerequisite: 2.5 GPA.

AXED 5215. Developing Excellent Programs in Career and Technical Education**3 Credits (3)**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Taught with AXED 445 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5220. Methods for Teaching Agricultural and Technology Education**3 Credits (3)**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Taught with AXED 446. May be repeated up to 3 credits.

Prerequisite: GPA of 3.0 or above.

AXED 5230. Directed Teaching in Agricultural or Technology Education**4-9 Credits (4-9)**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Students need to have completed a teaching methods class prior to enrolling in this course. Consent of Instructor required.

AXED 5235. Directed Teaching in Extension Education**4-9 Credits (4-9)**

Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Taught with AXED 448 with reduced credit hours for graduate students. Restricted to AXED majors. May be repeated up to 9 credits.

AXED 5310. New Mexico Water Issues**3 Credits (3)**

Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated. May be repeated up to 3 credits.

AXED 5320. Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences**3 Credits (3)**

The purpose of this course is to introduce risk and crisis as interdisciplinary concepts, reviewing theoretical frameworks from a variety of fields and perspectives, such as communication, social psychology and public relations. Students will develop a theoretical understanding of all aspects of strategic communication pertaining risks. Using readings and reflective writings, you will understand how individuals cognitively process risks and how to leverage trust and knowledge to facilitate public understanding. In addition, you will learn crisis communication and management from an organizational perspective. Using case studies and discussions, students will be able to recommend strategies for managing crises occurred to agricultural and natural resource industries.

Learning Outcomes

1. Develop a critical understanding of theoretical and conceptual frameworks related to risk and crisis communications
2. Use an integrated framework to analyze the communication strategies used by the agricultural and natural resource industries
3. Recommend effective and ethical strategies for managing actual and potential crises

AXED 5510. Research Methods**3 Credits (3)**

Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. May be repeated up to 3 credits.

AXED 5515. Data Collection and Analysis**3 Credits (3)**

Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended. May be repeated up to 3 credits.

AXED 5610. Leadership on Agricultural and Natural Resource Issues**3 Credits (3)**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students. May be repeated up to 3 credits.

AXED 5615. Effective Management of Volunteer Programs**3 Credits (3)**

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. May be repeated up to 3 credits.

AXED 5993. Workshops in Agricultural, Extension, and Technology Education**1-3 Credits (1-3)**

Workshop procedures applied to current trends in agricultural, extension, and technology education. A maximum of seven credits will count towards a degree. May be repeated up to 7 credits.

AXED 5994. Creative Component**1-4 Credits (1-4)**

For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. A maximum of six credits will count towards a degree. May be repeated up to 88 credits.

AXED 5996. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Students can take only a maximum of four credits per semester and no more than six credits will count towards a degree. May be repeated up to 6 credits.

AXED 5998. Internship/Cooperative Experience**1-6 Credits (1-6)**

Supervised professional on-the-job learning experience. May be repeated up to 6 credits.

AXED 5999. Master's Thesis**1-6 Credits (1-6)**

Thesis. May be repeated up to 88 credits.

Agricultural Communication Courses

ACOM 1110. Introduction to Agricultural Communication**3 Credits (3)**

Students will learn about the history and theories of agricultural communications, be introduced to the degree program, explore careers in the field, and examine the role of media in agricultural communications. May be repeated up to 3 credits.

Learning Outcomes

1. Identify classes needed in the degree program and relevant clubs.
2. Recall important times in history of agricultural communication and journalism.
3. Comprehend the communication process and identify its components.
4. Identify effective and efficient media for agricultural communication.
5. Analyze the various roles and uses of media in agriculture communication.
6. Apply theories of communication and journalism to class assignments.

ACOM 1120. Introduction to Graphic Design in Agriculture**3 Credits (3)**

This course focuses on introducing students to creating and critiquing visual communication materials in agricultural communications by developing understanding of visual communications, graphic design and branding principles as well as basic skills in using Adobe Illustrator and Photoshop software.

Learning Outcomes

1. Understand and demonstrate the correct use of formats, modes, and resolutions when creating or using graphics for various mediums and audiences.
2. Critique and evaluate graphic and photographic design elements in agricultural communications pieces.
3. Demonstrate a working knowledge of the Adobe Illustrator and Photoshop software and their uses for implementing principles of graphic design and branding.

**ACOM 1130G. Effective Leadership and Communication in Agriculture
3 Credits (2+2P)**

Theory and practice in leadership and communication for professionals who must work effectively in leadership and supervisory roles with people in agricultural business, industry, government agencies, and education. Course focuses on contemporary leadership theories. Oral communication skills in informative and persuasive speaking, parliamentary procedure, and for small groups are developed. May be repeated up to 3 credits.

Learning Outcomes

1. Understanding Leadership: Definitions of Leadership; Agricultural Education, FFA, Leadership; Leadership Categories; Democratic, Authorization, and Situational Leadership; Personality and Leadership Relations; Developing Leaders; Personal Leadership Development; Ability, Experience, and the Opportunity to Lead; Leadership in the Workplace; Human Relations, Technical, and Conceptual Skills
2. Communication Skills: Communication and Leadership; The Purpose of Communication; Forms of Communication; Communication Barriers and Styles; Verbal and Nonverbal Communication; Feedback; Self Communication and Interpersonal Communication
3. Leading Individuals and Groups: Group Dynamics and Team Building; Democratic Group Leadership; Importance of Groups; Types of Groups; Organizing Groups; Group Dynamics, Development, and Discussion
4. Conducting Successful Meetings: Skills Developed by Bring an Officer; Basic Meeting Functions; Characteristics of a Good Meetings; Planning and Preparing for Meetings; The Meeting Room; Committees; Informative and Motivational Meetings; Group Member Involvement; Officer and Member Responsibilities; Developing a Program of Activities

**ACOM 2120. Photography in Agriculture
3 Credits (1+2P)**

This is a field-based course focused on how to students use the camera as a tool to make the rules of photography and design work for the student's style, creativity, and goals pertaining to application of photography in agricultural communications. Students develop and disseminate a photography portfolio through a variety of communications channels.

Learning Outcomes

1. Utilize a DSLR or mirrorless camera to analyze scenarios to effectively curate a body of work that compliments agricultural communications practice
2. Demonstrate working knowledge of camera equipment and photography principles to create visual stories
3. Evaluate and critique imagery for use of photography skills and principles

**ACOM 2998. Early Field- Based Experience in Agricultural Communications
1-4 Credits (1-4)**

This course is designed to help you understand people and how to communicate with people. The key to all journalism or communications-related courses is to understand the audience well enough to know how to speak like them, to them, and to your stakeholders. The most successful communicators exhibit greatness in themselves and in their peers. Communicators cannot do their job if they do not show up with their best attitude and work ethic. Don't let your audience down, and we will make sure you are equipped to do so. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications in the agricultural or science industries.
2. Develop a communication campaign for an agriculturally related client.
3. Identify key principles of communication channels including newswriting, radio production, and communication plans.
4. Create effective internship application materials to meet needs in the industry.
5. Design a job portfolio that includes examples of communications experience.

**ACOM 3110. Agricultural Communications
3 Credits (3)**

Principles and practical experience in news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities, especially as related to the fields of agriculture and family and consumer sciences.

**ACOM 3115. Global Issues in Agricultural Communications and Marketing
3 Credits (3)**

Global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate agricultural communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.

**ACOM 3125. Website User Experience Design in Agriculture
3 Credits (3)**

The purpose of this course is for students acquire user experience development, coding and web design skills in order to create a live personal portfolio website that demonstrates their professional skills and experiences in agriculture.

Learning Outcomes

1. Evaluate websites based on user experience principles
2. Use the fundamentals of HTML and CSS to edit code
3. Implement user experience principles in website design
4. Develop a website using WordPress
5. Explain and justify web design decisions

**ACOM 3150. Communications Campaigns in Agriculture
3 Credits (3)**

Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple modes (e.g., written, visual, social). Students in this course will gain an overall understanding of the agricultural communications industry by developing portfolio materials, prepare for the job and internship search process, and identify the skills necessary to grow in and contribute to a communications profession.

Learning Outcomes

1. Students will be able to identify communications-related needs with a client or stakeholder in the food, fiber, and natural resources industries.
2. Direct a communications plan with channels, tactics, steps, and timelines for a client.
3. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
4. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.

**ACOM 3160V. Communicating Agriculture & Science to the Public
3 Credits (3)**

Principles and practical experience in general communications channels (i.e., news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities) related to the fields of agricultural, consumer, or environmental sciences. Students in this course will gain an overall understanding of the agricultural communications industry and identify the skills necessary to grow in and contribute to a communications profession.

Learning Outcomes

1. Explain the role of communications in the agricultural, consumer, or environmental science industries.
2. Develop a communication campaign for an agricultural, consumer, or environmental science related client.
3. Identify key principles of communication channels including news writing, radio production, and communication plans.
4. Design a social media campaign including Instagram, Facebook, Twitter, and/or other emerging platforms.
5. Develop skills in media communications including public relations, conducting radio and television interviews, developing interview skills and identifying the needs of an audience.
6. Create effective internship application materials to meet needs in the industry.
7. Design a job portfolio that includes examples of communications experience.
8. Examine social, ethical, and legal issues related to communicating components related to the agricultural, consumer, and environmental science industries.
9. Conduct an audience analysis of key issue related to the agricultural, consumer, and environmental science industries by analyzing demographics, psychographics, sociographics, and geographics of affiliated audience personas.

**ACOM 4115. Agricultural and Scientific Publications
3 Credits (3)**

Learn and gain experience with the principles and concepts of designing, writing, editing, producing and distributing a student insert to the ACES Magazine, including practical applications of writing feature articles, magazine design, layout and graphics.

Learning Outcomes

1. Execute the steps necessary to be a freelance writer.
2. Identify feature story ideas, contact sources and develop publishable stories.
3. Compare and contrast the varying types of publication materials (connection/spotlights, feature stories, social media sprints, etc.).
4. Comprehend publication design principles and current practices used in print communication industries.
5. Create, produce, publish and publicize a print magazine.
6. Connect with an audience through soft news.

ACOM 4120. Advanced Graphic Design and Layout in Agriculture
3 Credits (3)

This class provides an in-depth examination of visual communication principles and theories, design applications, and design topics relevant to the agricultural industry. Students will learn how to more deeply evaluate designs and layouts, create effective design pieces for targeted agricultural audiences, and further utilize the Adobe Creative Cloud software.

Learning Outcomes

1. Analyze and apply the principles underlying effective graphic design and layout
2. Recognize and discuss communication and visual theories for developing effective designs and layouts for intended purposes and audiences
3. Demonstrate an extensive working knowledge of Adobe Illustrator, Photoshop, and InDesign to create effective designs for both print and digital platforms

ACOM 4130. Strategic Brand Identity & Design in Agriculture
3 Credits (3)

The purpose of this course is for students to develop extensive understanding of strategic and visual theory and principles specific to branding as a critical aspect of business development in all aspects of agriculture and natural resources. Students will utilize research and Adobe Creative Cloud to design targeted brand strategy, client brief, and design strategy to effectively build a client pitch.

Prerequisite: ACOM 1120.

Learning Outcomes

1. Articulate the significance of utilizing brand identity for differentiation
2. Apply extensive knowledge of visual and brand theory, principles, strategy and application to various contexts in agriculture and natural resources
3. Research, design and pitch a brand strategy, client brief and design strategy

ACOM 4998. Internship in Agricultural Communications
3-12 Credits (3-12)

The experiential learning experience selected by students and approved by their academic advisor will form the basis of this course. Students will apply problem-solving skills, communication skills, and disciplinary knowledge through an internship related to agricultural communications. During the internship, students will gain real-world experience in their specific field of interest within the discipline. May be repeated up to 12 credits.

Learning Outcomes

1. Synthesize discipline-specific knowledge and its application to real-world contexts
2. Design and implement solutions to meet project-related tasks
3. Produce professional-quality deliverables for the employer and for the course
4. Handle a high level of responsibility with professionalism and care in preparation and presentation

ACOM 5115. Global Issues in Agricultural Communications and Marketing
3 Credits (3)

Graduate-level course broadening global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.
7. Research and dissemination information regarding international issues in agriculture using critical thinking skills.

Name: Dr. Steve Frazee, Department Head

Office Location: Gerald Thomas Hall, Room 111

Phone: (575) 646-4511

Website: <http://aces.nmsu.edu/academics/axed> (<http://aces.nmsu.edu/academics/axed/>)

Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

This degree option includes a certificate in Creative Media Technology and a minor in either Journalism and Mass Communication or Communication Studies. See your academic advisor for more information.

Prefix	Title	Credits
General Education		
Area I: Communications		10
	English Composition - Level 1 ¹	
	English Composition - Level 2 ¹	
	Oral Communication ¹	
Area II: Mathematics ¹		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11

Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing A Wider World ²		6
Departmental/College Requirements		
ACES 1120	Freshman Orientation	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
ACOM 3110	Agricultural Communications	3
AXED 430		3
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
AXED 3210V	John Muir: Lessons in Sustainability (doesn't count as VWW credit)	3
AXED 4610	Leadership On Agricultural and Natural Resource Issues	3
Second Language: (not required)		
Electives, to bring the total credits to 120 ³		54-57
Total Credits		117

¹ See the General Education (p. 220) section of this catalog for a full list of courses

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

³ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
English Composition - Level 1 ¹		4
English Composition - Level 2 ¹		3
<i>Oral Communication</i>		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3

Area II: Mathematics ¹		3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
Area V: Humanities		
Choose one from the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		3
General Education Elective ¹		3-4
An additional Area II: Mathematics Course (for licensure purposes)		
Viewing A Wider World ³		6
ANSC 351V	Agricultural Animals of the World	
or EPWS 325V	Insects, Humans, and the Environment	
Choose one additional VWW Course from a College outside of the College of ACES		
GEOG 315V	World Agriculture and Food Problems (recommended)	
Departmental/College Requirements		
ACES 1120	Freshman Orientation	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
AXED 2130	Early Field-Based Experience	2
AXED 3150	Philosophy and Methods of Contests	3
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
AXED 4230	Directed Teaching in Agricultural or Technology Education	15
AXED 4520	Methods in Career and Technical Laboratory Instruction	2
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
AXED 4715	The FFA Organization: An Overview	1
READ 4330	Content Area Literacy	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Select 24-30 credits from the following: ²		24-30
Agricultural Economics (at least 3 credits)		
Agricultural Mechanics (at least 12 credits)		
Plant, Pest and Soil Sciences (at least 6 credits)		
Select at least 3 credits from one of the following areas:		
Animal Science		
Horticulture		
Natural Resources		
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		8-16
Total Credits		120

¹ See the General Education (p. 220) section of this catalog for a full list of courses

² ACOM 1130G Effective Leadership and Communication in Agriculture will also count towards the Departmental/College requirements of 24-30 credits.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ACES 1210	Financial Fitness for College Students	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
ENGL 1110G	Composition I ¹	4
AXED 1130	Techniques in Agricultural Mechanization	3
ACES 1120	Freshman Orientation	1
MATH 1215	Intermediate Algebra	3
Credits		15
Semester 2		
MATH 1220G	College Algebra ¹	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
AXED 2110	Metal Fabrication	3
ANSC 1120	Introduction to Animal Science	3
Choose from one of the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
Credits		15
Second Year		
Semester 1		
GEOL 1110G	Physical Geology	4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
ENGL 2210G	Professional & Technical Communication ¹	3
HORT 1115G	Introductory Plant Science	4
Credits		15
Semester 2		
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
AXED 4715	The FFA Organization: An Overview	1
AXED 3115	Small Engine Technology	3
PSYC 1110G	Introduction to Psychology	3
AXED 3150	Philosophy and Methods of Contests	3
AXED 2130	Early Field-Based Experience	2
Credits		15

Third Year

Semester 1

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
GEOG 315V	World Agriculture and Food Problems	3
AXED 3120	Agricultural Structures	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
AXED 4520	Methods in Career and Technical Laboratory Instruction	2
Credits		15

Semester 2

AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
AXED 4210	Curriculum Development and Assessment in Agricultural Education	3
READ 4330	Content Area Literacy	3
ANSC 310	Exhibiting Livestock	3
Credits		15

Fourth Year

Semester 1

AXED 4230	Directed Teaching in Agricultural or Technology Education	15
Credits		15

Semester 2

AEEC 2110	Principles of Food and Agribusiness Management	3
ANSC 304	Feeds and Feeding	3
EPWS 325V	Insects, Humans, and the Environment	3
READ 4330	Content Area Literacy	3
An additional Area II: Mathematics Course ²		3
Credits		15
Total Credits		120

¹ Students need to understand and complete any prerequisites prior to enrolling into this course.

² See the General Education (p. 220) section of this catalog for a full list of courses

Agricultural and Extension Education (Agricultural Extension/Community Development) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2¹</i>		3
<i>Oral Communication</i>		
ACOM 1130G	Effective Leadership and Communication in Agriculture (Departmental/College Requirement) ²	3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
AEEC 2130G	Survey of Food and Agricultural Issues	3
<i>Area V: Humanities</i>		
Choose one from the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
<i>Area VI: Creative and Fine Arts</i>		
MUSC 1130G	Music Appreciation: Western Music	3
<i>General Education Elective¹</i>		
PSYC 1110G	Introduction to Psychology	3
Viewing A Wider World³		6
ANSC 351V	Agricultural Animals of the World	
or EPWS 325V	Insects, Humans, and the Environment	
Choose one additional VWW Course from a College outside of the College of ACES		
GEOG 315V	World Agriculture and Food Problems (recommended)	
Departmental/College Requirements		
ACES 1120	Freshman Orientation	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
AXED 2110	Metal Fabrication	3
AXED 2130	Early Field-Based Experience	2
AXED 3120	Agricultural Structures	3
AXED 3130	Advanced Technology in the Agricultural Mechanization	3
AXED 3150	Philosophy and Methods of Contests	3
AXED 4110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
AXED 4235	Directed Teaching in Extension Education	12
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
AXED 4710	4-H Youth Development	1
Agriculture Courses 42-48 credits from the following: ²		
Agricultural Communications		
ACOM 1110	Introduction to Agricultural Communication	3
ACOM 3110	Agricultural Communications	3

Agricultural Economics		
AEEC 305	Marketing and Food Agricultural Products	3
AEEC 315V	World Agriculture and Food Problems	3
Agricultural Mechanics		
Plant, Pest and Soil Sciences		
EPWS 302	General Entomology	4
Animal Science		
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
ANSC 2340	Genetics in Animal Science	3
ANSC 304	Feeds and Feeding	3
ANSC 310	Exhibiting Livestock	3
Horticulture		
HORT 1115G	Introductory Plant Science	4
Second Language: (not required)		
Agronomy Elective or other Ag Elective, to bring the total credits to 120⁴		5
Total Credits		120

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ACES 1120	Freshman Orientation	1
ENGL 1110G	Composition I ¹	4
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
ACOM 1110	Introduction to Agricultural Communication	3
HORT 1115G	Introductory Plant Science	4
Credits		15

Semester 2

MATH 1220G	College Algebra ¹	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
AXED 2110	Metal Fabrication	3
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
Choose from one of the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
Credits		16

Second Year

Semester 1

CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
ENGL 2210G	Professional & Technical Communication ¹	3
ANSC 2340	Genetics in Animal Science	3
MUSC 1130G	Music Appreciation: Western Music	3
AXED 4710	4-H Youth Development	1
Credits		14

Semester 2

AXED 4215	Developing Excellent Programs in Career and Technical Education	3
PSYC 1110G	Introduction to Psychology	3
AEEC 2130G	Survey of Food and Agricultural Issues	3
AXED 2130	Early Field-Based Experience	2
EPWS 302	General Entomology	4

Credits	15
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Third Year**Semester 1**

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
GEOG 315V	World Agriculture and Food Problems	3
AXED 3120	Agricultural Structures	3
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
AEEC 305	Marketing and Food Agricultural Products	3

Credits	16
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Semester 2

AXED 4220	Methods for Teaching Agricultural and Technology Education	3
ANSC 310	Exhibiting Livestock	3
AEEC 315V	World Agriculture and Food Problems	3
AXED 3150	Philosophy and Methods of Contests	3
ACOM 3110	Agricultural Communications	3

Credits	15
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Fourth Year**Semester 1**

EPWS 325V	Insects, Humans, and the Environment	3
Elective Courses		5
ANSC 304	Feeds and Feeding	3
AXED 3130	Advanced Technology in the Agricultural Mechanization	3

Credits	14
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Semester 2

AXED 4235	Directed Teaching in Extension Education	12
AXED 4110	Management of Change, Diffusion, and Adoption of Innovations	3

Credits	15
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Total Credits	120
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Agricultural and Extension Education - Undergraduate Minor

The department offers a minor in agricultural and extension education, which may be earned by completion of 18 credits in the department. The minor must include 9 credits of upper-division courses.

Agricultural and Natural Resource Leadership - Undergraduate Minor

The department offers a minor in agricultural and natural resource leadership, which may be earned by completing

Prefix	Title	Credits
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Required Courses

Leadership Related Courses in the Department of Agricultural and Extension Education	12
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Leadership Related Course from Outside the Department of Agricultural and Extension Education	3
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Agricultural or Natural Resource Policy Course	3
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Total Credits	18
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The minor must include 9 credits of upper division courses.

Agricultural Economics and Agricultural Business

Undergraduate Program Information

The Department of Agriculture Economics and Agricultural Business offers two Bachelor of Science in Agriculture degrees. A Bachelor of Science in Agriculture with a major in Agricultural Economics and Agricultural Business (AEAB) and a Bachelor of Science in Agriculture with a major in Natural Resource Economics and Policy (NREP).

Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture

The AEAB degree prepares students for supervisory and management positions with companies that operate in the food and fiber supply chain. Positions may focus on areas of agribusiness management, agricultural production, financing, marketing, and economics. Recent AEAB graduates have accepted positions with national and international companies, non-profits, and government agencies.

In this program, faculty, students, and industry stakeholders work together to provide students with real-world examples and opportunities to apply their skills and knowledge through departmental course offerings. The curriculum is designed to educate students as business professionals with the necessary skills to succeed in professional positions. Depending on their interest, students can customize their path of study to include additional courses in marketing, finance, or natural resource management.

Natural Resource Economics and Policy - Bachelor of Science in Agriculture

The Department of Agriculture Economics and Agricultural Business offers the Bachelor of Science in Natural Resource Economics and Policy (NREP); an undergraduate degree that trains students on the socio-economic and bio-physical aspects of environmental and natural resource management and policy. With increasing competition for limited land, water, and other natural resources in the U.S. and throughout the world, as well as growing concern about environmental degradation, there is a growing need for professionals who can assist in the process of balancing economic and environmental tradeoffs. The NREP major provides students with knowledge and skills to articulate and apply economic principles to a range of public and private sector issues such as land use, energy, wildlife, climate and air resources, and water. This major prepares students for private and public sector positions in resource assessment, management, or administration.

Graduate Program Information

The Department of Agricultural Economics and Agricultural Business supports five graduate programs. Several of these programs are offered

with cooperation from other departments on campus. The five degrees supported by AEAB include:

- Masters of Science in Agricultural Economics;
- Masters of Agriculture with a concentration in agribusiness;
- Masters of Business Administration with a concentration in agribusiness;
- Doctorate of Economic Development; and
- MS & Ph.D. in Water Science Management.

Masters of Science in Agricultural Economics

Master of Science (MS) in Agricultural Economics program provides rigorous training in economic theory, applied economic analysis, and quantitative methods. The degree and curriculum are designed to prepare students for professional careers in business, government, research, and for continued education in pursuit of a Ph.D. The program requires students to complete a Master's thesis working closely with a faculty committee.

Masters of Agriculture with a concentration in Agribusiness

Master of Agriculture (MAG-AB) with a concentration in Agribusiness provides students with backgrounds or interests in agriculture with graduate-level training in agribusiness and applied economics. Students are able to develop knowledge and skills related to applied economics, finance, marketing, management, and quantitative methods and skills commonly used in managing businesses operating within the food and fiber value chain. The degree offers an alternative for individuals holding undergraduate degrees in various agricultural and food science fields to learn and develop skills needed to start or manage an agricultural business. The program requires students to complete a creative component or thesis working closely with a faculty committee. Courses are offered in a hybrid format allowing students not living in or near Las Cruces to participate in the program.

Masters of Business Administration with a concentration in Agribusiness

Master of Business Administration with a concentration in Agribusiness (MBA-AB) prepares students for business and public sector careers in agriculture and the food and fiber industry. Graduates from this program are knowledgeable about the U.S. and international food and fiber sectors and hold an AACSB International accredited MBA degree.

Doctor of Economic Development

Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

Interdisciplinary Masters in Water Science and Management and Ph.D. in Water Science and Management

The Water Science program is an interdisciplinary program supported by AEAB faculty that provides graduate education for the next generation of water resources researchers, educators, and managers. The program provides knowledge and tools that can be used to address state, national, and international water challenges including water quality, quantity, timing/availability, and location of water resources.

Degrees for the Department Bachelor Degree(s)

- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 297)
- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 300)

Master Degree(s)

- Agricultural Economics - Master of Science (p. 94)
- Agriculture (Agribusiness) - Master of Agriculture (p. 91)
- Agriculture (Agribusiness) - Master of Agriculture (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/agriculture-agribusiness-mag-online/>)

Doctoral Degree(s)

- Economic Development - Doctor of Economic Development (p. 183)

Minors for the Department

- Agricultural Business Management- Undergraduate Minor (p. 301)
- Natural Resource Economics - Undergraduate Minor (p. 302)

Professor, Steven Frazee, Interim Department Head

Professors Hurd, Lillywhite, Ward

Associate Professors Acharya, Patrick

Assistant Professors Boufous, Dsouza, Miller, Regmi, Robinson, Torell

College Professors Townsend

Department of Agricultural Economics and Agricultural Business:

S. Frazee, Interim Department Head, Ph.D. (Texas A&M)– agricultural communications, agricultural education, agricultural extension; Professors B. H. Hurd, Ph.D. (California-Davis)– water and natural resource economics; J. Lillywhite, Ph.D. (Purdue)– food and agribusiness management and marketing; F. A. Ward, Ph.D. (Colorado State)– resource economics, welfare economics; Associate Professors R.N. Acharya, Ph.D. (Auburn)– food safety, logistics management, technology adoption, and marketing; M. Patrick, Ph.D. (Michigan State University)– Economic Development; Assistant Professors S. Boufous, Ph.D. (Texas Tech University)- sustainability, production economics, consumer demand analysis, and non-market valuation; A. Dsouza, Ph.D. (Arizona State University)- production economics, food supply chain management, and marketing; F. Miller, Ph.D. (University of Texas-Dallas)- agricultural economics, policy, dairy, range livestock; M. Regmi, Ph.D. (Kansas State University)- agricultural finance, risk management, production economics; C. Robinson, Ph.D. (New Mexico State)- consumer behavior, agricultural production, marketing sales; G. Torell, Ph.D. (University of Wyoming)- agricultural economics, natural resources, environmental economics; College Professors J. Townsend, Ph.D. (Oklahoma State University) commodity risk management, agricultural marketing; Affiliated Faculty D. Blayney, Ph.D. (Washington State University) agricultural supply chain; dairy production; Emeritus Faculty V. Bullock M.S. (Emeritus) (New Mexico State University) real estate, real estate appraisal; P. Gutierrez, Ph.D. (Emeritus) (Oklahoma State)– extension, ranch economics, economic development; J. D. Libbin, Ph.D. (Emeritus) (Iowa State)– farm management, production economics; R. Skaggs, Ph.D. (Emeritus) (Utah State)– agriculture and natural resource policy;

Department of Economics, Applied Statistics and International Business:

C. A. Erickson, Department Head, Ph.D. (Arizona State)-economic development, monetary theory, macroeconomics; **Professors** D. L. Daniel, Ph.D. (Southern Methodist)-nonparametrics; C. Enomoto, Ph.D. (Texas A&M)-econometrics, economic theory; D. A. Gegax, Ph.D. (Wyoming)-public utility economics, industrial organization; W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation; Y. F. Lee, Ph.D. (Southern Illinois-Carbondale)-international finance, international trade, international system, economic development; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions; D. M. VanLeeuwen, Ph.D. (Oregon State)-statistics; **Associate Professors** L. Blank, Ph.D. (Tennessee, Knoxville)-microeconomic theory, managerial economics, regulatory economics; C. Gard, Ph.D. (Washington)-biostatistics; R. McFerrin, Ph.D. (Texas A & M)-micro theory, American economic history; B. Widner, Ph.D. (Colorado State)-urban/regional, public finance, development; **Assistant Professors** B. Bai, MS (New Mexico State)-applied statistics; J. Bucheli, Ph.D. (New Mexico)-migration, economic development; L. LaPlue (Tennessee)-international and environmental economics; M. Li, Ph.D. (Pennsylvania State), ; J. Mamkhezri, Ph.D. (New Mexico)-energy, natural resources, environmental; C. Sroka (Ohio State)-count data models; P. J. Trainor, Ph.D. (Louisville)-biostatistics, bioinformatics, Bayesian statistics **Emeritus Faculty** R. V. Adkisson, Ph.D. (Nebraska)-international, public finance, economic development; K. Brook, Ph.D. (Texas-Austin)-macroeconomic theory, monetary policy; D.L. Clason, Ph.D. (Kansas State); M. Ellis, Ph.D. (California-Riverside); B. N. Matta, Ph.D. (Texas-Austin); J. T. McGuckin, Ph.D. (Wisconsin-Madison); J. T. Peach, Ph.D. (Texas-Austin)-quantitative economics, border studies, economic development; A.V. Popp, Ph.D., (Northern Illinois); D.B. Smith, Ph.D., E. S. Willman, Ph.D. (Indiana)

Agricultural Economics Courses

AEEC 1110. Introduction to Agricultural Economics and Business 3 Credits (3)

This course is an orientation to agricultural economics and business through the discovery process for the consumer in the food, fiber, and natural resource sectors of the global economy. The course discusses the application of micro-and macro-economic principles as they relate to agricultural economics and business. May be repeated up to 3 credits.

Learning Outcomes

1. Gain a broad understanding of the role of the consumer in the market-place for agricultural commodities, producers, agencies and the global market structure.
2. Apply introductory economic principles to applied global situations.
3. Employ economic concepts in the application of production level decision making.
4. Employ economic principles to the basic and global agricultural community.
5. Understand relationships that exist between producers and consumers.

AEEC 1120. Careers in Food and Agribusiness

1 Credit (1)

This course provides an orientation to careers in agricultural economics and agricultural business. Students will learn about the agricultural supply chain in New Mexico, the United States, and the world. Students will be introduced to faculty and staff within the department, learn about career opportunities available to AEAB graduates, and develop a greater appreciation of current agricultural issues. Freshman status or consent of instructor required. May be repeated up to 1 credit.

Learning Outcomes

1. Become familiar with career opportunities in agricultural economics and agricultural business
2. Understand knowledge and skills desired by employers
3. Become acquainted with faculty and staff in the Department of Agricultural Economics and Agricultural Economics and resources available to students within the Department
4. Refine written and verbal communication skills

AEEC 2110. Principles of Food and Agribusiness Management

3 Credits (3)

This course introduces business management theory and application of theory related to businesses within the food and fiber supply chain. Topics include management and financial principles, market planning, and organization theory. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate, refine and expand written and oral communication skills
2. Develop an understanding of basic financial statements, their use and analysis
3. Understand the roles management and management styles play in modern agribusiness
4. Learn about the history of agribusiness domestically and internationally
5. Integrate the role of technology into modern agribusiness management

AEEC 2120. Introduction to Food and Agribusiness Accounting

3 Credits (3)

This course outlines the purpose and methods of keeping and analyzing farm and ranch records. Course topics include financial statements, efficiency measures, analysis of the business, and tax computations.

Learning Outcomes

1. Understand the terminology and principles used in modern farm and ranch financial management statements.
2. Evaluate capital investments, analyze farm business performance, and develop tools for financial planning and analysis
3. Evaluate farm and ranch cash flows

AEEC 2130G. Survey of Food and Agricultural Issues**3 Credits (3)**

Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with: FSTE 2130G.

Learning Outcomes

1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulate modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

AEEC 2140. Technology and Communication for Business Management**3 Credits (2+2P)**

This course helps students improve their skills related to data analysis, information management, and communication. Drawing examples from a variety of management, business, technological and research situations, students discover the versatility and functionality of modern computer software. The course emphasizes a 'hands-on' approach. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding terms used to describe common techniques and concepts in business information systems.
2. Demonstrate mastery of spreadsheet design and use.

AEEC 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. Consent of instructor required.

Learning Outcomes

1. Varies

AEEC 300. Internship**1-4 Credits (1-4)**

Professional work experience under the supervision of a faculty member. May be repeated up to 6 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

Prerequisite(s): Consent of instructor.

AEEC 305. Marketing and Food Agricultural Products**3 Credits (3)**

This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. May be repeated up to 3 credits.

Crosslisted with: MKTG 305.

Prerequisite(s): ECON 1110G or ECON 2120G.

Learning Outcomes

1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations
4. Know the basic outline and components of a marketing plan

AEEC 311. Financial Derivative Markets**3 Credits (3)**

This course explores the role of financial derivatives in modern business, including income generation, risk management, and price discovery.

Derivatives markets covered in the course include futures, options, and swaps. Course content focuses on the fundamentals of trading and hedging in a wide variety of markets, e.g., agriculture, interest rates, exchange rates. Students participate in simulated futures and options trading. Same as AEEC/BFIN 511 with additional coursework required at the graduate level. Cannot receive credit for both AEEC/BFIN 311 and AEEC/BFIN 511. Same as BFIN 311.

Learning Outcomes

1. Understand and explain the concept of risk, list various sources of risks observed in businesses, and identify common methods used to manage risk
2. Demonstrate an understanding of the vocabulary associated with derivatives and derivative markets
3. Articulate the role that derivative markets play in reducing risk and illustrate how they can be used in practice to reduce risk
4. Illustrate how derivative markets can be used to generate income and manage risk through hedging

AEEC 313. Food and Agricultural Sales**3 Credits (3)**

This course reviews the techniques of salesmanship. Course topics include identification and classification of buyer type and different approaches to sales based on client base. Improving oral communication skills through individual and/or group sales presentations. Students must be in Junior or above standing to enroll.

Learning Outcomes

1. Analyze sales situations and effectively identify pathways to closing the sale
2. Demonstrate execution of the sales process – prepare, learn, communicate, evaluate
3. Conduct product and customer analysis to build a sales strategy
4. Exhibit enhanced relationship management and communication skills

AEEC 314. Agricultural and Natural Resource Law**3 Credits (3)**

This course discusses the relationship of common-law principles, statutory law and regulatory law to problems involving agriculture with an emphasis on New Mexico issues. Legal problems relevant to agribusiness, torts, fencing laws, liability for agricultural pollution, irrigation water rights, corporations and partnerships, land tenure, farm and ranch tenancy, agricultural labor, farm and ranch management, and taxation.

Learning Outcomes

1. Understand the complexity of law as it relates to agriculture and natural resources
2. Develop a basic understanding of the legal system in the U.S. including the role of federal and state agencies responsible for agricultural and natural resource regulation
3. Articulate at a layperson's level, the roles of the legislative, judicial, and executive branches of the government as they relate to agriculture and natural resources.

AEEC 315V. World Agriculture and Food Problems**3 Credits (3)**

This course examines key concepts and issues relevant to the world's food production systems. Topical highlights include the causes and consequences of hunger, agriculture's economic and environmental significance, sustainable development, biotechnology, and globalization of agricultural markets. As students learn about these issues from both local and global perspectives they are engaged in the development of both their literacy of economic concepts and their core research and communication skills. We do this through a combination of relevant course readings, in-class discussion exercises, and focused writing assignments on current issues of relevance. Same as GEOG 315V. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate conceptual and systems thinking and design
2. Assess the nutrition and healthfulness of food choices
3. Describe the structure and function of food and agricultural systems
4. Analyze roles of and relationships between food producers, consumers, and policymakers
5. Apply basic economic concepts to describe and interpret food and agricultural issues
6. Explain the environmental context and role of agriculture
7. Articulate key arguments that favor and oppose food biotechnology
8. Recognize several of the benefits and barriers in international trade of food and agricultural products

AEEC 337V. Natural Resource Economics**3 Credits (3)**

This course helps students gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as ECON 337V. May be repeated up to 3 credits.

Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

Learning Outcomes

1. Demonstrate knowledge of economic principles to better understand natural resource issues
2. Document understanding of current and emerging natural resource issues
3. Apply economic principles to guide selected natural resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 340. Economics of Food and Agricultural Markets**3 Credits (3)**

This course focuses on the analysis of supply and demand characteristics of commodities with particular attention to agricultural products. Pays special attention to empirical analysis. Includes institutional aspects of pricing, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions.

Prerequisite: ECON 2120G, MATH 1430G, and A ST 311 or MATH 1350G.

Learning Outcomes

1. Become familiar with commonly used data analysis methods and tools
2. Develop an understanding of the factors that influence agricultural prices
3. Use data to analyze and solve real-world problems related to agricultural prices

AEEC 342. Economic Analysis of Food and Agribusiness**3 Credits (3)**

This course uses economic and business theory to analyze business decision making. The course includes a discussion of economic, managerial, and financial considerations relevant to modern agribusinesses.

Prerequisite: ECON 2110G, ECON 2120G.

Learning Outcomes

1. Understand the role of managers within the food and fiber supply chain
2. Develop an understanding of the applications of managerial economics as they related to businesses within the food and fiber supply chain
3. Analyze market conditions and assess the position of a business within the market
4. Identify and articulate optimal business decisions by analyzing economic and business information

AEEC 350. Spreadsheet Applications in Food and Agriculture
3 Credits (2+2P)

This course is an advanced course in electronic spreadsheets. Concepts and tools of data analysis and database management within a spreadsheet, emphasizing agricultural applications, are presented.

Prerequisite: AEEC 2140 or consent of instructor.

Learning Outcomes

1. Ability to effectively utilize some of the advanced features in Microsoft Excel by course end
2. Transforming agricultural and agribusiness problems into spreadsheet models for analysis
3. Increase critical thinking capacity with respect to solving problems/tasks
4. Develop creativity in solving problems/tasks

AEEC 384V. Water Resource Economics
3 Credits (3)

This course uses economic principles to evaluate current and emerging issues in water resources. Applications focus on the use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as ECON 384V. May be repeated up to 3 credits.

Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

Learning Outcomes

1. Demonstrate knowledge of economic principles to better understand water resource issues
2. Show understanding of current and emerging water issues
3. Apply economic principles to guide selected water resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 385. Applied Production Economics
3 Credits (3)

This course introduces students to fundamental economic theories and analytical tools required for managing an agricultural operation. In particular, the principles of microeconomics will be reviewed and applied to the problems faced by farms and ranches. The course focuses only on economic making at the farm or ranch level.

Prerequisite: (ECON 2120G or ECON 2120H) and (MATH 1430G) and (A ST 311 or MATH 1350G).

Learning Outcomes

1. Analyze production function and calculate the total, average, and marginal products
2. Derive profit-maximizing input and output combinations
3. Evaluate the relationship between production, revenue, and profit functions
4. Analyze crop budgets and determine optimal acreage allocation
5. Measure the impact of risk and uncertainty on agricultural production

AEEC 400. Senior Seminar
1 Credit (1)

This course focuses on current topics and cases in the agribusiness literature stressing rigorous qualitative analysis of current problems and policy issues. During the course, students provide feedback about their experience within the Department and help identify ways in which the Department can improve. Restricted to: AEAB; NREP majors. Must be Senior standing to enroll.

Learning Outcomes

1. Illustrate an understanding of economic and business concepts as illustrated and applied in case analyses
2. Articulate ways in which the Department can improve academically
3. Prepare future steps in careers, e.g., resumes, cover letters, mock interviews
4. Develop interpersonal communication skills

AEEC 420. Special Problems
1-3 Credits

Special problems in agricultural economics or agricultural business of particular interest to the individual student. Maximum of 3 credits per semester. No more than 6 credits toward degree. Consent of instructor required.

AEEC 425. Food and Agribusiness Financial Management
3 Credits (3)

This course provides a description and application of techniques and principles of financial management to problem situations faced by agricultural businesses, including financial statement development and analysis, capital budgeting, sources and costs of capital.

Prerequisite: ECON 2120G or ECON 2120H and ACCT 2110.

Learning Outcomes

1. Understand the time value of money and perform capital investment analysis for agricultural firms
2. Interpret financial statements used by agricultural firms
3. Comprehend farm financial risks and returns
4. Discuss financing options for U.S. farm businesses

AEEC 445V. Agricultural Policy
3 Credits (3)

This course provides a historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making, and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts.

Prerequisite: (ECON 2110G or ECON 2110H) and (ECON 2120G or ECON 2120H).

Learning Outcomes

1. Apply economic concepts to deepen understanding of agricultural policy, particularly with regard to macroeconomic importance to agriculture
2. Describe inherent tradeoffs and opportunity costs in policy
3. Identify the global impacts of U.S. agricultural policy
4. Explain and describe important agricultural policy issues for a lay audience

AEEC 451. Food and Agribusiness Market Assessment 3 Credits (3)

This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: MKTG 451.

Prerequisite(s): AEEC 305 or MKTG 305 or consent of instructor.

Learning Outcomes

1. Identify, organize and conduct market research specific to the project
2. Develop an understanding of primary and secondary research collection and analysis
3. Exhibit enhanced relationship management, communication skills, and team building
4. Develop written communication with final deliverable for implementation into the business world

AEEC 452. Food and Agribusiness Marketing Plan Development 3 Credits (3)

This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions.

Learning Outcomes

1. Illustrate abilities to make decisions based on market research and analysis, including financial analysis, analysis of consumer trends, and the business environment
2. Create professional marketing and business presentation
3. Build effective teams to analyze and present real-world marketing opportunities
4. Practice business decision making founded on evidence from market research

AEEC 456. Case Studies in Food and Agribusiness Management 3 Credits (3)

This course integrates production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in the management of agricultural businesses using a decision case approach. Student must be in Senior standing to enroll in this course.

Learning Outcomes

1. Exhibit an ability to understand complex and varying business and resource issues, including financial analysis, natural resource issues, and business operations
2. Provide reasoning and rationale for decision making, identifying the best options from many potential decisions
3. Practice business writing and communication skills

AEEC 458. Economics of Making and Marketing Wine 3 Credits (3)

This course is designed to provide a basic knowledge of the principles of winemaking with emphases on wine production and economics for small wineries and home winemaking. The course also focuses on the investment costs of starting small wineries and the costs of making wine and successful market strategies for small wineries. The class includes a hands-on lab that includes selecting, crushing, fermenting grapes, and all the steps required through bottling the wine. Students must be 21 to enroll in the class. Consent of instructor required.

Learning Outcomes

1. Identify and evaluate production costs, economics, and marketing strategies for small wineries
2. Identify current technologies used in the production of wine for home and in a small winery
3. Identify the processes required to make high-quality wine using hands-on winemaking techniques, sensory analysis, and testing
4. Learn the basics of Viticulture (wine grape growing) practices

AEEC 470. Real Estate Appraisal 3 Credits (2+2P)

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Students must be Junior or above to enroll.

Learning Outcomes

1. Distinguish between the Income Approach, Cost Approach, and Sales Comparison Approach
2. Identify market abstracted influences on value
3. Apply proper appraisal methodology
4. Demonstrate appraisal knowledge by writing a residential appraisal and a farm appraisal

AEEC 499. Senior Thesis 3 Credits (3)

Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. Restricted to AEAB majors.

Prerequisites: consent of department head and have senior standing.

AEEC 501. Microeconomic Theory 3 Credits (3)

A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability.

Prerequisite(s): ECON 371 and ECON 457, or consent of instructor.

AEEC 502. Macroeconomic Theory**3 Credits (3)**

This course provides contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy. May be repeated up to 3 credits.

Learning Outcomes

1. Develop an in-depth understanding of the IS/LM model
2. Understand how fiscal and monetary policy affect output, employment, interest rates and prices
3. Develop and use mathematical models of the economy
4. Derive the effect of a change in tax rates, government spending, or a change in the money supply, on the nation's output through expenditure multipliers
5. Understand how fiscal and monetary policy work in an Open economy
6. Understand the basics of Exogenous and Endogenous Growth Theory

AEEC 503. Introduction to Quantitative Methods**3 Credits (3)**

Introduce students to quantitative tools widely used in applied economic analysis such as regression analysis, statistical tests, and mathematical programming. Restricted to: Agricultural Economics and Business (Masters) majors.

AEEC 506. Economic and Financial Analysis of Agribusiness**3 Credits (3)**

This course focuses on common analytical tools used to evaluate the economic and financial performance of businesses operating in the food and fiber supply chain. The course uses a combination of course discussions, assignments, and case studies to present the material critical to the successful management of agribusinesses. Topics include financial statements and analysis, financial planning/modeling, financial risk and risk management, the time value of money, and capital budgeting methods used in agribusiness.

Learning Outcomes

1. Read, understand, and create financial statements used in agribusiness, including income statements, balance sheets, cash flow statements, and owner's equity statements.
2. Describe and conduct financial analysis including comparative analysis, change analysis, and common-size analysis, and ratio analysis.
3. Describe and understand credit in agricultural production and agribusiness.
4. Understand the importance of capital budgeting within agribusiness and be able to conduct capital budgeting.
5. Describe, calculate, and use standard measures of investment return including net present value, internal rate of return, discounted payback period, and simple payback period.

AEEC 511. Advanced Derivative Markets**3 Credits (3)**

This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC/BFIN 311 and AEEC/BFIN 511. Crosslisted with: BFIN 511. May be repeated up to 3 credits.

Learning Outcomes

1. Define risk and identify methods of managing risk
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets
3. Identify the role that derivative markets play in reducing risk
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation

AEEC 520. International Agricultural Trade Theory and Policy**3 Credits (3)**

This course provides a review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives. May be repeated up to 3 credits.

Prerequisite: ECON 371.

Learning Outcomes

1. Understand and be able to describe the importance of international trade to U.S. agriculture.
2. Familiar with commonly used trade models to describe impacts of trade barriers, for example tariffs, quotas, and subsidies.
3. Analyze trade agreements and their impact on economies of different trade partners.

AEEC 522. Public Sector Economics I**3 Credits (3)**

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as POLS 522.

AEEC 540. Econometrics I**3 Credits (3)**

An integration of quantitative and statistical techniques for research and management in economics and business.

Prerequisite(s): ECON 457 and ECON 405 or A ST 505.

AEEC 545. Advanced Agricultural Policy**3 Credits (3)**

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AEEC 445V with additional work required at the graduate level. Cannot receive credit for both AEEC 445V and AEEC 545.

Prerequisite: consent of instructor.

AEEC 550. Advanced Microcomputer Applications in Agriculture
3 Credits (2+2P)

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Taught with AEEC 450 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 450 and AEEC 550.
Prerequisite(s): AEEC 2140G or consent of instructor.

AEEC 551. Advanced Agribusiness Marketing
3 Credits (3)

Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with emphasis on strategic marketing issues changing trade policies, and global competitiveness.

Prerequisite: consent of instructor.

AEEC 556. Advanced Agribusiness Management
3 Credits (3)

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach.

AEEC 575. Economics of Water Resource Management and Policy
3 Credits (3)

Focuses on issues, approaches and methods used in the assessment of water resource management and policy problems. Extends and further develops student understanding and comprehension of specific economic concepts and methods that are useful in the assessment and management of water resources, including cost-benefit analysis, welfare economics, non-market valuation, watershed management, and consideration of equity and ethical concerns. Students will develop critical reasoning, communication and analytic skills through active class discussions and assignments that emphasize both quantitative and written products.

AEEC 585. Production Economics
3 Credits (3)

Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. May be repeated up to 3 credits.

Prerequisite(s): MATH 1430G, ECON 312, and ECON 457.

AEEC 590. Special Topics
3 Credits (3)

Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.

Prerequisite: consent of instructor.

AEEC 593. Internship
1-6 Credits

Supervised professional on-the-job training experience in policy analysis.

AEEC 594. Internship
1-6 Credits

One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.

AEEC 595. Internship
3 Credits (3)

Supervised professional on-the-job learning experience.

Prerequisite(s): Consent of instructor.

AEEC 596. Individual Study
1-3 Credits

Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.

Prerequisite: consent of instructor.

AEEC 597. Non-Thesis Research Project
1-3 Credits (1-3)

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree.

AEEC 598. Creative Component Project
3-6 Credits (3-6)

Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree. Consent of instructor required. Restricted to AEEC majors.

Prerequisite(s): Consent of Instructor.

AEEC 599. Master's Thesis
1-15 Credits
Thesis.

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Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	

HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1430G	Applications of Calculus I ²	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10
ECON 2110G	Macroeconomic Principles (Economic Theory Coursework)	
ECON 2120G	Principles of Microeconomics (Economic Theory Coursework)	
Area III: Laboratory Sciences (4 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing a Wider World ³		6
Departmental/ College Requirements		
Quantitative		12
AEEC 2140	Technology and Communication for Business Management	
AEEC 342	Economic Analysis of Food and Agribusiness	
AEEC 350	Spreadsheet Applications in Food and Agriculture	
Choose one from the following:		
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
General Business		15
ACCT 2110	Principles of Accounting I	
ACCT 2120	Principles of Accounting II	
BLAW 316	Legal Environment of Business	
BFIN 341	Financial Analysis and Markets	
Select one from the following:		
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
MGMT 361	Small Business Management	
Economic Theory ⁴		6
AEEC 340	Economics of Food and Agricultural Markets	
or ECON 312	Intermediate Microeconomic Theory	
ECON 304	Money and Banking	
or ECON 311	Intermediate Macroeconomic Theory	
Applied Economics/Business		25
ACES 1120	Freshman Orientation	
ACES 1210	Financial Fitness for College Students	
AEEC 1110	Introduction to Agricultural Economics and Business	
AEEC 1120	Careers in Food and Agribusiness	
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC/MKTG 305	Marketing and Food Agricultural Products	
AEEC 385	Applied Production Economics	
AEEC 400	Senior Seminar	
AEEC 425	Food and Agribusiness Financial Management	
AEEC 445V	Agricultural Policy	
AEEC 456	Case Studies in Food and Agribusiness Management	
Required Specialty Area ⁵		6
Select and Complete two courses (6 hrs) from one Specialty Area:		
Natural Resources		
AEEC 314	Agricultural and Natural Resource Law	
AEEC/ECON 384V	Water Resource Economics	
AEEC/ECON 337V	Natural Resource Economics	

Finance	
AEEC 311	Financial Derivative Markets
AEEC/BFIN 470	Real Estate Appraisal
Marketing	
AEEC 313	Food and Agricultural Sales
AEEC/MKTG 451	Food and Agribusiness Market Assessment
Second Language: (not required)	
Electives, to bring the total credits to 120 ⁶	
Total Credits	
120	

¹ See the General Education (p. 220) section the catalog for a full list of courses. It is strongly encouraged that students satisfy the Area II Laboratory Science category by enrolling in AGRO 1110G Introduction to Plant Science (Lecture & Lab).

² MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enroll in MATH 142G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students who are interested in graduate degrees should consult with their academic advisor or faculty mentor early in their undergraduate program as some courses may have specific grade requirements and/or prerequisites. Our department participates in NMSU's Graduate School MAP Program where students can take graduate courses during the last part of their undergraduate degree.

⁵ Specialty Areas are Natural Resources, Finance, and Marketing. Students must complete two courses from the selected Specialty Area.

⁶ Elective credits may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with the academic advisor.

A Suggested Plan of Study for Students

A roadmap for students coming into Department of Agricultural Economics and Agricultural Business without deficiencies and without advanced coursework, e.g., AP course credit or dual credits wishing to pursue a degree in Agricultural Economics and Agricultural Business (AEAB).

This roadmap assumes student placement in MATH 1215 and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
AEEC 1120	Careers in Food and Agribusiness	1
AEEC 1110	Introduction to Agricultural Economics and Business	3
ENGL 1110G	Composition I	4
ECON 2110G	Macroeconomic Principles	3

AEEC 2140	Technology and Communication for Business Management	3
Credits		16
Spring		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
AEEC 2110	Principles of Food and Agribusiness Management	3
ECON 2120G	Principles of Microeconomics	3
Area III: Laboratory Science Course ¹		4
MATH 1215	Intermediate Algebra ²	3
Credits		16
Second Year		
Fall		
MATH 1220G	College Algebra ²	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
AEEC 305 or MKTG 305	Marketing and Food Agricultural Products or Marketing and Food Agricultural Products	3
VWW - Viewing a Wider World Course ³		3
Area V: Humanities ¹		3
Credits		15
Spring		
MATH 1430G	Applications of Calculus I	3
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
Choose one from the following:		3
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
MGMT 361	Small Business Management	
Area VI: Creative and Fine Arts ¹		3
Free Elective Course ⁴		3
Credits		15
Third Year		
Fall		
ACCT 2110	Principles of Accounting I	3
AEEC 342	Economic Analysis of Food and Agribusiness	3
AEEC 350	Spreadsheet Applications in Food and Agriculture	3
AEEC 445V	Agricultural Policy ((doesn't count towards VWW))	3
Any General Education Elective - "G" Course ¹		3
Credits		15
Spring		
ACCT 2120	Principles of Accounting II	3

AEEC 340 or ECON 312	Economics of Food and Agricultural Markets or Intermediate Microeconomic Theory	3
BFIN 341	Financial Analysis and Markets	3
Required Specialty Area Course ⁵		3
Free Elective Course ^{4,6}		3
Credits		15
Fourth Year		
Fall		
ECON 304 or ECON 311	Money and Banking or Intermediate Macroeconomic Theory	3
AEEC 385	Applied Production Economics	3
AEEC 425	Food and Agribusiness Financial Management	3
Required Specialty Area Course ⁵		3
Free Elective Course ^{4,6}		3
Credits		15
Spring		
AEEC 400	Senior Seminar	1
AEEC 456	Case Studies in Food and Agribusiness Management	3
VWW - Viewing a Wider World Course ³		3
BLAW 316	Legal Environment of Business	3
Free Elective Course ^{4,6}		3
Credits		13
Total Credits		120

¹ See the General Education (p. 220) section the catalog for a full list of courses. It is strongly encouraged that students satisfy the Area II Laboratory Science category by enrolling in AGRO 1110G Introduction to Plant Science (Lecture & Lab).

² MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enroll in MATH 1430G Applications of Calculus I first.

**MATH 1215 and MATH 1220G are prerequisites, but if they are not needed use Free Elective Courses to replace the courses in the Roadmap*

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credits may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with the academic advisor.

⁵ Specialty Area courses can be found on the Requirements (p. 297) tab of this degree. The areas are Natural Resources, Finance and Marketing. Students must complete two courses from the selected Specialty Area

⁶ Students who are interested in graduate degrees should consult with their academic advisor or faculty mentor early in their undergraduate program as some courses may have specific grade requirements and/or prerequisites. Our department participates in NMSU's Graduate School MAP Program where students can take graduate courses during the last part of their undergraduate degree.

**The 4th Year Semester (Spring) shows 13 hours. Student's financial aid requirement may require them to enroll in 15 hours.*

Natural Resource Economics and Policy - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level I</i> ¹		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i> ¹		
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i> ¹		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1430G	Applications of Calculus I ²	3
<i>Area III/IV: Laboratory Science and Social/Behavioral Sciences</i>		
FWCE 1110G	Introduction to Natural Resources Management	4
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
<i>Area V: Humanities</i> ¹		
<i>Area VI: Creative and Fine Arts</i> ¹		
<i>General Education Elective</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Applied Economics Core</i>		
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
AEEC/ECON 337V	Natural Resource Economics	3
AEEC/ECON 384V	Water Resource Economics	3
AEEC 385	Applied Production Economics	3
AEEC 400	Senior Seminar	1
AEEC 350	Spreadsheet Applications in Food and Agriculture	3

ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
<i>Science, Policy and Ethics</i>		
AEEC 445V	Agricultural Policy	3
Select one from the following:		3
AEEC 314	Agricultural and Natural Resource Law	
BLAW 316	Legal Environment of Business	
FWCE 447	Wildlife Law and Policy	
ECON 300+ Cocurse		3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
GEOG 2130	Map Use and Analysis	3
or FWCE 471	GIS for Natural Resource Scientists	
POLS 330	Introduction to Public Administration	3
RGSC 2110	Introduction to Rangeland Management	3
PHIL 300+ Course		3
<i>Quantitative Skills</i>		
A ST 311	Statistical Applications	3
or MATH 1350G	Introduction to Statistics	
MATH 1215	Intermediate Algebra	3
MATH 1220G	College Algebra	3
AEEC 2140	Technology and Communication for Business Management	3
Second Language: (not required)		
Electives, to bring the total creditsto 120 ⁴		21
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1430G Applications of Calculus I is required for the degree but students may first need to take any prerequisites needed before taking MATH 1430G. Students who place or transfer in a higher-level course are exempt from MATH 1430G.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credit and may appear in variable form base on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

A roadmap for students coming into the Department of Agricultural Economics and Agricultural Business without deficiencies and without advanced coursework, e.g., AP course credit or dual credits wishing to pursue the degree in Natural Economics and Policy (NREP).

This roadmap assumes student placement in MATH 1215 and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
ENGL 1110G	Composition I	4
Area V: Humanities ¹		3
AEEC 2140	Technology and Communication for Business Management	3
MATH 1215	Intermediate Algebra	3
Credits		15

Spring

Choose one from the following		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ECON 2110G	Macroeconomic Principles	3
MATH 1220G	College Algebra	3
RGSC 2110	Introduction to Rangeland Management	3
Elective Course ²		3
Credits		15

Second Year

Fall		
Choose one from the following ¹		3
COMM 1130G	Public Speaking	
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
MATH 1430G	Applications of Calculus I	3
ECON 2120G	Principles of Microeconomics	3
FWCE 1110G	Introduction to Natural Resources Management	4
Elective Course ²		3
Credits		16

Spring

AEEC 350	Spreadsheet Applications in Food and Agriculture	3
Choose one from the following:		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
ECON 312	Intermediate Microeconomic Theory	3
FWCE 2110	Principles of Fish and Wildlife Management	3
Elective Course ²		3
Credits		15

Third Year

Fall		
Area VI: Creative or Fine Arts Course ¹		3
AEEC 337V or ECON 337V	Natural Resource Economics or Natural Resource Economics	3
ECON 311	Intermediate Macroeconomic Theory	3
AEEC 385	Applied Production Economics	3
GEOG 2130 or FWCE 471	Map Use and Analysis or GIS for Natural Resource Scientists	3
Credits		15

Spring

VWW - Viewing a Wider World Course ³		3
AEEC 384V or ECON 384V	Water Resource Economics or Water Resource Economics	3
ECON Course (300-level or above)		3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Elective Course ²		3
Credits		16

Fourth Year

Fall		
Viewing a Wider World (VWW) ³		3
AEEC 445V	Agricultural Policy	3
POLS 330	Introduction to Public Administration	3
Elective Course ²		3
Elective Course ²		3
Credits		15

Spring

AEEC 314 or BLAW 316 or FWCE 447	Agricultural and Natural Resource Law or Legal Environment of Business or Wildlife Law and Policy	3
AEEC 400	Senior Seminar	1
FWCE 301	Wildlife Ecology	3
PHIL Courses (300-level or above)		3
Elective Course ^{2,4}		3
Credits		13
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ The 4th year semester (Spring) shows 13 hours. Student's financial aid requirement may require them enroll in 15 hours.

Agricultural Business Management-Undergraduate Minor

The minor in Agricultural Business Management (ABM) consists of 18 or more credit hours of approved course work from the list below. All courses must be completed with grades of "C" or better. Once courses are completed or show "IP" status, students pursuing the ABM minor need to log in to their myNMSU and print out the STAR Audit for the minor and obtain departmental approval. The course requirements for the ABM minor are as follows:

Prefix	Title	Credits
Required Core		
AEEC 2110	Principles of Food and Agribusiness Management	3

AEEC 2120	Introduction to Food and Agribusiness Accounting	3
AEEC 305	Marketing and Food Agricultural Products	3
Agricultural Policy		
<i>Choose one from the following</i>		3
AEEC 315V	World Agriculture and Food Problems	
AEEC 337V	Natural Resource Economics	
AEEC 384V	Water Resource Economics (Agribusiness Electives)	
AEEC 445V	Agricultural Policy (Technical Courses (6))	
Ag Business and Ag Economics		
<i>Choose two from the following</i>		6
AEEC 311	Financial Derivative Markets	
AEEC 313	Food and Agricultural Sales	
AEEC 314	Agricultural and Natural Resource Law	
AEEC 340	Economics of Food and Agricultural Markets	
AEEC 350	Spreadsheet Applications in Food and Agriculture	
AEEC 385	Applied Production Economics	
AEEC 425	Food and Agribusiness Financial Management	
AEEC 451	Food and Agribusiness Market Assessment	
AEEC 456	Case Studies in Food and Agribusiness Management	
AEEC 458	Economics of Making and Marketing Wine	
AEEC 470	Real Estate Appraisal	
Total Credits		18

Natural Resource Economics - Undergraduate Minor

The minor in Natural Resource Economics (NRE) consists of 18 or more credit hours of approved course work of which at least 9 hours must be numbered 300 or above and completed with grades of "C" or better. Once courses are completed or show "IP" status in the audit, students pursuing the NRE minor need to log in to their mynmsu and print out the STAR Audit and obtain departmental approval. The course requirements for the NRE minor are as follows:

Prefix	Title	Credits
Required Courses		
ECON 2120G	Principles of Microeconomics	3
<i>Select one course from the following:</i>		3
AEEC/ECON 337V	Natural Resource Economics	
AEEC/ECON 384V	Water Resource Economics	
<i>Select two courses from the following</i>		6
FWCE 2110	Principles of Fish and Wildlife Management	
AEEC 445V	Agricultural Policy	
POLS 330	Introduction to Public Administration	
<i>Select two courses from the following</i>		6
FWCE 1110G	Introduction to Natural Resources Management	
FWCE 301	Wildlife Ecology	
GEOG 2130	Map Use and Analysis	
RGSC 2110	Introduction to Rangeland Management	
PHIL 300+		
Total Credits		18

Animal and Range Sciences Undergraduate Program Information

The Department of Animal and Range Sciences provides opportunities for you to follow a variety of interests in modern scientific agriculture. The animal science curriculum provides a background for many phases of the food animal industry, from farm animal production on rangelands to management positions in the food processing industry to highly technical careers in research and companion animal management. The range science curriculum provides you with knowledge and skills necessary to sustainably manage rangelands for multiple uses. These curricula allow you to acquire the background necessary to adjust easily to variations in specific job opportunities. If you are majoring in either animal science or range science, you must meet general education requirements, have a minimum of 48 credits of upper-division courses (numbered 300 and above), and complete a minimum of 35 credits in courses in the College Agricultural, Consumer and Environmental Sciences.

Graduate Program Information

The Department of Animal and Range Sciences offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees with majors in animal science and range science. The Doctor of Philosophy degree in animal science is only in the areas of reproductive physiology or ruminant nutrition.

Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum, substantially equivalent to that required of undergraduate students in animal or range science at this institution, 3.0 GPA, and three letters of reference.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects will be required, together with a thesis for most majors. A non-thesis option is available for certain students.

For the Master of Agriculture with specialization in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 Special Research Programs for the creative component.

The Doctor of Philosophy student must demonstrate proficiency in a foreign language or research tool, such as experimental statistics, philosophy of science, computer science, or mathematics. Choice of the research tool will remain the option of the student subject to approval by the student's graduate committee. Demonstration of proficiency may be accomplished by satisfactory completion of courses or by other suitable evidence acceptable to the student's committee. In addition, doctoral students are required to complete advanced courses in a field of study closely related to animal science or range science. The number of courses to be completed in the related area will be determined by the student's committee. Related areas of study often are biology, chemistry, or experimental statistics.

The Department of Animal and Range Sciences is a sponsoring department in the recently approved interdisciplinary graduate degree program that offers both a MS and Ph.D. degree in Water Science Management. The degree program is being handled through the College of Agricultural, Consumer and Environmental Sciences (ACES), and the program description, including application guidelines, classes involved, and topic areas being supported can be found in the catalog under the section describing ACES Programs. Interested students are encouraged

to contact the Department Head of Animal and Range Sciences, Shanna Ivey at (575) 646-2515 for more information.

Graduate work in the department is designed to prepare the student for work in the fields of research, extension, teaching, production, and conservation.

Facilities available to graduate students include herds and flocks of the major livestock species, animal nutrition laboratories, physiology laboratories, meats laboratory, small animal laboratory, 25,000-specimen herbarium, two ranches of approximately 92,000 acres, and a 1,000-head experimental feedlot. Active cooperation is maintained with federal research agencies located on and off the campus.

A number of graduate assistantships will be available each year. Inquiries should be addressed to the head of the department.

Degrees for the Department

Bachelor Degree(s)

- Animal Science (Animal Industry) - Bachelor of Science in Agriculture (p. 312)
- Animal Science (Science) - Bachelor of Science in Agriculture (p. 314)
- Range Science - Bachelor of Science in Agriculture (p. 316)

Master Degree(s)

- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 92)
- Animal Science - Master of Science (p. 96)
- Range Science - Master of Science (p. 163)

Doctoral Degree(s)

- Animal Science - Doctor of Philosophy (p. 174)
- Range Science - Doctor of Philosophy (p. 198)

Minors for the Department

- Animal Science - Graduate Minor (p. 212)
- Dairy Science - Undergraduate Minor (p. 318)
- Horse Management - Undergraduate Minor (p. 319)
- Human Animal Interaction - Undergraduate Minor (p. 319)
- Livestock Production - Undergraduate Minor (p. 319)
- Ranch Management - Undergraduate Minor (p. 319)
- Range Science - Graduate Minor (p. 218)
- Range Science - Undergraduate Minor (p. 319)

Department Head Shanna L. Ivey

Professors Ashley, Bailey, Duff, Fasenko, Fernald, Ivey, Löest, Soto

Associate Professors Hernandez Gifford, Scholljegerdes, Summers

Assistant Professors Geli,

College Track Associate Professors Campbell

College Track Assistant Professor Fuentes, Smythe

Instructors Bilovesky; Priest

Co-operators (USDA) Estell, Herrick, Peters

Emeritus Faculty Allred, Cibils, Holechek, McDaniel, Ross, Thomas

S. L. Ivey, Department Head, Ph.D. (New Mexico State University)- ruminant nutrition/microbiology; K. W. Allred, Ph.D. (emeritus, Texas A&M University)- plant taxonomy; R.L. Ashley, Ph.D. (Colorado State University)- physiology of reproduction; D.W. Bailey, Ph.D. (Colorado State University)- rangeland management; J.W. Campbell, Ph.D. (New Mexico State University)- reproductive physiology; A.F. Cibils, Ph.D. (Colorado State University)- grazing management and ecology; G.C. Duff, Ph.D. (New Mexico State University)- animal nutrition; G.M. Fasenko, Ph.D. (North Carolina State University)- companion animal management; A. G. Fernald, Ph.D. (Colorado State University)- land use hydrology and water quality hydrology; S. Fuentes-Soriano, Ph.D. (University of Missouri-Saint Louis)-biology in plant systematics and evolution; H. M. E. Geli, Ph.D. (Utah State University)- landscape hydrology; J. Hernandez-Gifford, Ph.D. (Washington State University)-reproductive physiology; J. L. Holechek, Ph.D. (Oregon State)- range ecology; C. A. Löest, Ph.D. (Kansas State University)- ruminant nutrition; K. C. McDaniel, Ph.D. (emeritus, Texas A&M University)- brush management; L. Prihodko, Ph.D. (Colorado State University)-range ecology; T. T. Ross, Ph.D. (emeritus, North Carolina State University)- physiology of reproduction and sheep production; E.J. Scholljegerdes, Ph.D. (University of Wyoming)- ruminant nutrition; B.G. Smythe, Ph.D. (New Mexico State University)- veterinary entomology; S.A. Soto-Navarro, Ph.D. (New Mexico State University)- ruminant nutrition; A.F. Summers, Ph.D. (University of Nebraska)-physiology of reproduction; J. D. Thomas, Ph.D. (emeritus, University of Missouri-Columbia)- meat science.

Adjunct faculty: C. D. Allison, Ph.D. (Texas A&M University)- range management; A. Faist, Ph. D. (University Colorado Boulder) - range ecology; K. M. Harvstad, Ph.D. (Utah State University)- range animal nutrition; J.E. Herrick, Ph.D. (Ohio State University)- soils; M.R. Levi, Ph. D. (University of Arizona)-soil morphology/classification; T.J. Nagaraja, Ph.D. (Kansas State University)-rumen microbiology; D.P. Peters, Ph.D. (Colorado State University)- landscape ecology; S. Spiegel, Ph.D. (University of California Berkeley)-range management.

Cooperative Extension Service: D. Cram, Ph.D. (New Mexico State University)- range science; R. Hagevoort, Ph. D. (Texas A&M University) - dairy science; C. Gifford, Ph. D. (University of Idaho)-animal science; R. Sallenave, Ph.D. (University of Guelph)-aquatic ecology; S. Smallidge, Ph.D. (New Mexico State University) - wildlife; C. Spackman, Ph.D. (Utah State University)- range science; J. L. Turner, Ph.D. (Kansas State University)- equine immunology and physiology; M. Ward, Ph.D. (North Dakota State University)- ruminant nutrition;

Animal Science Courses

ANSC 1110. Animal Science Careers

1 Credit (1)

Introduction to scientific disciplines and career options in animal-agriculture career skill development, including resume preparation, networking, importance of internships, and leadership experiences in animal agriculture.

Learning Outcomes

1. Increasing the understanding of career opportunities in animal agriculture.
2. Gain a broad experience in the development of creative thinking about the career choices available in animal agriculture.
3. Apply the increased knowledge of career development in the career path and internship directions for each student.
4. Gain leadership experience that will be impactful for the student in their pursuit of a career in animal agriculture.

ANSC 1120. Introduction to Animal Science**3 Credits (3)**

This course is designed to provide an introduction to nutrients and their function in livestock animals. Basic feed identification, evaluation, and diet formulation will be discussed. The anatomy of the digestive tract of animals and their ability to utilize feedstuffs is presented. Classification, digestion, absorption, transport and metabolism of major nutrients required by animals are studied

Learning Outcomes

1. Identify conventional and non-conventional feedstuffs that are fed to livestock animals.
2. Describe various methods for feed processing and storage.
3. Assess the nutritional value of a ration or feed ingredients.
4. Interpret the NRC (Nutrient Requirement Council) guidelines for feeding livestock.
5. List the basic digestive anatomy for all classes of livestock.
6. Describe nutritional deficiencies and digestive disorders common to livestock animals

ANSC 1120H. Introduction to Animal Science Honors**3 Credits (3)**

This course is designed to provide an introduction to nutrients and their function in livestock animals. Basic feed identification, evaluation, and diet formulation will be discussed. The anatomy of the digestive tract of animals and their ability to utilize feedstuffs is presented. Classification, digestion, absorption, transport and metabolism of major nutrients required by animals are studied. Additional course work will be required. Restricted to Las Cruces campus only.

Prerequisite(s): Eligibility for membership in honors college.

Learning Outcomes

1. Identify conventional and non-conventional feedstuffs that are fed to livestock animals.
2. Describe various methods for feed processing and storage.
3. Assess the nutritional value of a ration or feed ingredients.
4. Interpret the NRC (Nutrient Requirement Council) guidelines for feeding livestock.
5. List the basic digestive anatomy for all classes of livestock.
6. Describe nutritional deficiencies and digestive disorders common to livestock animals

ANSC 1120L. Introduction to Animal Science Lab**1 Credit (2P)**

Students will observe and participate in activities related to farm animal management and will include areas of livestock selection, nutrition, reproductive physiology, animal ID and animal health. This lab is required for animal science majors.

Prerequisite(s)/Corequisite(s): ANSC 1120.

Learning Outcomes

1. To provide the students with an understanding of the principles, concepts and terminology of today's livestock industry

ANSC 1130. Western Equitation I**2 Credits (4P)**

Basic principles of Western riding, including care and management of the riding horse, equitation equipment, and development of riding skills.

ANSC 1140. Introduction to Dairy Science**3 Credits (3)**

Introduction to the basic aspects of dairy science and how to apply key concepts to the practical feeding and management of dairy cattle and production of dairy products. Students should also obtain an appreciation for the size and diversity of the dairy industry.

Prerequisite(s)/Corequisite(s): ANSC 1120. Restricted to Las Cruces campus only.

Learning Outcomes

1. Learn key concepts in dairy production and management
2. Be familiar with terms used in production of milk and milk products

ANSC 1160. Introductory Horse Science**3 Credits (2+2P)**

The light horse industry; breeds; introduction to feeding, breeding, marketing and management; handling and selecting horses for breeding and performance.

Learning Outcomes

1. Describe and identify breeds of horses, their characteristics and their uses.
2. Demonstrate knowledge of basic physiology of horses by recalling parts of the horse, including bones, muscle, tendons and ligaments. Also, by ageing horses via teeth, body condition scoring and taking vital signs.
3. Demonstrate safe and proper handling of horses.
4. Demonstrate comprehension of basic nutrition and feedstuffs by formulating/correcting diets in clinical and non-clinical situations.
5. Recall aspects of basic reproduction by calculating a stallion book and recalling appropriate procedures for breeding.
6. Create informative articles that seek to educate the lay horse person about a topic covered in class.

ANSC 1170. Introduction to Animal Metabolism**3 Credits (3)**

Principles underlying the mechanisms of animal metabolism as they relate to production, maintenance, and health of animals.

Prerequisite: CHEM 1215G.

Learning Outcomes

1. This course provides an introduction to the study of the physiology of life.
2. The first part of the course covers acids and bases and the chemical nature of organic compounds.
3. The second part of the course relates to the chemistry of biomolecules (nutrients) and summarizes the chemical reactions of life (metabolism).

ANSC 1180. Companion Animal in Society**3 Credits (3)**

Examination of the historical, current, and potential future roles of companion animals in human society. Topics include animal domestication, breeds, exotic companion animals, the companion animal industry, and competitions and sports involving companion animals. Emphasis is on canine and feline species. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Discuss the theories regarding why, how, and when companion animals became domesticated.
2. Describe how selective breeding has optimized certain physiological and behavioral traits of companion animals in order to fulfill the needs of individual people and society.
3. Explain the concept of human-companion animal interaction (HAI) and the influence this bond has on human behavior, health, society, and government policy/laws.
4. Understand the breadth and economic impact of the rapidly expanding companion animal industry and the recent expenditure trends of pet owners.
5. Discuss the past and present uses of companion animals and theorize regarding the future uses of companion animals in society.
6. Be effective in searching for, and critically evaluating, scientific based resources.

ANSC 2120. Equine Management**3 Credits (3)**

Introduction and application of the business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

Prerequisite: ANSC 1160.

Learning Outcomes

1. Develop a working knowledge of the business principles needed to operate a successful entrepreneurial enterprise.
2. Increase the awareness of the need for business principles in the aggregate function of an equine operation.
3. Gain a greater perspective of accounting, economic and financial principles in an equine business operation.

ANSC 2130. Western Equitation II**2 Credits (4P)**

Intermediate principles of Western riding, including reading horse behavior, limbering-up exercises, and developing riding skills. Introduction to rollbacks, turnarounds and stops.

Prerequisite: consent of instructor.

Learning Outcomes

1. Increasing the understanding of the student relative to equitation practices
2. Increase the students' ability to apply principles of Western Equitation to applied settings across a broad spectrum of outlets
3. Prepare the student to engage equine in a professional manner

ANSC 2140. Introduction to Companion Animal Science**3 Credits (3)**

Introduction to the care of common companion animal species. Species specific housing and nutrition are covered in the context of maximizing animal health and well-being and reducing disease. May be repeated up to 3 credits.

Learning Outcomes

1. Accurately use scientific terminology common to the companion animal discipline.
2. Compare and contrast the physiological similarities and differences between the various companion animal species studied in class.
3. Create dietary plans based on the nutritional needs of different companion animal species to optimize animal health and lifespan.
4. Identify symptoms of disease/injury at the early stages of illness in order to obtain Veterinary care and treatment as quickly as possible.
5. Design and construct species specific cages/vivariums to maximize animal well-being and health.
6. Educate others regarding providing the best possible care for a variety of companion animal species.

ANSC 2150. Management of Equine Operations**3 Credits (3)**

Introduction and application of business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

Prerequisite(s): ANSC 1160.

Learning Outcomes

1. Acquire a working knowledge of different sectors of the equine industry, including business practices, management and marketing skills.

ANSC 2310. Introduction to Meat Science**3 Credits (2+3P)**

Fundamental aspects of the red meat industry. Lecture topics and laboratory exercises include the nutrient value of meat, meat preservation, meat safety, muscle structure and contraction, slaughter and processing of beef, lamb and pork, sausage manufacture, meat curing, meat cookery, and muscle and bone anatomy.

Learning Outcomes

1. Increasing the understanding of meat science applications across animal agriculture.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat science in a global situation.
4. Gain an understanding of the components involved in the development and processing of the red meat industry.

ANSC 2330. Animal Production**3 Credits (2+2P)**

Production and utilization of beef cattle, sheep, and swine; emphasis on feeding, breeding, management problems and marketing; selection of animals for breeding and market

Learning Outcomes

1. Increasing the understanding of meat animal production.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat animal production to global situations.
4. Gain a broader understanding of the importance of meat animals in the global food system.

ANSC 2340. Genetics in Animal Science**3 Credits (3)**

Introduction to genetics and inheritance relative to livestock production. Introduction to procedures for collection and use of performance information in livestock improvement programs.

Prerequisites: BIOL 2610G.

Learning Outcomes

1. Gain a broader understanding of the role genetic impacts in the livestock industry.
2. Employ an increased knowledge of impact of genetics in the food animal industry and the production and economic principles that apply.
3. Recognition of the global impacts of genetics in the food animal industry in a global setting.

ANSC 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

Learning Outcomes

1. Varies

ANSC 301. Animal and Carcass Evaluation**3 Credits (2+2P)**

Determination of the market value of meat animals by relating live animal and carcass traits. Topics include the identification of economically important traits, grading, growth and development, wholesale and retail pricing, and futures and options markets.

ANSC 303. Livestock, Meat and Wool Evaluation**4 Credits (3+2P)**

Selection, classification, grading, and judging of livestock, meat, and wool.

ANSC 304. Feeds and Feeding**3 Credits (2+2P)**

Digestibility of feeds, their nutritive values, grades, and classes, principles of ration formulation and computer ration formulations, and practical feeding of farm animals. **Prerequisite(s):** CHEM 1215G

ANSC 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

ANSC 308. Horse Evaluation**4 Credits (2+4P)**

Students will acquire a working knowledge of selection and classification of horses, learn criteria for evaluation and selection of breeding and show animals, gain a broad understanding of judging conformation and performance in the horse, and learn effective oral and written communication skills through defense of class placings. This course is considered an introduction to the NMSU Horse Judging Team.

ANSC 310. Exhibiting Livestock**3 Credits (1+4P)**

Fitting and showing beef cattle, dairy cattle, sheep and swine.

ANSC 312V. Companion Animals and the Human- Animal Interaction**3 Credits (3)**

The science behind human-animal interactions (HAI). An examination of the interactions between humans and companion animals and the effects on human and animal health and wellness. Cultural differences in HAI will be explored. Topics will include Animal Assisted Activity (AAA), Animal Assisted Therapy (AAT), and service animals. Emerging and future uses of companion animals in HAI will be discussed.

ANSC 320. Equine Behavior and Training**3 Credits (6P)**

Basic principles, methods and philosophies of handling, breaking and training the two-year-old Western horse. May be repeated up to 6 credits.

Prerequisite(s): ANSC 2130 or consent of instructor.

ANSC 321. Advanced Equine Behavior and Training**3 Credits (6P)**

Continuation of ANSC 320. Further development of skills required to advance the training of the two-year-old Western horse. Emphasis will be placed on lateral work, lead changes, turn-arounds, obstacles, and making the horse accustomed to ranch and trail riding situations.

Prerequisite(s): ANSC 320 or consent of instructor.

ANSC 350. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

ANSC 351V. Agricultural Animals of the World**3 Credits (3)**

Global study of the development and use of animals for production of food and nonfood products. Climatic, cultural, and economic influences on systems of livestock production and species and breeds of livestock utilized will be evaluated.

ANSC 370. Anatomy and Physiology of Farm Animals**4 Credits (3+2P)**

Structure and function of the animal body. Includes studies of the horse, cow, sheep, pig, and comparisons with the human body.

Prerequisite(s): CHEM 1215G and BIOL 2610G or BIOL 2110G.

ANSC 383. Equine Reproductive Management**3 Credits (1+4P)**

Anatomy, physiology, and endocrinology of reproduction of the mare and stallion; training in modern reproductive techniques employed in the horse industry.

Prerequisites: ANSC 1160, ANSC 2150, and ANSC 370.

ANSC 390. Internship**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

Prerequisite: consent of instructor.

ANSC 391. Undergraduate Research Experience**1-3 Credits (1-3)**

Formal laboratory, library, or field study of problems related to animal sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 392. Animal Sciences Teaching/Extension Experience**1-3 Credits (1-3)**

: Formal teaching experience related to animal sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students may also be involved in development, implementation, or assessment of adult or youth educational programs related to animal sciences, supervised by a faculty member. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 402. Animal Science Seminar**1 Credit (1)**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

ANSC 402 H. Animal Science Seminar**1 Credit (1)**

Taught with ANSC 402 with additional work.

Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status.

ANSC 411. Canine and Feline Behavior and Training**3 Credits (3)**

The influence of domestication, breeds, genetics, and physiology on the behavior of canine and feline species. Training methods and modification of problem behaviors are examined. The impact of the pet parent on their animal's behavior is addressed. May be repeated up to 3 credits.

Prerequisite(s): Junior or Senior status or consent of the instructor.

ANSC 412. Canine and Feline Health and Diseases**3 Credits (3)**

A review of common infectious and non-infectious diseases and the basics of the immune response. Pathophysiology and treatment of these diseases and the role the pet parent plays in pre-disposing their animals to disease. May be repeated up to 3 credits.

Prerequisite(s): ANSC 2140 or consent of instructor.

ANSC 421. Physiology of Reproduction**4 Credits (3+2P)**

Fertility and the role of hormones, nutrition, selection, management and environment in the maintenance of high reproductive rate.

Prerequisite(s): ANSC 370.

ANSC 422. Animal Nutrition**3 Credits (3)**

Nutrient utilization and measurement and nutrient requirements for the various body functions.

Prerequisite(s): CHEM 2115 or CHEM 313 or ANSC 1170.

ANSC 423. Animal Breeding**3 Credits (2+2P)**

Mating systems, and selection procedures; calculation of inbreeding coefficients, genetic relationships, and gene frequency.

Prerequisite(s): ANSC 2340 or 305.

ANSC 424. Swine Production**3 Credits (2+2P)**

Breeding, feeding, and care of swine.

Prerequisite(s): ANSC 304.

ANSC 425. Horse Science and Management**3 Credits (2+2P)**

Senior level course requiring students to apply basic knowledge acquired in the previous courses to solve typical problems encountered in the horse industry. Specific topics include genetics and animal breeding, business and legal issues, reproduction, health, nutrition and exercise physiology.

Prerequisite(s): ANSC 304 and ANSC 370 or concurrent registration.

ANSC 426. Beef Production: Cow-Calf Management**3 Credits (2+2P)**

Senior level course examining management practices for the cow-calf producers. Specifically focusing on nutrition, reproduction, genetics, marketing, and health. May be repeated up to 3 credits.

Prerequisite(s): ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.

ANSC 427. Dairy Production**3 Credits (2+2P)**

Breeding, nutrition, physiology and management of dairy cattle.

Prerequisite(s): ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.

ANSC 428. Sheep and Wool Production**3 Credits (2+2P)**

Genetics, nutrition, physiology and management of sheep. Wool grading, shearing, and disease control.

Prerequisite(s): ANSC 304 and junior status.

ANSC 429. Beef Production: Feedlot Management**3 Credits (2P)**

Senior level course in feedlot management of beef cattle. Topics of interest include cattle handling and processing, health and nutrition, intake management, and growth. Feed mill operation, marketing strategies, and regulatory concerns associated with finishing cattle production may also be discussed.

Prerequisite(s): ANSC 304 or Consent of Instructor.

ANSC 448. Problems**1-4 Credits**

Individual investigation in a specific area of animal science. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 458. Livestock Behavior, Welfare and Handling**3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: RGSC 458

Prerequisite(s): RGSC 2110 or ANSC 1120.**ANSC 462. Parasitology****3 Credits (3)**

Same as EPWS 462.

ANSC 468. Advanced Dairy Herd Management**3 Credits (3)**

The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as topics vary. Consent of instructor required.

Prerequisite(s): ANSC 304.**ANSC 480. Environmental Physiology of Domestic Animals****3 Credits (3)**

Influence of environmental factors on physiological processes of domestic animals.

Prerequisite: ANSC 370.**ANSC 484. Ruminant Nutrition****3 Credits (3)**

Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds.

Prerequisite: ANSC 422.**ANSC 488. Equine Nutrition and Exercise Physiology****3 Credits (2+2P)**

Students will gain an in-depth understanding of nutrition and exercise physiology in the horse. Students will investigate the response of major physiological systems to exercise, conditioning and training, gastrointestinal physiology, nutrition requirements and clinical nutrition of the horse. Students must have Junior standing or higher to enroll in this course.

ANSC 501. Advanced Animal Nutrition (so)**3 Credits (3)**

Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied.

Prerequisite(s): CHEM 2115 or consent of instructor.**ANSC 504. Animal Physiology Techniques (se)****4 Credits (4)**

Radioimmunoassay procedures. Methods and procedures for conducting reproductive physiology research in livestock. Includes animal preparation, sample collection, laboratory and cell culture procedures.

Prerequisite: consent of instructor.**ANSC 507. Laboratory Techniques in Nutrition (f)****4 Credits (2+6P)**

Methodology and experimental procedures in measuring nutrient requirements and value of diets.

Prerequisites: ANSC 422 or consent of instructor.**ANSC 509. Endocrinology of Domestic Animals (f)****3 Credits (3)**

The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.

ANSC 510. Range Nutrition Techniques (se)**3 Credits (3)**

Animal and plant methods of determining quantity and quality of range forage. Same as RGSC 510.

Prerequisite: ANSC 484 or consent of instructor.**ANSC 512. Research Methods in Animal Science (s)****4 Credits (3+2P)**

Procedures used in animal science research, including planning and conduct of investigations and interpretation of results.

ANSC 515. Graduate Seminar**1 Credit (1)**

Current topics.

ANSC 520. Advanced Nutritional Management I: Feedlot (se)**3 Credits (3)**

Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management.

Prerequisite: ANSC 484 or consent of instructor.**ANSC 521. Advanced Nutritional Management II: Cow Calf/Stocker (so)****3 Credits (3)**

Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management.

Prerequisite: ANSC 484 or consent of instructor.**ANSC 522. Animal Nutrition (f)****3 Credits (3)**

Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 with additional requirements for graduate students. Recommended for nonmajors.

Prerequisite(s): CHEM 2115.**ANSC 560. Rumen Microbiology (so)****3 Credits (3)**

Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Same as FSTE 560.

Prerequisites: ANSC 501.**ANSC 580. Environmental Physiology of Domestic Animals****3 Credits (3)**

Influence of environmental factors on physiological processes of domestic animals. Specific focus on fetal and developmental programming, heat and cold stress.

ANSC 598. Special Research Programs**1-4 Credits (1-4)**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.

Learning Outcomes

1. Various

ANSC 600. Research**1-15 Credits**

This course is for Ph.D. students before they have completed qualifiers. Consent of Instructor required. Thesis/Dissertation Grading.

Prerequisite(s): ANSC 421 or consent of instructor.

ANSC 602. Advanced Reproductive Physiology (fo)**3 Credits (3)**

Mechanisms of reproductive function; research methodology.

Prerequisite(s): ANSC 421 or consent of instructor.**ANSC 602 L. Molecular Techniques in Reproductive Physiology (fo)****2 Credits (4P)**

Molecular biology techniques used in the study of reproductive physiology in domestic animals. Extraction of RNA, DNA from endocrine tissues, northern analysis, culture of pituitary/ovarian tissue. Mechanisms of hormone action.

Prerequisite: consent of instructor.**ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)****1 Credit (1)**

Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis.

Prerequisite: ANSC 509.**ANSC 605. Gonadal and Uterine Endocrinology (fe)****1 Credit (1)**

Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts.

Prerequisite: ANSC 509.**ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe)****1 Credit (1)**

Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals.

Prerequisite: ANSC 509.**ANSC 621. Metabolic Functions and Dysfunctions (fe)****3 Credits (3)**

Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology.

Prerequisites: CHEM 345 and ANSC 501.**ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo)****4 Credits (4)**

Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants.

Prerequisite: ANSC 501.**ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)****4 Credits (4)**

Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use.

Prerequisite: ANSC 501.**ANSC 698. Special Research Programs****1-4 Credits**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 700. Doctoral Dissertation**15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

Range Science Courses

RGSC 1110. The Range Science Profession**1 Credit (1)**

Introduction to scientific disciplines and career opportunities in rangeland science and management.

Learning Outcomes

1. To introduce students to the Range Science program and to a variety of career opportunities in Range Science.
2. To develop an individualized course curriculum that prepares the student to achieve their career goals.
3. To examine opportunities to gain practical work experience through internships and cooperative employment.

RGSC 2110. Introduction to Rangeland Management**3 Credits (3)**

This course covers the principles of managing and understanding pasture and rangelands. Plant physiology and ecology, plant communities and rangeland sustainability and how they relate to livestock production and wildlife management will be discussed. Restricted to: Main campus only.

Learning Outcomes

1. Understand rangeland management operations.
2. Identify rangeland plants.
3. Gain a perspective of watershed management.
4. Discuss the management of rangeland resources.
5. Understand the process of rangeland evaluation through a broad understanding of monitoring and production of these rangelands.
6. Gain a perspective of the correlation of rangelands and the economic principles guiding resource management.
7. Understand the process of rangeland condition.
8. Understand the concepts of stocking rates and usage of rangelands.
9. Gain a broad perspective of different classes of land ownership; Tribal, federal, private and state. 1
10. Recognize vegetative communities, ecological sites, plant physiology and application to rangeland management considerations.

RGSC 2996. Special Topics**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

RGSC 302V. Forestry and Society**3 Credits (3)**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.

RGSC 316. Rangeland Plants**3 Credits (2+3P)**

Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants.

RGSC 317. Rangeland Communities**3 Credits (3)**

Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

RGSC 318. Watershed Management**3 Credits (2+2P)**

Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality.

RGSC 325. Rangeland Restoration Ecology**3 Credits (3)**

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.

Prerequisite(s): Sophomore standing or consent of instructor.

RGSC 350. Special Topics**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

RGSC 357. Grass Taxonomy and Identification**3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Students must be Junior standing to enroll in this course.

RGSC 390. Internship**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

Prerequisite: consent of instructor.

RGSC 402. Seminar**1 Credit (1)**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

Prerequisite(s): Senior standing.

RGSC 402 H. Range Science Seminar**1 Credit (1)**

Taught with RGSC 402 with additional work.

Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status and senior standing.

RGSC 406. Rangeland Team Competition**1 Credit (1)**

Description and characteristics of range plants. May be repeated for a maximum of 4 credits.

RGSC 440. Rangeland Resource Ecology**3 Credits (3)**

Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.

Prerequisite(s): Senior standing.

RGSC 440 L. Rangeland Resource Ecology Lab**1 Credit (2P)**

Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. **Corequisite(s):** RGSC 440.

RGSC 448. Problems**1-4 Credits (1-4)**

Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

RGSC 452. Vegetation Measurements for Rangeland Assessment**4 Credits (2+4P)**

Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results.

Prerequisite(s): RGSC 294 and A ST 311.

RGSC 458. Livestock Behavior, Welfare and Handling**3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458

Prerequisite(s): RGSC 2110 or ANSC 1120.

RGSC 460. Rangeland and Natural Resource Planning and Management**4 Credits (3+3P)**

Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues.

Prerequisite(s): Senior or graduate student standing.

RGSC 485. Land Cover Analysis for Natural Resources**3 Credits (3)**

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis.

RGSC 509. Approaches to Rangeland Research**3 Credits (3)**

Experimental design and statistical analysis of experimental results.

Prerequisite(s): A ST 505 or consent of instructor.

RGSC 513. Advanced Rangeland Ecology**3 Credits (3)**

Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.

Prerequisite(s): RGSC 440 or equivalent.

RGSC 515. Graduate Seminar**1 Credit (1)**

Current topics. Graded S/U.

RGSC 516. Arid Land Management**3 Credits (3)**

Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.

RGSC 518. Watershed Methods and Management**3 Credits (3)**

Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.

RGSC 520. Arid Land Plant Herbivore Interactions**3 Credits (3)**

Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

RGSC 525. Advanced Rangeland Restoration Ecology**3 Credits (3)**

Theory and application of restoration ecology and the principles and practices of ecological restoration. Course emphasizes problems associated with rangeland degradation and highlights current restoration management actions. May be repeated up to 3 credits.

RGSC 550. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

RGSC 551. Earth Data Retrieval**3 Credits (3)**

This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: WSAM 551.

RGSC 557. Advanced Grass Taxonomy and Identification**3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit.

RGSC 575. Climate Studies, Water and Society**3 Credits (3)**

The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies. Crosslisted with: WSAM 575.

RGSC 585. Land Cover Analysis for Natural Resources**3 Credits (3)**

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: WSAM 585.

RGSC 589. Landscape Hydrology Modeling**3 Credits (3)**

The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools. Consent of Instructor required. Crosslisted with: WSAM 589.

RGSC 590. System Dynamics**3 Credits (3)**

This course takes a system dynamics approach to the study of economics and natural resources management. We will examine some of the example theories such as Solow-Swan model and endogenous growth theories as well as the tragedy of the commons, using system dynamics tools to uncover the feedback and explicitly examine its impact on the dynamic behavior of the system. Through these examples, we will learn how to develop, validate, and use system dynamics models for policy design and analysis. Crosslisted with: WSAM 590.

Learning Outcomes

1. identify common generic structures and behavioral modes in socioeconomic and ecological systems,
2. define important feedback theories that explain the behavioral modes in socioeconomic and ecological systems, and
3. implement the system dynamics method to translate the feedback theories into dynamic simulation models.

RGSC 598. Special Research Program**1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 599. Master's Thesis**15 Credits**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 600. Doctoral Research**1-15 Credits**

Research. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 616. Advanced Arid Land Management**3 Credits (3)**

In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

RGSC 620. Advanced Arid Land Plant-Herbivore Interactions**3 Credits (3)**

In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

RGSC 698. Special Research Programs**1-4 Credits (1-4)**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 700. Doctoral Dissertation**15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

Office Location: Knox Hall 202

Phone: (575) 646-2514

Website: <http://aces.nmsu.edu/academics/anrs/>

Animal Science (Animal Industry) - Bachelor of Science in Agriculture

The animal industry concentration includes courses that prepare you for work in many phases of the livestock industry, such as livestock production on farms and ranches, the meat industry, the feed industry, livestock breed associations, and livestock publications.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
English Composition - Level 1 ¹		4
English Composition - Level 2 ¹		3
Oral Communication		3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ²	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4

Choose one from the following: 3

ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	

Area V: Humanities ¹ 3

Area VI: Creative and Fine Arts ¹ 3

General Education Elective ¹ 3-4

Viewing A Wider World ³ 6

Departmental/College Requirements ⁴

ANSC 1110	Animal Science Careers	1
ANSC 1120	Introduction to Animal Science	3
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 1120L	Introduction to Animal Science Lab	1
ANSC 303	Livestock, Meat and Wool Evaluation	4
or ANSC 308	Horse Evaluation	
ANSC 304	Feeds and Feeding	3
ANSC 370	Anatomy and Physiology of Farm Animals	4
ANSC/RGSC 402	Animal Science Seminar (or)	1
or ANSC 402 H	Animal Science Seminar	
ANSC 421	Physiology of Reproduction	4
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3

Ag Electives: choose a total of 6 credit with no more than 3 credits in ANSC Experience 6

RGSC 2110	Introduction to Rangeland Management	
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
ANSC 1140	Introduction to Dairy Science	
ANSC 2310	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	

ANSC Experience

ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	

Concentration

AEEC 2120	Introduction to Food and Agribusiness Accounting	3
or ACCT 2110	Principles of Accounting I	
ANSC 2330	Animal Production	3
ANSC 2340	Genetics in Animal Science	3
or ANSC 305	Principles of Genetics	
ANSC 1170	Introduction to Animal Metabolism	3

Electives**Production Electives**

Select 9 credits from production courses offered in the department 9

ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	

Ranch Management Electives

Select three courses from the following: 9

AEEC 2140	Technology and Communication for Business Management	
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AEEC 350	Spreadsheet Applications in Food and Agriculture	
ANSC 383	Equine Reproductive Management	
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 488	Equine Nutrition and Exercise Physiology	
RGSC 316	Rangeland Plants	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
RGSC 458	Livestock Behavior, Welfare and Handling	
Or any AEEC or RGSC numbered 300 & above except AEEC 305 and AEEC 456		
Business Electives		
Select one from the following:		
AEEC 305	Marketing and Food Agricultural Products	
AEEC 456	Case Studies in Food and Agribusiness Management	
MGMT 361	Small Business Management	
MKTG 312	Personal Selling	
Or any BUSA, MGMT, MKTG numbered 300 & above that are not VWV courses		
Non-Departmental Requirements (in addition to Gen.Ed/VWV)		
A ST 311	Statistical Applications	3
Second Language: (not required)		
Electives, to bring the total to 120 ⁵		13-15
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1220G College Algebra or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1511G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Required of Industry and Science Options

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
MATH 1220G	College Algebra	3
ENGL 1110G	Composition I	4
ACES 1120	Freshman Orientation	1

Ag Elective: choose one based on interest		3
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
RGSC 2110	Introduction to Rangeland Management	

Credits 15

Semester 2

ANSC 1110	Animal Science Careers	1
ANSC 2330	Animal Production	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	1
ACOM 1130G	Effective Leadership and Communication in Agriculture	3

Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.

Credits 15

Second Year

Semester 1

ANSC 2340	Genetics in Animal Science	3
AEEC 2120	Introduction to Food and Agribusiness Accounting	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
ENGL 2210G	Professional & Technical Communication	3

Credits 14

Semester 2

ANSC 1170	Introduction to Animal Metabolism	3
ANSC 304	Feeds and Feeding	3
ECON 2120G	Principles of Microeconomics	3
Area VI: Creative and Fine Arts -see catalog for complete list ¹		3
Ranch Management Elective: - see degree plan for complete list		3

Credits 15

Third Year

Semester 1

ANSC 370	Anatomy and Physiology of Farm Animals	4
ANSC 303	Livestock, Meat and Wool Evaluation	4
or ANSC 308	or Horse Evaluation	
Viewing a Wider World class - see catalog for complete list ²		3
Area V: Humanities - see catalog for complete list ¹		3

Credits 14

Semester 2

ANSC 421	Physiology of Reproduction	4
Viewing a Wider World - see catalog for complete list ²		3
Ranch Management Elective - see degree plan for complete list		3
General Education Elective ¹		3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3

Credits 16

Fourth Year

Semester 1

ANSC 402	Animal Science Seminar	1
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3
A ST 311	Statistical Applications	3

Choose production course from degree plan	3
Choose Business Elective from degree plan	3
Credits	16
Semester 2	
Choose production course from degree plan	3
Choose production course from degree plan	3
Ranch Management Elective - see degree plan for complete list	3
Ag Elective - see degree plan for complete list. Recommend Internship	3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.	3
Credits	15
Total Credits	120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Animal Science (Science) - Bachelor of Science in Agriculture

The science concentration provides you with a strong background in technical science and prepares you for advanced studies leading to graduate or professional degrees.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
English Composition - Level 1 ¹		4
English Composition - Level 2 ¹		3
Oral Communication		3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ²	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (required for science option)	4
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Viewing A Wider World ³ **6**

Departmental/College Requirements ⁴

ANSC 1110	Animal Science Careers	1
ANSC 1120	Introduction to Animal Science	3
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 1120L	Introduction to Animal Science Lab	1
ANSC 303	Livestock, Meat and Wool Evaluation	4
or ANSC 308	Horse Evaluation	
ANSC 304	Feeds and Feeding	3
ANSC 370	Anatomy and Physiology of Farm Animals	4
ANSC/RGSC 402	Animal Science Seminar (or)	1
or ANSC 402 H	Animal Science Seminar	
ANSC 421	Physiology of Reproduction	4
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3

Ag Electives: choose a total of 6 credit with no more than 3 credits in ANSC Experience **6**

RGSC 2110	Introduction to Rangeland Management	
ANSC 1140	Introduction to Dairy Science	
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
ANSC 2310	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	
ANSC Experience		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	

<i>Concentration</i>		
ANSC 305	Principles of Genetics	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
BCHE 395	Biochemistry I	3
or BCHE 341	Survey of Biochemistry	

Choose one Chemistry requirement from the following to complete the Chemistry requirement: **4-8**

If the CHEM 313 set is selected all three courses must be completed

CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory (Students pursuing vet school or grad school must take CHEM 313, 314, 315)	
CHEM 2115	Survey of Organic Chemistry and Laboratory	

Production Electives
Select two from the following: **6**

ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	

Designated Electives
Select one from the following: **4**

MATH 1511G	Calculus and Analytic Geometry I	
MATH 1521G	Calculus and Analytic Geometry II	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Select one from the following:		3
ANSC 462	Parasitology	
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 484	Ruminant Nutrition	
BIOL 311	General Microbiology	
TOX 361	Basic Toxicology	
TOX 461	Toxicology I	
Or any 300 level or higher Biol not counting BIOL 305		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		9-14
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1220G College Algebra or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1511G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Required of Industry and Science Options

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G or MATH 1511G	College Algebra ¹ or Calculus and Analytic Geometry I	3
ANSC 1120 or ANSC 1120H	Introduction to Animal Science or Introduction to Animal Science Honors	3
ANSC 1120L	Introduction to Animal Science Lab	1
ACES 1120	Freshman Orientation	1
Choose from one of the following AG Elective Options:		3
RGSC 2110	Introduction to Rangeland Management	
ANSC 1160	Introductory Horse Science	

ANSC 1180	Companion Animal in Society	
Credits		15
Semester 2		
ACOM 1130G or COMM 1115G	Effective Leadership and Communication in Agriculture ¹ or Introduction to Communication	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
ANSC 1110	Animal Science Careers	1
Area V: Humanities Course ²		3
Area VI: Creative and Fine Arts Course ²		3
Credits		15
Second Year		
Semester 1		
ENGL 2210G	Professional & Technical Communication ¹	3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
ANSC 304	Feeds and Feeding ¹	3
Credits		15
Semester 2		
A ST 311	Statistical Applications	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Area IV: Social and Behavioral Science Course		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
VWW: Viewing a Wider World Course ³		3
Choose from one of the following AG Elective Options:		3
ANSC 2310	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Credits		16
Third Year		
Semester 1		
ANSC 370	Anatomy and Physiology of Farm Animals (Fall Only) ¹	4
Choose from one of the following:		4
ANSC 303	Livestock, Meat and Wool Evaluation (Fall Only)	
ANSC 308	Horse Evaluation (Spring Only)	
CHEM 313	Organic Chemistry I ¹	3
CHEM 303	Organic Supplemental Instruction I	1
ANSC 305	Principles of Genetics ¹	3
Credits		15
Semester 2		
ANSC 421	Physiology of Reproduction (Spring Only) ¹	4

CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
CHEM 304	Organic Supplemental Instruction II	1
Choose from one of the following:		4
MATH 1511G	Calculus and Analytic Geometry I ¹	
MATH 1521G	Calculus and Analytic Geometry II ¹	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ¹	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ¹	
Elective Course		1
Credits		15

Fourth Year**Semester 1**

ANSC 422	Animal Nutrition ¹	3
ANSC 423	Animal Breeding ¹	3
ANSC 402 or ANSC 402 H or RGSC 402	Animal Science Seminar or Animal Science Seminar or Seminar	1
Choose from one of the following:		3
ANSC 462	Parasitology	
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 484	Ruminant Nutrition	
TOX 361	Basic Toxicology	
TOX 461	Toxicology I	
Elective Course		3
Elective Course		2
Credits		15

Semester 2

BCHE 395 or BCHE 341	Biochemistry I ¹ or Survey of Biochemistry	3
Choose any two from the following courses:		6
ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	
VWW: Viewing a Wider World Course ³		3
Elective Course		2
Credits		14

Total Credits 120

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Range Science - Bachelor of Science in Agriculture

The following course work prepares you for study and management of rangelands through an integrated ecological approach with special

emphasis on rangeland plants, livestock, wildlife, soils and watersheds. The course work is also well designed for those who want to continue study in graduate school. Any undergraduate student majoring in Range Science must earn a grade of C- or higher in Range Science (RGSC prefix) courses to satisfy degree requirements. Students earning a D or F in a Range Science (RGSC prefix) course will be expected to repeat that course until the student earns a grade of C- or higher.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
or COMM 1115G Introduction to Communication		
<i>Area II: Mathematics</i> ²		
MATH 1220G	College Algebra	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Select one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area V: Humanities</i>		
PHIL 1145G	Philosophy, Law, and Ethics	3
or PHIL 2110G Introduction to Ethics		
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Range Science Core</i>		
RGSC 1110	The Range Science Profession	1
RGSC 2110	Introduction to Rangeland Management	3
RGSC 316	Rangeland Plants	3
RGSC 317	Rangeland Communities	3
RGSC 318	Watershed Management	3
RGSC 325	Rangeland Restoration Ecology	3
RGSC 357	Grass Taxonomy and Identification	3
RGSC 402	Seminar	1
or RGSC 402 H Range Science Seminar		
RGSC 440	Rangeland Resource Ecology	3
RGSC 440 L	Rangeland Resource Ecology Lab	1

RGSC 452	Vegetation Measurements for Rangeland Assessment	4
RGSC 460	Rangeland and Natural Resource Planning and Management	4
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Other Required Courses</i>		
A ST 311	Statistical Applications	3
ANSC 1170	Introduction to Animal Metabolism	3-4
or CHEM 2115	Survey of Organic Chemistry and Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
EPWS 314	Plant Physiology	3
FWCE 2110	Principles of Fish and Wildlife Management	3
Select one from the following:		4
GEOG 381	Cartography and Geographic Information Systems	
or FWCE 471	GIS for Natural Resource Scientists	
A 300/400-level GIS Course		
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
SOIL 472	Soil Morphology and Classification	4
<i>Natural Resource Management</i>		
Choose two courses from the following:		6
AEEC 337V	Natural Resource Economics	
AEEC 384V	Water Resource Economics	
AEEC 385	Applied Production Economics	
AEEC 456	Case Studies in Food and Agribusiness Management	
FWCE 1110G	Introduction to Natural Resources Management	
FWCE 2110	Principles of Fish and Wildlife Management	
FWCE 437	Wildlife Damage Management	
RGSC 302V	Forestry and Society	
<i>ANSC Elective</i>		3
ANSC 1120	Introduction to Animal Science	
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 304	Feeds and Feeding	
ANSC 351V	Agricultural Animals of the World	
ANSC 422	Animal Nutrition	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
ANSC 458	Livestock Behavior, Welfare and Handling	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		12-13
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

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First Year

Semester 1		Credits
ENGL 1110G	Composition I	4
MATH 1220G	College Algebra	3
RGSC 1110	The Range Science Profession	1
RGSC 2110	Introduction to Rangeland Management	3
ACES 1120	Freshman Orientation	1
Area VI: Creative and Fine Arts ²		3
Credits		15

Semester 2

ACOM 1130G	Effective Leadership and Communication in Agriculture	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
Choose from one of the following Area I courses: ²		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication ¹	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
Choose from one of the following Area IV courses: ²		3
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 2110G	Introduction to Ethics	
Elective Course		1
Credits		15

Second Year

Semester 1		Credits
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
Choose from one of the following Area IV General Education Courses: ²		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Elective Course		3
Credits		15

Semester 2

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory ¹	4
Choose from one of the following:		3-4
ANSC 1170	Introduction to Animal Metabolism (Spring Only) ¹	
CHEM 2115	Survey of Organic Chemistry and Laboratory (Fall and Spring) ¹	
A ST 311	Statistical Applications ¹	3
RGSC 317	Rangeland Communities (Spring Only)	3
Elective Course		2

Credits **15-16**

Third Year**Semester 1**

RGSC 452	Vegetation Measurements for Rangeland Assessment (Fall Only) ¹	4
RGSC 316	Rangeland Plants (Fall Only)	3
RGSC 325	Rangeland Restoration Ecology (Fall Only)	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory ¹	4
Elective Course		2

Credits **16**

Semester 2

RGSC 357	Grass Taxonomy and Identification (Spring Only)	3
RGSC 318	Watershed Management (Spring Only)	3
Choose from one of the following:		3-4

GEOG 381	Cartography and Geographic Information Systems	
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Any 300-level or 400-level GIS Course

Choose from one of the following Animal Science courses: **3**

ANSC 1120	Introduction to Animal Science	
ANSC 304	Feeds and Feeding	
ANSC 351V	Agricultural Animals of the World	
ANSC 422	Animal Nutrition	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
ANSC 458	Livestock Behavior, Welfare and Handling	
Elective Course		3

Credits **15-16**

Fourth Year**Semester 1**

RGSC 402	Seminar	1
RGSC 440 & 440 L	Rangeland Resource Ecology and Rangeland Resource Ecology Lab (Fall Only)	4
SOIL 472	Soil Morphology and Classification (Fall Only) ¹	4
VWW: Viewing a Wider World Course ³		3
Choose from one of the following Natural Resource Management courses:		3-4

AEEC 315V	World Agriculture and Food Problems (Fall Only)	
AEEC 384V	Water Resource Economics (Spring Only)	
AEEC 385	Applied Production Economics (Fall Only)	
AEEC 456	Case Studies in Food and Agribusiness Management (Spring Only)	

FWCE 1110G	Introduction to Natural Resources Management	
FWCE 2110	Principles of Fish and Wildlife Management	
FWCE 437	Wildlife Damage Management	
RGSC 302V	Forestry and Society	
Elective Course		1

Credits **16-17**

Semester 2

RGSC 460	Rangeland and Natural Resource Planning and Management (Spring Only)	4
EPWS 314	Plant Physiology (Spring Only) ¹	3
Choose from one of the following Natural Resource Management courses:		3-4

AEEC 315V	World Agriculture and Food Problems (Fall Only)	
AEEC 384V	Water Resource Economics (Spring Only)	
AEEC 385	Applied Production Economics (Fall Only)	
AEEC 456	Case Studies in Food and Agribusiness Management (Spring Only)	
FWCE 1110G	Introduction to Natural Resources Management	
FWCE 2110	Principles of Fish and Wildlife Management	
FWCE 437	Wildlife Damage Management	
RGSC 302V	Forestry and Society	
VWW: Viewing a Wider World Course		3

Credits **13-14**

Total Credits **120-124**

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Dairy Science - Undergraduate Minor

A minor in Dairy Science consists of at least 18 credits.

Prefix	Title	Credits
Core ANSC courses (all of the following are required)		12
ANSC 1120	Introduction to Animal Science	
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 1140	Introduction to Dairy Science	
ANSC 304	Feeds and Feeding	
ANSC Elective Course		
Dairy Science Electives:		6
ANSC 427	Dairy Production	
ANSC 468	Advanced Dairy Herd Management	
<i>ANSC Science Experience (no more than 3 credits; must be in field of dairy science):</i>		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Total Credits		18

Horse Management - Undergraduate Minor

A minor in Horse Management consists of at least 18 credits.

Prefix	Title	Credits
Required Courses		
<i>All of the following:</i>		
ANSC 1160	Introductory Horse Science	3
ANSC 2150	Management of Equine Operations	3
ANSC 308	Horse Evaluation	4
ANSC 425	Horse Science and Management	3
Choose 3 credits of the following:		3
ANSC 2120	Equine Management	
ANSC 320	Equine Behavior and Training	
ANSC 321	Advanced Equine Behavior and Training	
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Choose one of the following:		3
ANSC 383	Equine Reproductive Management	
ANSC 488	Equine Nutrition and Exercise Physiology	
Total Credits		19

Human Animal Interaction - Undergraduate Minor

A minor in Human Animal Interaction consists of at least 18 credits.

Prefix	Title	Credits
Required Courses		
ANSC 1180	Companion Animal in Society	3
ANSC 2140	Introduction to Companion Animal Science	3
ANSC 312V	Companion Animals and the Human- Animal Interaction	3
ANSC 390	Internship ¹	3
ANSC 411	Canine and Feline Behavior and Training	3
ANSC 412	Canine and Feline Health and Diseases	3
Total Credits		18

¹ Must complete 3 credit hours of internship

Livestock Production - Undergraduate Minor

A minor in Livestock Production consists of at least 18 credits. Animal science majors may NOT minor in Livestock Production.

Prefix	Title	Credits
Core ANSC Courses		
All of the following		
ANSC 1120	Introduction to Animal Science	3
ANSC 304	Feeds and Feeding	3
<i>Production Electives</i>		
Choose 6 credits of the following:		6

ANSC 424	Swine Production
ANSC 425	Horse Science and Management
ANSC 426	Beef Production: Cow-Calf Management
ANSC 427	Dairy Production
ANSC 428	Sheep and Wool Production
ANSC 429	Beef Production: Feedlot Management
ANSC Electives	
Choose 6 credits of the following:	
ANSC 301	Animal and Carcass Evaluation
Or any ANSC course numbered 300 and above ¹	
Total Credits	

¹ Only one ANSC VWW is eligible towards minor

Ranch Management - Undergraduate Minor

The Ranch Management minor consists of at least 18 credits. Animal science majors may NOT minor in ranch management.

Prefix	Title	Credits
Core ANSC Courses		
ANSC 1120	Introduction to Animal Science	3
ANSC 304	Feeds and Feeding	3
Production Electives		
Choose 2 of the following		6
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
Range Electives		
RGSC 2110	Introduction to Rangeland Management	3
Choose 3 credits from the following		3
RGSC 302V	Forestry and Society	
RGSC 316	Rangeland Plants	
RGSC 317	Rangeland Communities	
RGSC 318	Watershed Management	
RGSC 440	Rangeland Resource Ecology	
Total Credits		18

Range Science - Undergraduate Minor

A minor in Range Science consists of at least 18 credits in courses with a RGSC prefix and achieve a C- or higher in all RGSC classes.

Prefix	Title	Credits
Choose 18 credits from the following courses		18
RGSC 2110	Introduction to Rangeland Management	
RGSC 302V	Forestry and Society	
RGSC 316	Rangeland Plants	
RGSC 317	Rangeland Communities	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	

RGSC 440 L	Rangeland Resource Ecology Lab
RGSC 452	Vegetation Measurements for Rangeland Assessment ¹
RGSC 458	Livestock Behavior, Welfare and Handling
RGSC 460	Rangeland and Natural Resource Planning and Management
<hr/>	
Total Credits	18

¹ RGSC 2110 Introduction to Rangeland Management & A ST 311 Statistical Applications are pre-requisites for this course

Entomology, Plant Pathology and Weed Science

Undergraduate Program Information

Specific courses that meet these and the university general education requirements and additional courses in biology, chemistry, mathematics and seminar are included below in departmental requirements. A total of 120 credits are required for graduation. At least 48 credits must be 300-level courses and above. Schedules in specific semesters will be developed with the help of a student's academic advisor.

Graduate Program Information

The complexity of managing insects, plant diseases, and weeds is increasing environmental concerns, costs, and regulations requiring an integrated approach to management strategies. Future professionals in integrated pest management will be ecologically oriented, trained to manipulate biological and cultural technologies while minimizing chemical control options. The Master of Science degree program in agricultural biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound protection of plants and animals from a wide and varied spectrum of pests. Students will be prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Ph.D. programs. Specific opportunities will include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, and industry research and environmental technicians. There is currently a strong need for MS graduates trained in these areas, and the demand is expected to increase dramatically.

Students may wish to concentrate their graduate program in entomology, plant pathology, or weed science, or conversely may wish to be broadly trained in all three pest-management disciplines. Most students will be expected to complete a thesis. A non-thesis option is available, depending on prior training and experience and subject to approval by the department head. A nonthesis research option requires completion of a research paper, suitable as judged by the student's graduate committee, for journal publication. Completion of an undergraduate degree essentially equivalent to that offered by the department is required for admission to the MS graduate program. Qualifications for admission will be reviewed by the departmental Graduate Admissions committee. Prospective graduate students must have at least a 3.0 undergraduate GPA, complete the GRE, and submit an official transcript, a letter of intent and three letters of recommendation.

Degrees for the Department

Bachelor Degree(s)

- Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture (p. 323)
- Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 325)
- Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 326)
- Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 327)
- Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture (p. 329)
- General Agriculture - Bachelor of Science in Agriculture (p. 331)

Master Degree(s)

- Agricultural Biology - Master of Science (p. 93)

Minors for the Department

- Entomology - Undergraduate Minor (p. 333)
- Pest Management - Undergraduate Minor (p. 333)
- Plant Pathology - Undergraduate Minor (p. 333)
- Weed Science - Undergraduate Minor (p. 333)

Professor, Gerald K. Sims, Department Head

Professors Creamer, Bundy, Sanogo, Thomas, Thompson; **Associate Professors** Hanson, Mesbah, Pierce, Romero, Schutte; **Assistant Professors** Lehnhoff; **Affiliated Faculty** Schroeder, Sweet, Bleiweiss; **College Assistant Professor** Lewis; **College Associate Professor** Randall; **Emeritus Professor** Arnold, Richman

G.K. Sims, Department Head, Ph.D. (Purdue)– soil microbiology; weed science; C. S. Bundy, Ph.D. (Georgia)– entomology; R. Creamer, Ph.D. (California-Davis)– plant pathology; N.P. Goldberg, Ph.D. (Arizona)– plant pathology; S. Hanson, Ph.D. (University of Wisconsin)– molecular plant pathology; E. Lehnhoff, Ph.D. (Montana State) Ecology and Environmental Science; B. E. Lewis, M.S. (New Mexico State)– economic entomology; A.O. Mesbah, Ph.D. (University of Wyoming)– weed science; J. Breen Pierce (Rutgers)– entomology; J. Randall, Ph.D. (New Mexico State University)– plant pathology; A. Romero, Ph.D. (University of Kentucky)– Entomology; S. Sanogo, Ph.D. (Pennsylvania State)– plant pathology; B. Schutte, Ph.D. (Ohio State)– Horticulture & Crop Science; C. A. Sutherland, Ph.D. (Oregon State)– extension entomology; S. H. Thomas, Ph.D. (Iowa State)– nematology; D.C. Thompson, Ph.D. (Colorado State)– entomology.

Entomology, Plant Pathology and Weed Science Courses

EPWS 1110G. Applied Biology

3 Credits (3)

Introduction to applied biology and ecology focusing on insects, plants and pathogens in natural areas, crops and urban settings. EPWS 1110L is strongly recommended to take in the same semester. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 1110L. Applied Biology Lab

1 Credit (1)

Study of applied biology and ecology of insects, plants and pathogens in natural areas, crops, and urban settings. EPWS 1110 strongly recommended to take in the same semester. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 2996. Special Topics

1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

EPWS 300. Special Topics

1-4 Credits

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

EPWS 301. Agricultural Biotechnology

3 Credits (2+2P)

The principles of molecular biology will be introduced and used to explore the past, present, and future applications of biotechnology in agriculture. Specific topics include methodologies for making transgenic plants with increased pest resistance, the use of biotechnology in pest detection, and improving nutritional value. The laboratory will provide students with hands-on experience with equipment used for biotechnology research.

Prerequisites: CHEM 1225G, BIOL 2610G, or BIOL 2110G.

EPWS 302. General Entomology

4 Credits (4)

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 302 H. General Entomology Honors

4 Credits (4)

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families. Students in the Honors section will be given the opportunity to enhance their understanding of entomology with a more detailed examination into the lives of these fascinating organisms.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 303. Economic Entomology

3 Credits (3+2P)

Identification and life cycles of insects of economic significance, their relationship to humans and agriculture including biological interactions and controls. May be repeated up to 3 credits.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 310. Plant Pathology

4 Credits (3+2P)

Causes and methods of prevention and treatment of diseases in plants.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 310 H. Plant Pathology Honors

4 Credits (4)

Cause and methods of prevention and treatment of diseases in plants. Students with an Honors designation will have additional project and report assignments.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 311. Introduction to Weed Science

4 Credits (3+2P)

Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Crosslisted with: AGRO 311.

Prerequisite(s): CHEM 1215G, and BIOL 2110G.

EPWS 314. Plant Physiology

3 Credits (3)

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Same as BIOL 314.

Prerequisites: BIOL 2110G, CHEM 1225G.

EPWS 325V. Insects, Humans, and the Environment

3 Credits (3)

Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present day, and future impacts in underdeveloped, developing, and developed civilizations.

EPWS 373. Fungal Biology

3 Credits (2+2P)

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 373.

Prerequisites: EPWS 310 or BIOL 311, or consent of instructor.

EPWS 380V. Science & Society**3 Credits (3)**

Analysis and evaluation of how human activities affect the earth's environment or ecosystems. Several examples, from global issues to local issues will be studied in detail. Current science and the intersection of science and public policy will be discussed in relation to problems like world population, agricultural productivity, deforestation, medical advances, and future prospects for the environment. May be repeated up to 3 credits.

EPWS 390. Internship**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits. Graded S/U.

Prerequisite: consent of instructor.

EPWS 420. Environmental Behavior of Pesticides**3 Credits (3)**

Behavior of pesticide compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 447. Seminar**1 Credit (1)**

Organization and techniques for the oral presentation of research information. Restricted to: Main campus only.

EPWS 447 H. Seminar Honors**1 Credit (1)**

Organization and techniques for the oral presentation of research information. Students taking EPWS 447 H will have the additional assignment of making a poster on either scientific research or a scientific topic.

Prerequisite(s): Honors eligibility requirements.

EPWS 449. Special Problems**1-3 Credits**

Individual investigation in specific areas of entomology, plant pathology or plant physiology. Maximum of 3 credits per semester and a grand total of 6 credits.

EPWS 451. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Prerequisite: consent of instructor.

EPWS 455. Advanced Integrated Pest Management**3 Credits (3)**

Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Crosslisted with: EPWS 505.

Prerequisite(s): Either EPWS 303 or EPWS 310 or EPWS 311, or consent of instructor.

EPWS 456. Biological Control**3 Credits (3)**

Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506. Students should complete an introductory course in entomology prior to enrollment. May be repeated up to 3 credits.

EPWS 462. Parasitology**3 Credits (3)**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.

EPWS 462 L. Parasitology Lab**1 Credit (1)**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife. May be repeated up to 1 credits.

EPWS 471. Plant Mineral Nutrition**3 Credits (3)**

Same as HORT 471 and AGRO 471.

EPWS 486. Plant Virology**3 Credits (3)**

An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.

EPWS 492. Diagnosing Plant Disorders**3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as AGRO 492 and HORT 492.

Prerequisites: EPWS 303, EPWS 310.

EPWS 502. General Entomology**4 Credits (4)**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

Prerequisite(s): Either BIOL 2610G or BIOL 2110G.

EPWS 505. Advanced Integrated Pest Management**3 Credits (3)**

Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Crosslisted with: EPWS 455.

Prerequisite(s): EPWS 303 or EPWS 310 or EPWS 311 or consent of instructor.

EPWS 506. Biological Control**3 Credits (3)**

Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. An introductory course in entomology should be completed before enrollment. Credit cannot be given for both EPWS 456 and EPWS 506. May be repeated up to 3 credits.

EPWS 511. Introduction to Weed Science (f)**4 Credits (3+2P)**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Crosslisted with: AGRO 511.

Prerequisite(s): CHEM 1215G and BIOL 2110G.

EPWS 514. Plant Physiology**3 Credits (3)**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development.

Prerequisite(s): BIOL 2110G, CHEM 1225G.

EPWS 520. Environmental Behavior of Pesticides (so)**3 Credits (3)**

Behavior of these compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 525. Scientific Writing- How to be a Productive and Effective Writing**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, HORT 525 and SOIL 525.

EPWS 549. Special Problems**1-4 Credits**

Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.

EPWS 551. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

EPWS 560. Ecology and Management of Invasive Plant Species**3 Credits (3)**

An overview of the causes and consequences of plant invasions and invasive plant management, with a focus on critical examination of current literature and paradigms.

Learning Outcomes

1. Students will gain practical and theoretical knowledge to facilitate improved vegetation management by engaging in critical thinking and discussion on a wide variety of topics related to invasive plants.
2. Students will understand why plants invade and how to facilitate prevention of invasion in natural and rangeland areas
3. Further, students will gain knowledge of the tools and practices of invasive plant management.

EPWS 573. Fungal Biology**3 Credits (2+2P)**

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 573.

Prerequisite: EPWS 310 or consent of instructor.

EPWS 590. Graduate Seminar**1 Credit (1)**

Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree.

EPWS 598. Graduate Internship**1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

EPWS 599. Master's Thesis**15 Credits**

Thesis.

Name: Entomology, Plant Pathology & Weed Science Department

Office Location: Skeen Hall, Room N141

Phone: (575) 646-3225

Email: eppwsdep@nmsu.edu

Website: <http://eppws.nmsu.edu/> (<http://eppws.nmsu.edu>)

Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Applied Biology concentration prepares you for professional advancement including admittance to medical, dental, veterinary and graduate schools. Students interested in the health professions must register with the Health Professional Advisory Committee no later than the sophomore year. Students should check the specific entrance requirements for the professional or graduate school of their choice prior to selecting electives within this option.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		

English Composition - Level 1

ENGL 1110G	Composition I	4
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English Composition - Level 2

Choose one from the following:		3
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ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	

Oral Communication

Choose one from the following:		3
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ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	

Area II: Mathematics

MATH 1220G	College Algebra ¹	3
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Area III/IV: Laboratory Sciences and Social/Behavioral Sciences

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	

Area IV: Social/Behavioral Sciences Course (3 credits) ²

Area V: Humanities ²		3
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Area VI: Creative and Fine Arts ²		3
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General Education Elective

BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
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Viewing a Wider World ³		6
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One must be from outside of the College of ACES

Departmental/College Requirements

CHEM 1216G, CHEM 1226G and BIOL 2610G will count towards Departmental/College and General Education Requirements

A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1

Concentration Coursework

BCHE 341	Survey of Biochemistry	4
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 1250G	Trigonometry & Pre-Calculus	4
MATH 1511G	Calculus and Analytic Geometry I	4
PHYS 1230G	Algebra-Based Physics I	3
or PHYS 2230G	General Physics for Life Science I	
PHYS 1230L	Algebra-Based Physics I Lab	1

or PHYS 2230L	Laboratory to General Physics for Life Science I	
Choose 6-8 credits from the following:		6-8

ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 486	Plant Virology	

Non- Departmental Requirements (in addition to Gen.Ed/VWW)**Second Language: (not required)**

Electives, to bring the total credits to 120 ⁴		14-16
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Suggested Electives

MATH 1521G	Calculus and Analytic Geometry II	
PHYS 1240G	Algebra-Based Physics II	
or PHYS 2240G	General Physics for Life Science II	

Total Credits		120
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¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
EPWS 1110	Applied Biology	4
& 1110L	and Applied Biology Lab	
ACES 1120	Freshman Orientation	1
Area IV: Social and Behavioral Science Course ²		3
	Credits	15

Semester 2

ENGL 2210G	Professional & Technical Communication ¹	3
MATH 1250G	Trigonometry & Pre-Calculus ¹	4
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution ¹	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3

Area V: Humanities Course ²		3
Credits		16
Second Year		
Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 313 or BIOL 322	Structure and Function of Plants or Zoology	3
VWW: Viewing a Wider World Course ³		3
Area VI: Creative and Fine Arts Course ²		3
Credits		17
Semester 2		
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
BIOL 311	General Microbiology ¹	3
Elective Course		1
Credits		13
Third Year		
Semester 1		
CHEM 313	Organic Chemistry I	3
A ST 311	Statistical Applications	3
EPWS 302	General Entomology	4
Choose from one of the following: ¹		3
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
VWW: Viewing a Wider World Course ³		3
Credits		16
Semester 2		
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
EPWS 301	Agricultural Biotechnology ¹	3
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ¹	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Elective Course		3
Credits		15
Fourth Year		
Semester 1		
BCHE 341	Survey of Biochemistry ¹	4
EPWS 310	Plant Pathology (Fall Only) ¹	4
EPWS 311	Introduction to Weed Science (Fall Only) ¹	4
AGRO 305	Principles of Genetics ¹	3
Credits		15
Semester 2		
EPWS 447	Seminar	1
Choose from one of the following: ¹		3
ANSC 370	Anatomy and Physiology of Farm Animals	

BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 486	Plant Virology	
Elective Course		3
Elective Course		3
Elective Course		3
Credits		13
Total Credits		120

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Applied Microbiology biotin prepare you for professional positions in algal biofuels, environmental monitoring and improvement, industrial applications of microbiology, food sanitation, research or graduate study.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3

ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2130G	Advanced Composition	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social/Behavioral Sciences Course (3 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World ³		6
One must be from outside of the College of ACES		
Departmental/College Requirements		
CHEM 1216G, CHEM 1226G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
<i>Concentration Coursework</i>		
BCHE 341	Survey of Biochemistry	4
BIOL 311 L	General Microbiology Laboratory	2
BIOL 451	Physiology of Microorganisms	3
BIOL 473	Ecology of Microorganisms	3
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
EPWS 373	Fungal Biology	3
EPWS 420	Environmental Behavior of Pesticides	3
EPWS 486	Plant Virology	3
MATH 1430G	Applications of Calculus I	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4

Select 6-7 credits from the following: 6-7

AGRO 471	Plant Mineral Nutrition
BIOL 477	Applied and Environmental Microbiology
ENVS 301	Principles of Ecology
ENVS 370	Environmental Soil Science
EPWS 455	Advanced Integrated Pest Management
EPWS 462	Parasitology
EPWS 492	Diagnosing Plant Disorders
FSTE 320	Food Microbiology
SOIL 2110	Introduction to Soil Science
SOIL 312	Soil Management and Fertility
SOIL 476	Soil Microbiology
TOX 361	Basic Toxicology
Second Language: (not required)	
Electives, to bring the total credits to 120 ⁴	
Total Credits	
120	

¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

Agricultural Biology (Entomology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Entomology concentration prepares you for graduate degrees in entomology. Emphasis is placed on a broad background in field and laboratory aspects of insect biology and management.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48

credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World ³		6
One must be from outside the College of ACES		
Departmental/College Requirements		
CHEM 1215G, CHEM 1225G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
<i>Concentration Coursework</i>		
MATH 1430G	Applications of Calculus I	3
BIOL 465	Invertebrate Zoology	4

CHEM 2115	Survey of Organic Chemistry and Laboratory	4
EPWS 303	Economic Entomology	3
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 462	Parasitology	3
EPWS 492	Diagnosing Plant Disorders	3
Select at least three courses from the following:		7-11
EPWS 314	Plant Physiology	
EPWS 451	Special Topics	
EPWS 486	Plant Virology	
BIOL 301	Principles of Ecology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
SOIL 2110	Introduction to Soil Science	
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 436	Disease Vector Biology	
BIOL 462	Conservation Biology	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 480	Animal Behavior	
GENE 452	Applied Bioinformatics	
ENVS 301	Principles of Ecology	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		9-13
Total Credits		120

¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix)

course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Environmental Biology concentration prepares you for professional positions in environmental impact, regulation, compliance and improvement.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World ³		6
One must be from outside of the College of ACES		
Departmental/College Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1

EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
<i>Concentration Coursework</i>		
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
ENVS 301	Principles of Ecology	3
EPWS 380V	Science & Society	3
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 492	Diagnosing Plant Disorders	3
MATH 1430G	Applications of Calculus I	3
PHYS 1230G	Algebra-Based Physics I	4
& PHYS 1230L	and Algebra-Based Physics I Lab	
SOIL 2110	Introduction to Soil Science	3
TOX 361	Basic Toxicology	3
Select at least two courses from the following:		5-8
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
BCHE 341	Survey of Biochemistry	
ENVS 370	Environmental Soil Science	
EPWS 420	Environmental Behavior of Pesticides	
EPWS 451	Special Topics	
GEOG 381	Cartography and Geographic Information Systems	
SOIL 312	Soil Management and Fertility	
TOX 361	Basic Toxicology	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		6-9
EPWS 325V	Insects, Humans, and the Environment (recommended)	
Total Credits		120

¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
EPWS 1110 & 1110L	Applied Biology and Applied Biology Lab	4
ACES 1120	Freshman Orientation	1
Area IV: Social and Behavioral Science Course ²		3
Credits		15

Semester 2		
ENGL 2210G	Professional & Technical Communication ¹	3
MATH 1430G	Applications of Calculus I ¹	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution ¹	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area V: Humanities Course ²		3
Credits		15

Second Year

Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
EPWS 380V	Science & Society	3
Area VI: Creative and Fine Arts Course ²		3
Elective Course		1
Credits		15

Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
BIOL 311	General Microbiology ¹	3
BIOL 313 or BIOL 322	Structure and Function of Plants (Fall Only) ¹ or Zoology	3
VWW: Viewing a Wider World Course ³		3
Credits		14

Third Year

Semester 1		
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
AGRO 305	Principles of Genetics	3
SOIL 2110	Introduction to Soil Science	3
EPWS 310	Plant Pathology (Fall Only) ¹	4
A ST 311	Statistical Applications ¹	3
Credits		17

Semester 2		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
EPWS 301	Agricultural Biotechnology (Spring Only) ¹	3
VWW: Viewing a Wider World Course ³		3
Departmental Elective Course ⁴		3
Elective Course		3
Credits		16

Fourth Year

Semester 1		
EPWS 311	Introduction to Weed Science	4
EPWS 302	General Entomology	4

EPWS 492	Diagnosing Plant Disorders	3
TOX 361	Basic Toxicology	3
Elective Course		1

Credits 15

Semester 2		
EPWS 447	Seminar	1
EPWS 455	Advanced Integrated Pest Management (Odd Year Spring Only) ¹	3
ENVS 301	Principles of Ecology	3
EPWS 314	Plant Physiology ¹	3
Departmental Elective Course ⁴		3

Credits 13**Total Credits 120**

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Departmental Elective Course List (two required):

- AGRO 365 Principles of Crop Production (Odd Years Fall Only)
- AGRO 471 Plant Mineral Nutrition (Odd Years Spring Only)
- BCHE 341 Survey of Biochemistry
- EPWS 325V Insects, Humans, and the Environment
- EPWS 420 Environmental Behavior of Pesticides
- EPWS 451 Special Topics (Spring Only)
- ENVS 370 Environmental Soil Science
- GEOG 381 Cartography and Geographic Information Systems

Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Pest Biology and Management concentration prepares you for careers such as insect, weed and disease management; in both field and urban environments, including IPM and Sustainable/Organic Techniques research technician; federal and state agencies; border security; agricultural consulting; and extension positions.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ²	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 Credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World		6
One must be from outside the College of ACES		
Departmental/College Requirements		
CHEM 1215G, CHEM 1225G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1

<i>Concentration Coursework</i>		
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 462	Parasitology	3
EPWS 492	Diagnosing Plant Disorders	3
MATH 1430G	Applications of Calculus I	3
PHYS 1230G	Algebra-Based Physics I	4
& PHYS 1230L	and Algebra-Based Physics I Lab	
SOIL 2110	Introduction to Soil Science	3
SOIL 312	Soil Management and Fertility	3
TOX 361	Basic Toxicology	3
Select one from the following:		3
BIOL 312	Plant Taxonomy	
RGSC 316	Rangeland Plants	
RGSC 325	Rangeland Restoration Ecology	
Select 3 credits from the following:		3
EPWS 451	Special Topics	
EPWS 486	Plant Virology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
BIOL 301	Principles of Ecology	
RGSC 317	Rangeland Communities	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		8
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
MATH 1220G	College Algebra	3
EPWS 1110 & 1110L	Applied Biology and Applied Biology Lab	4
ENGL 1110G	Composition I	4
ACES 1120	Freshman Orientation	1

General Education Course (Area V, VI, or VI) ¹	3
Credits	15
Spring	
ACOM 1130G Effective Leadership and Communication in Agriculture or COMM 1115G or Introduction to Communication	3
ENGL 2210G Professional & Technical Communication	3
BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution	3
General Education Course (Area V, VI, or VI) ¹	3
General Education Course (Area V, VI, or VI) ¹	3
Credits	15
Second Year	
Fall	
MATH 1430G Applications of Calculus I	3
BIOL 2110G Principles of Biology: Cellular and Molecular Biology	3
CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors	4
Elective Course	3
Credits	13
Spring	
A ST 311 Statistical Applications	3
CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors	4
BIOL 311 General Microbiology	3
BIOL 313 Structure and Function of Plants	3
Viewing A Wider World ²	3
Credits	16
Third Year	
Fall	
CHEM 2115 Survey of Organic Chemistry and Laboratory	4
EPWS 302 General Entomology	4
SOIL 2110 Introduction to Soil Science	3
PHYS 1230G & PHYS 1230L Algebra-Based Physics I and Algebra-Based Physics I Lab	4
Credits	15
Spring	
EPWS 301 Agricultural Biotechnology	3
EPWS 314 Plant Physiology	3
EPWS 462 Parasitology	3
TOX 361 Basic Toxicology	3
Viewing a Wider World ²	3
Credits	15
Fourth Year	
Fall	
EPWS 310 Plant Pathology	4
EPWS 311 Introduction to Weed Science	4
Elective Course	1
BIOL 312 Plant Taxonomy	3
EPWS 492 Diagnosing Plant Disorders	3
Credits	15
Spring	
AGRO 305 Principles of Genetics	3
AGRO 471 Plant Mineral Nutrition	3
EPWS 447 Seminar	1
EPWS 455 Advanced Integrated Pest Management	3

EPWS 420 Environmental Behavior of Pesticides	3
SOIL 312 Soil Management and Fertility	3
Credits	16
Total Credits	120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

General Agriculture - Bachelor of Science in Agriculture

The general agriculture major is designed for students searching for a well-rounded education that builds on the diversity of the other degree programs in the College of Agricultural, Consumer and Environmental Sciences (ACES). The flexibility of the general agriculture degree allows students to tailor a program to fit their individual interests and career goals. Students completing the program earn a Bachelor of Science in General Agriculture. Students choose general agriculture for a variety of reasons. Some may enter the program with a specific career goal in mind. Others may choose general agriculture to obtain a broader education that will give them more flexibility. The curriculum in General Agriculture is administered by the Department of Entomology, Plant Pathology and Weed Science.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
Select 3-4 credits from the following: ¹		3-4
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1430G	Applications of Calculus I	

MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1511G	Calculus and Analytic Geometry I	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Sciences Course (4 credits) ²		
Area IV: Social/Behavioral Sciences Course (3 credits) ²		
Either an Area III: Laboratory Sciences Course (4 credits) or an Area IV: Social/Behavioral Sciences Course (3 credits) ²		
Area V: Humanities ²		3
Area VI: Creative and Fine Arts ²		3
General Education Elective ²		3-4
Viewing a Wider World ³		
Departmental/College Requirements		
Additional College Requirements ⁴		
Select three areas of concentration from the following ACES departments: ⁵		52
Agricultural Economics and Agricultural Business		
Agricultural and Extension Education		
Animal and Range Science		
Entomology, Plant Pathology and Weed Science		
Family and Consumer Sciences		
Fish, Wildlife and Conservation Ecology		
Plant and Environmental Sciences		
Hotel, Restaurant and Tourism Management		
Second Language: (not required)		
Electives, to bring total credits to 120⁶		33-36
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Some ACES classes will meet general education requirements.

⁵ At least 18 credits must be taken from the primary department and at least 12 credits must be taken from two secondary departments. A minimum of 52 credits (20 of which need to be 300+) of the 120 required for the degree, must be completed in courses offered by the College of Agricultural, Consumer, and Environmental Sciences.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
Area VI: Creative and Fine Arts Course ²		3
Area V: Humanities Course ²		3
Credits		15

Semester 2

ENGL 2210G	Professional & Technical Communication ¹	3
Area III: Laboratory Science Course (recommend one of the following): ²		3-4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology ¹	
HORT 1115G	Introductory Plant Science ¹	
EPWS 1110	Applied Biology ¹	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
Area IV: Social and Behavioral Science Course (recommend one of the following): ²		3
AEEC 2130G	Survey of Food and Agricultural Issues	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Elective Course		3
Primary Concentration Elective Course		3
Credits		15-16

Second Year

Semester 1

ACOM 1130G	Effective Leadership and Communication in Agriculture ¹	3
Area III: Laboratory Science Course (recommend one of the following): ²		3-4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology ¹	
HORT 1115G	Introductory Plant Science ¹	
EPWS 1110	Applied Biology ¹	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
General Education Elective Course ²		3-4
Primary Concentration Elective Course		3
Secondary Concentration Elective Course		3
Credits		15-17
Semester 2		
Primary Concentration Elective Course		3
Primary Concentration Elective Course		3
Secondary Concentration Elective Course		3
VWW: Viewing a Wider World Course ³		3
Upper-Division Elective Course ³		3
Credits		15

Third Year**Semester 1**

Primary Concentration Elective Course	3
Primary Concentration Elective Course	3
VWW: Viewing a Wider World Course ³	3
Elective Course	3
Elective Course	3

Credits **15**

Semester 2

Upper-Division ACES Elective Course	3
Upper-Division ACES Elective Course	3
Secondary Concentration Elective Course	3
Elective Course	3
Elective Course	3

Credits **15**

Fourth Year**Semester 1**

Upper-Division ACES Elective Course	3
Upper-Division ACES Elective Course	3
Upper-Division ACES Elective Course	3
Secondary Concentration Elective Course	3
Elective Course	3

Credits **15**

Semester 2

Upper-Division ACES Elective Course	3
Upper-Division ACES Elective Course	3
Elective Course	3
Elective Course	3
Elective Course	3

Credits **15**

Total Credits **120-123**

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Entomology - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor:		
EPWS 302	General Entomology	4
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 303	Economic Entomology	3
Choose from the following courses:		8
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
EPWS 455	Advanced Integrated Pest Management	
EPWS 462	Parasitology	
Total Credits		18

Pest Management - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor		
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
Choose from the following Courses:		6
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
EPWS 303	Economic Entomology	
EPWS 455	Advanced Integrated Pest Management	
Upper-division EPWS course(s): (3-6 credits)		
Total Credits		18

Plant Pathology - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor:		
EPWS 310	Plant Pathology	4
EPWS 373	Fungal Biology	3
EPWS 486	Plant Virology	3
Choose from the following Courses:		8
BIOL 311	General Microbiology	
BIOL 311 L	General Microbiology Laboratory	
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
EPWS 314	Plant Physiology	
EPWS 455	Advanced Integrated Pest Management	
EPWS 492	Diagnosing Plant Disorders	
Total Credits		18

Weed Science - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor:		
EPWS 311	Introduction to Weed Science	4
EPWS 314	Plant Physiology	3
EPWS 420	Environmental Behavior of Pesticides	3
Choose from the following Courses:		8
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
BIOL 312	Plant Taxonomy	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
EPWS 455	Advanced Integrated Pest Management	
Total Credits		18

Family and Consumer Sciences Undergraduate Program Information

Courses and curricula in the department are designed to educate you as an individual and as a citizen in a changing society. They also develop a scientific attitude and the ability to conduct research directed toward

solutions of problems affecting the quality of life for individuals, families and communities.

You must complete general education requirements, and a sequence of specialized course work is then identified for each major.

The following prefixes are used for courses:

- CTFM - Clothing, Textiles and Fashion Merchandising
- FCSC—Family and Consumer Sciences;
- FCST—Family and Child Science;
- FSTE—Food Science and Technology;
- NUTR— Nutrition

Graduate Program Information

The candidate for the master's degree should have an undergraduate degree in a field related to the intended area of specialization. In addition to the Graduate School requirements, the admissions criteria for the Department of Family and Consumer Sciences Graduate Program include letters of reference, standardized test scores, and other materials. Suggested departmental deadlines for review of admission materials are six weeks prior to the first day of the semester of desired start. A complete description of admission requirements should be obtained from the department.

Degrees for the Department

Bachelor Degree(s)

- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 353)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 355)
- Food Science and Technology (Culinary Science) - Bachelor of Science in Food Science and Technology (p. 357)
- Food Science and Technology (Meat Science) - Bachelor of Science in Food Science and Technology (p. 358)
- Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology (p. 360)
- Human Development & Family Science - Bachelor of Science (p. 362)
- Human Development and Family Science - Bachelor of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/human-development-family-science-bs-online/>)
- Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences (p. 364)
- Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences (p. 366)

Master Degree(s)

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)

Minors for the Department

- Child Advocacy Studies (CAST) - Undergraduate Minor (p. 369)
- Culinary Science - Undergraduate Minor (p. 369)
- Fashion Merchandising & Design - Undergraduate Minor (p. 370)
- Food Science - Undergraduate Minor (p. 370)
- Human Development and Family Science - Undergraduate Minor (p. 370)
- Nutrition - Undergraduate Minor (p. 370)

Merranda Marin, Department Head

Professors Marin, Montañez, Moreno, Delgado

Associate Professors Gomez, Plawecki

Assistant Professors Ahn, Martin, Martinez-Monteagudo, Sabillon Galeas

College Professor Vaillancourt, Coffeen

College Assistant Professors Azcarate, Phillips

I. Ahn, Ph.D. (Chung-Ang University, Korea)- textile and clothing; K. Coffeen, Ph.D. (New Mexico State University)- educational leadership; E. Delgado, Ph.D. (Technical University of Berlin, Germany) – food science and technology; S. Gomez, PhD (University of Illinois-Chicago) - nutritional epidemiology; S. Martin, Ph.D. (South Dakota State University)- nutrition and exercise science; M. Marin, Ph.D. (New Mexico State University) – counseling and educational psychology; M. Montanez, Ph.D. (Michigan State University) – psychology; R. Moreno, Ph.D. (Stanford University) – child development; S. Phillips, M.S. (New Mexico State University) - family and consumer sciences; L. Sabillon Galeas, Ph.D. (University of Nebraska-Lincoln)- food science and technology; K. Vaillancourt, Ph.D. (Virginia Tech University) – family studies

Cooperative Extension Service *L. Banegas-Carreón, M.P.H. (New Mexico State University)- public health; W. Fedio, Ph.D. (University of Alberta-Canada) – food microbiology; N. Flores, Ph.D. (Kansas State University) – food science; B. Jorgensen, Ph.D. (Virginia Tech University) – family studies; S. Koukel, Ph.D. (Texas Tech University) – family and consumer sciences education; K. Martinez, Ph.D. (New Mexico State University)- educational leadership and administration; L. Olivas, M.Ed. (New Mexico State University)- education/curriculum and instruction; K. Plawecki, Ph.D. (University of Illinois)- nutritional sciences; L. Sabillon Galeas, Ph.D. (University of Nebraska-Lincoln)- food science and technology; C. Vanderpool, M.S. (University of New Mexico)- nutrition*

Child Advocacy Studies Courses

CAST 1110. Introduction to Child Advocacy

3 Credits (3)

This is the introductory course for child advocacy studies (CAST). It covers different models for understanding child maltreatment, types and indicators of child maltreatment, controversial topics in the field, and issues and laws related to child maltreatment in various countries around the world. Students will develop critical thinking and analytical skills in assessing child maltreatment. Restricted to Dona Ana campus only.

Learning Outcomes

1. Demonstrate how to apply a model of critical thinking and analysis to child maltreatment issues.
2. Describe historical trends in child maltreatment and child advocacy.
3. Compare and contrast theories and models of child maltreatment.
4. Compare and contrast the indicators and consequences of different types of maltreatment.
5. Discuss cultural issues related to assessing and working with families.

CAST 2110. Professional and Systems Responses to Child Maltreatment 3 Credits (3)

Course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; and current research and controversial issues affecting the field. Restricted to Dona Ana campus only.

Prerequisite(s): CAST 1110.

Learning Outcomes

1. Define neglect, abuse, and violence including psychological, emotional, and spiritual maltreatment.
2. Describe the interpersonal dynamic of violence and abuse, and the varied and changing types of violence and abuse.
3. Identify risk factors for various categories of child abuse in the general population and identify high-risk population.
4. Describe the physical and behavioral health effects of violence, neglect, and abuse, including mental health impacts.
5. Identify the barriers to help-seeking for victimized children.
6. Describe models for intervention and prevention of child maltreatment.
7. Discuss various factors that affect children's motivation for disclosure.
8. Discuss how values, attitudes, beliefs, and experiences related to child maltreatment may effect interaction with children and families
9. Describe best practice in the investigation of maltreatment reports. 1
10. Identify methods utilized to evaluate the credibility of witnesses. 1
11. Describe the processes of collecting corroborative evidence beyond "hard science" items such as DNA. 1
12. Identify strategies for engaging non offending caregivers in providing appropriate support for children who have disclosed maltreatment. 1
13. Identify commonly available community resources that may ensure a safe environment for children disclosing maltreatment. 1
14. Describe strategies for engaging appropriate professionals to ensure children's' well-being following a disclosure of maltreatment. 1
15. Discuss cultural or developmental factors that may impact the well-being of children reporting maltreatment. 1
16. Discuss the scope of confidentiality in child maltreatment cases. 1
17. Describe why all children's safety should be the priority during an investigation. 1
18. Describe the typology of sex offenders in child maltreatment cases. 1
19. Define the grooming process used by sex offenders. 2
20. Discuss circumstances that may cause children to recant the disclosure of child maltreatment. 2
21. Discuss how values, attitudes, beliefs, and experiences related to child maltreatment may effect interaction with children and families. 2
22. Describe legislative and agency mandates of common MDT team members. 2
23. Discuss the scope of authority and resources among MDT members. 2
24. Discuss the importance of maintaining appropriate professional boundaries between team members. 2
25. Identify the kinds of information that must be shared within the MDT team during an investigation or litigation. 2
26. Identify common educational resources needed by MDTs. 2
27. Describe ways to engage community stakeholders in preventing, investigating, and intervening in cases of child maltreatment. 2
28. Accurately describe the steps in the process following a report of child maltreatment. 2
29. Describe common questions asked by children and families during a

**CAST 2120. Prevention, Trauma Informed Treatment and Advocacy
3 Credits (3)**

The purpose of this course is to prepare students to recognize the effects of child maltreatment and apply interventions strategies for children and their families. Multidisciplinary approaches to prevention, advocacy and treatment of child maltreatment survivors will be presented and discussed. Topics include violence prevention research, interdisciplinary family programs, how to advocate for survivors of child abuse, case management, working with families, mental health service and controversial issues.

Prerequisite(s): CAST 1110.

Learning Outcomes

1. Be able to create goals and identify services needed by maltreating families.
2. Understand the development of psychopathology in the child related to maltreatment
3. Understand the documented effects of maltreatment such as depression, anxiety, sexualized behavior, neurobiological, suicide, and damaged ego development/ sense of self
4. Describe interdisciplinary family intervention programs such as in-home parenting programs, Stay Safe program, Incredible Years, Project Safe Care, ECCE, etc.
5. Explain mental health assessment, diagnosis, treatment, and availability of services for the survivor, the family and the offender.
6. Understand PTSD, reactive attachment disorder and other trauma responses; assessment and treatment
7. Describe issues for adolescent and adult survivors of maltreatment such as eating disorders, low self-esteem and personality disorders.
8. Identify professional issues related to maltreatment such as how to approach families and an awareness of the effect of working with families on the professional.
9. Discuss the role of interdisciplinary approaches to child maltreatment intervention in planning for the future and advocating for the rights of children 1
10. Explain violence prevention research, strategies, and programs 1
11. Understand how battering, chemical dependency/maltreatment, mental illness, chronic illnesses, disabilities, and other family stressors influence intervention with survivors, their families and the offender 1
12. Explain how issues of race, class, sexual orientation, religion, gender and social justice can influence professional practice with children who have been maltreated 1
13. Explain the role of the child advocate in addressing social justice issues associated with intervention and prevention of child maltreatment, and in promoting social change that will result in fewer incidents of child maltreatment.

Clothing, Textiles & Fashion Merchandising

CTFM 1110. Fundamentals of Fashion**3 Credits (3)**

Survey of the fashion business from fiber to end product.

Learning Outcomes

1. Describe the roles and functions of industry jobs and sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
2. Describe the business strategies of industry sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
3. Describe the interrelationships among line planning, line development, and line presentation at manufacturing and retail levels.
4. Provide examples of the fashion industry's environmental and social impact.
5. Learn about all career tracks involved in the fashion industry and the global fashion supply chain.
6. Synthesize industry-relevant information on current issues in the fashion industry.

CTFM 2120. Fashion Illustration**3 Credits (1+4P)**

This course explores aspects of fashion illustration, from drawing basic fashion figures to producing finished professional illustrations in color.

This course provides the opportunity for students to integrate their fashion design development with computer-aided systems. The emphasis is on fashion innovation and concept design exploration enhanced by computer applications. May be repeated up to 3 credits.. Prerequisites: ARTS 1145G and CTFM 1110

Learning Outcomes

1. To learn Adobe Illustrator and Adobe Photoshop as drawing and design tools for electronic design and rendering.
2. To understand and utilize the computer as a tool for fashion design.
3. To understand methods of design input, including scanning, digitizing and resizing.
4. To develop customer profiles
5. To Understand Concept Style

CTFM 2130. Concepts in Apparel Construction**3 Credits (1+4P)**

Students are introduced to professional standard sewing techniques and apparel construction. The techniques learned are applied to produce finished garments. Restricted to: FCSE,CTFM majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Define sewing construction terminology, equipment and sewing machine parts.
2. Learn to select suitable patterns and fabrics for garments.
3. Learn to alter commercial patterns for different body types.
4. Identify fabric types, finishes, and labeling.
5. Perform standard operating procedures on sewing machines.
6. Perform clothing construction techniques for various garments.
7. Apply knowledge of industry sewing methods to recognition of garment workmanship.

CTFM 2990. Fashion Practicum**1-3 Credits (1-3)**

Applied field experience in the related areas of apparel design, fashion merchandising, and textile science. May be repeated up to 3 credits.

Restricted to: CTFM majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Gain hands-on knowledge of the fashion industry.
2. Demonstrate the ability to analyze the practices of management, as observed in the industry.
3. Demonstrate an attitude that is appropriate for a prospective manager in the industry.
4. Demonstrate the understanding of, and the ability to use research and problem solving methods to develop, analyze, and present a critical incident analysis.

CTFM 300. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. Restricted to Las Cruces campus only.

Prerequisite(s): CTFM 1110; CTFM 2120.

CTFM 365. Apparel Analysis**3 Credits (3)**

An in-depth investigation of the development, production and comparison of wearing apparel. Focus on the structural, functional and decorative aspects of apparel. Emphasis on sourcing of companies and materials, costing of the product line, comparing design and manufacturing techniques that affect price, quality, and size of apparel. Restricted to: CTFM majors.

Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 366. Historic Fashion**3 Credits (3)**

The study of clothing styles from 3500 BC through the 20th century.

Restricted to: CTFM majors.

Prerequisite(s): CTFM 2120.

CTFM 371. Textile Science**3 Credits (1+4P)**

The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use, and care of textile goods. Restricted to: CTFM majors.

Prerequisite(s): CTFM 1110.

CTFM 372. Fashion Merchandising**3 Credits (3)**

A study of the processes required to bring consumer goods to the marketplace.

Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 373. Advanced Apparel Construction II**3 Credits (1+4P)**

This course builds on Basics of Apparel Construction and explores the application of advanced sewing technology across a range of fashion products. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2130.

CTFM 375. Fashion Buying**3 Credits (3)**

The application of planning, purchasing and controlling inventories using industry data and analytics. Includes merchandising math with an emphasis on product selection and pricing.

Prerequisite(s): ACCT 2110, CTFM 1110, and CTFM 2130.

CTFM 377. Fashion Study Tour**1-3 Credits (1-3)**

Study of international/domestic fashion, designers, manufacturers, merchandisers and/or retailers. May be repeated up to 6 credits. Consent of Instructor required.

CTFM 384. Clothing for Special Needs**3 Credits (3)**

Selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as for active sportswear, the handicapped, the elderly, and various specialty populations.

Prerequisite: consent of instructor.

CTFM 401. Professional Development**1 Credit (1)**

Introduction to the field experience including resume writing, interviewing skills, understanding business ethics and etiquette. Also includes a discussion of career paths and advice from industry guest speakers.

Restricted to: CTFM majors.

Prerequisite(s): CTFM 372 and CTFM 375.

CTFM 402. Field Experience**1-3 Credits (1-3)**

Practical experience in fashion, clothing design, manufacturing, merchandising, or retailing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CTFM majors.

Prerequisite(s): CTFM 401.

CTFM 403. Post-Field Experience**1 Credit (1)**

A case based approach to analyzing internship experiences. Students will share their experiences and prepare case studies about specific business issues they encountered during CTFM 402. Restricted to: CTFM majors.

Prerequisite(s): CTFM 402.

CTFM 460. Cultural Perspectives in Dress**3 Credits (3)**

Explores the social, psychological and cultural aspects of dress and appearance. Consent of Instructor required.

CTFM 473. Flat Pattern for Apparel Design**3 Credits (1+4P)**

Applied design principles to flat patterns techniques including bodies, skirts, sleeves, neckline, and bodies-sleeve combinations. Projects will require three-dimensional approaches in apparel design. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 474. Fashion Promotion**3 Credits (3)**

A comprehensive examination of promotion in the merchandising environment of fashion related goods. Restricted to: CTFM majors.

Prerequisite(s): CTFM 372.

CTFM 476. Draping for Apparel Design**3 Credits (1+4P)**

Development of garment shapes using draping techniques. Emphasis placed on torso development, contouring principles and design development on the form. This course exposes the student to the design process, from initial concept and muslin sample development to final execution of the finished garments. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 477. Capstone in Fashion Merchandising**3 Credits (3)**

Synthesizes previous coursework. Students apply multi-disciplinary principles to the analysis of fashion merchandising case studies and industry related challenges.

Prerequisite(s): CTFM 372, CTFM 375 and CTFM 402.

CTFM 492. Special Problems**1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

CTFM 571. Textile Science**3 Credits (1+4P)**

The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use and care of textile goods. Students will be required to complete additional assignments beyond what is required for CTFM 371.

CTFM 598. Special Research Programs**1-4 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

Family and Child Studies Courses

FCST 1130. Interpersonal Skills in Intimate Relationships**3 Credits (3)**

Developing social skills within friendships, dating relationships, marriage, parenting, and families.

Learning Outcomes

1. To understand several theories that explain why some people have healthy interpersonal relationships while others do not.
2. To gain insight about one's self.
3. To learn and improve upon selected relationship skills that improve quality of life.
4. To learn skills that improve interpersonal relationships

FCST 2110. Infancy Through Middle Childhood in the Family**3 Credits (3)**

This course discusses research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth through age 12. This developmental period will be examined across different cultures and in real world contexts. Attitudes, knowledge, and skills needed for working with young children and their families will be introduced. Restricted to Las Cruces campus only.

Learning Outcomes

1. Evaluate how genes and the environment interact to impact human development from prenatal stages through age twelve.
2. Assess the effects of environmental influences on the developing fetus.
3. Discuss the capacities of newborn development through age twelve.
4. Evaluate how individuals and couples change during the transition to parenthood.
5. Analyze the physical, cognitive, and social-emotional development of the child from birth through age twelve.

FCST 2135. Adolescent Development and the Family**3 Credits (3)**

Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Describe the physical, cognitive, and psychosocial development of the adolescent in the family system and evaluate individual differences in development.
3. Compare and contrast ways in which culture impacts adolescent development.
4. Assess effective parenting strategies with adolescents.
5. Analyze the influence of family, peers, school, and work on adolescent development.

FCST 2140. Adult Development and Aging**3 Credits (3)**

Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare and contrast theories of adult development and aging and apply theories to adult behavior.
2. Distinguish the similarities and differences of physical, emotional, cognitive, and psychosocial aspects of adult development.
3. Describe multicultural factors that impact attitudes toward aging and coping with aging family members.
4. Evaluate ways in which special issues (including but limited to Alzheimer's Disease, heart disease, end of life issues) impact aging.
5. Devise a conceptualization of one's own perspective in dealing with aging and aging family members.

FCST 301. Family Resource Management**3 Credits (3)**

This course provides an understanding of the decision-making process of families concerning the utilization of financial, personal, environmental, and social resources. In particular, the class will focus on how families develop, exchange, and allocate resources throughout the lifespan with the expectation that the most effective resource management decisions are made from positions of knowledge and understanding. May be repeated up to 3 credits.

FCST 302V. Introduction to Child Advocacy**3 Credits (3)**

Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

Learning Outcomes

1. To understand how to apply a model of critical thinking/analysis to child maltreatment issues using a systems framework.
2. Compare and contrast historical trends in child maltreatment and child advocacy.
3. Analyze individual, family and community risk factors for maltreatment.
4. Explain cultural issues related to assessing and working with diverse families.

FCST 380. Family Dynamics**3 Credits (3)**

The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.

FCST 383. Parenting and Child Guidance**3 Credits (3)**

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 401. Community Programs in Family Life**3 Credits (3)**

The purpose of this course is for students to learn through class lectures, readings, and community based activities, about issues related to the formulation, delivery, and evaluation of family life education programs in the local community and through virtual delivery. Students will also learn about conducting needs assessments in the community, and evaluating programs after their implementation in preparation for jobs in the field of Family Science.

Learning Outcomes

1. Identify conceptual frameworks suitable in the development of family life programs.
2. Demonstrate knowledge and understanding of techniques and strategies useful in the delivery of family life education programs.
3. Conduct needs assessments and critiques of existing family life/parent education programs and methods of delivering information to parents and families.
4. Apply evaluation strategies for analyzing program effectiveness.
5. Demonstrate knowledge of the legal, moral, and ethical dimensions of family life education and certification standards.

FCST 424. Field Experience: Issues and Ethics**3 Credits (3)**

Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 6 credits must be taken. Restricted to: FCS majors. Students must be in junior standing to enroll. May be repeated up to 6 credits.

Prerequisite: FCST 380 or equivalent, and an overall GPA of at least 2.5.

Learning Outcomes

1. Upon completion of this course students will be able to integrate learning into applied settings.

FCST 449V. Family Ethnicities and Subcultures**3 Credits (3)**

Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students.

FCST 456. Research Methods**3 Credits (3)**

Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Same as AXED 456.

FCST 492. Special Problems**1-4 Credits**

Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits.

FCST 510. Infancy and Early Childhood in the Family**3 Credits (3)**

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families. May be repeated up to 3 credits.

FCST 511. Middle Childhood Development in the Family**3 Credits (3)**

Research and theory relevant to the physical, mental, and socio-emotional development of children from ages five to twelve. Attitudes, knowledge, and skills needed for working with school-age children and their families. May be repeated up to 3 credits.

FCST 524. Supervised Practicum**1-9 Credits**

Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.

Prerequisite: consent of instructor.

FCST 525. Supervised Clinical Practice**1-9 Credits (2-18P)**

Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

FCST 548. Adult Development and Aging**3 Credits (3)**

Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions. May be repeated up to 3 credits.

FCST 549. Family Ethnicities and Subcultures**3 Credits (3)**

Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCST 449V plus additional work. May be repeated up to 3 credits.

FCST 562. The Business and Practice of Marriage and Family Therapy
1 Credit (1)

This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. Graded: S/U Grading (S/U, Audit).

FCST 572. Family Dysfunction and Diagnosis
3 Credits (3)

A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.

Prerequisite(s): Students must be enrolled in a clinical program (i.e MFT, CEP, MSW).

FCST 582. Theories of Marriage and Family Therapy
3 Credits (3)

A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research.

FCST 583. Parenting and Child Guidance
3 Credits (3)

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 584. Family Law and Ethics
3 Credits (3)

Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

FCST 585. The Family System
3 Credits (3)

Contemporary family interaction: concepts, composition, resource and environment.

FCST 586. Sexuality and Family Dynamics
3 Credits (3)

Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

FCST 587. Contemporary Marriage and Family Issues
3 Credits (3)

Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

FCST 589. Family Crises and Rehabilitation
3 Credits (3)

Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

FCST 590. Special Topics
1-4 Credits

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

FCST 592. Strategies in Family Therapy
3 Credits (3)

Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers.

FCST 598. Special Research Programs
1-4 Credits

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCST 599. Master's Thesis
15 Credits

Thesis

Family and Consumer Science Courses

FCSC 2250. Overview of Family and Consumer Sciences Teaching
3 Credits (3)

Overview of planning and teaching skills. Supervised experiences in observing and directing the learning of secondary family and consumer sciences students. Philosophy and history of the profession.

Learning Outcomes

1. Explain the foci of FCS—past, present and future.
2. Begin to develop a professional role in FCS.
3. Formulate a personal philosophy of FCS, and of teaching.
4. Explain the teaching process.
5. Give examples of roles, responsibilities and qualities of effective and ethical teachers.
6. Assess the characteristics, backgrounds, and needs of learner audiences.
7. Explain various learning theories/principles.
8. Illustrate how various input factors influence teaching decisions.
9. Plan a researched based student-centered lesson with a learning activity in a FCS content area. 1
10. Give examples of ways to evaluate learner growth.1
11. Present a FCS content-based lesson effectively to learners using PowerPoint presentation software and a selected teaching method. 1
12. Evaluate one's own teaching and the teaching of others. 1
13. Exhibit increased confidence in one's abilities as a teacher/educator.1
14. Exhibit excitement about assuming the teacher/educator role.

FCSC 2330. Housing and Interior Design**3 Credits (3)**

Investigation of types of housing and factors impacting housing decisions for families. Selection, planning, and arrangement of interior components of homes to meet the needs of the family. Restricted to Las Cruces campus only.

Learning Outcomes

1. Differentiate between different architectural designs (i.e., Cape Cod, contemporary, craftsman, ranch, southern colonial, Spanish, Victorian, pueblo, New Mexican territorial, and territorial revival) and be able to identify historical, cultural, demographic, geographical, and environmental influences on style and aesthetics.
2. Analyze the fundamentals of housing for all families and cultures and understand the role housing plays in the ecological model of human ecology.
3. Define elements of design as related to housing and interiors (i.e., color, form, line, space texture).
4. Define principles of design as related to housing and interiors (i.e., balance emphasis, harmony, proportion, unity).
5. Compare and contrast the different periods of interior design from the 20th century to the present.
6. Analyze the influence of historical and cultural factors in the development of current interior trends.
7. Select and arrange interiors that are functional and aesthetically pleasing to designated interior design situations.
8. Identify, describe and make application of textiles as related to various furniture and interior design styles.
9. Design a three-dimensional tiny house or an interior space, using all concepts learned.

FCSC 345. Management Concepts in Family and Consumer Sciences Teaching**3 Credits (3)**

Incorporation and application of management concepts in family and consumer sciences subject matter. Practical experience teaching management and ways to use management skills to plan, implement, and evaluate the teaching-learning transaction.

FCSC 348. Teaching in Informal Family and Consumer Sciences Settings**3 Credits (3)**

Learning principles and theories with application in informal family and consumer sciences education situations. Includes supervised experience in use of teaching strategies.

Prerequisite: overall GPA of at least 2.5 or consent of instructor.

FCSC 400. Research Methods in Family and Consumer Sciences**3 Credits (3)**

Introduction to research design and methodology in Family and Consumer Sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and perform basic skills including hypotheses development and conducting a literature search.

FCSC 445. Career and Technical Education Programs**3 Credits (3)**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

FCSC 446. Teaching Methods I for Family and Consumer Sciences**3 Credits (3)**

Methods and strategies for teaching Family & Consumer Sciences content in middle and secondary schools. Organization and development of curriculum. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): FCSC 2250 and FCSC 345 and an overall GPA of 2.75, admitted to FCSE program; completion of NES Essential Basic Skills Tests I, II, & III.

Corequisite(s): FCSC 445.

FCSC 447. Teaching Methods II for Family and Consumer Sciences**3 Credits (3)**

Planning, preparation, and strategies for teaching family and consumer sciences in middle and secondary schools. Preparation for employment. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: FCSE majors.

Prerequisite(s): FCSC 446; overall GPA of 2.75, admitted to program.

FCSC 448. Supervised Teaching in Family and Consumer Sciences**12 Credits (12)**

Seventy (70) days of full-time supervised teaching in selected middle or secondary schools. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: FCSE majors.

Prerequisite(s): FCSC 446, an overall GPA of 2.75, and admitted to FCSE Program.

Corequisite(s): FCSC 447.

FCSC 492. Special Problems**1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

FCSC 500. Research Methods**3 Credits (3)**

This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

FCSC 545. Graduate Study in Vocational Programs for Youth and Adults**3 Credits (3)**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

FCSC 546. Graduate Study in Teaching Methods I**3 Credits (3)**

Objectives, content, and organization of family and consumer sciences in high schools; materials and methods of teaching. Additional assignments beyond FCSC 446 required for students registering in FCSC 546.

FCSC 547. Graduate Study in Teaching Methods II**3 Credits (3)**

Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Additional assignments beyond FCSC 447 required for students registering in FCSC 547.

FCSC 548. Graduate Study in Supervised Teaching in Family and Consumer Sciences**12 Credits (70P)**

Seventy of full-time, supervised teaching in selected schools. Additional assignments beyond FCSC 448 required for students registering in FCSC 548. Consent of Instructor required.

Prerequisite(s): FCSC 446 or FCSC 546, and consent of instructor.

FCSC 590. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

FCSC 598. Special Research Programs**1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCSC 599. Master's Thesis**1-15 Credits**

May be repeated for unlimited credit, maximum of 6 credits toward a degree.

Food Science and Technology Courses

FSTE 1120. ACES in the Hole Foods I**4 Credits (4)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products Restricted to Las Cruces campus only. Students enrolled in this class must possess A Food Handler Card

Learning Outcomes

1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2110G. Food Science I**4 Credits (3+2P)**

The scientific study of the principles involved in the preparation and evaluation of foods. May be repeated up to 4 credits.

Learning Outcomes

1. Explain basic scientific principles involved in the preparation of high quality food products.
2. Utilize scientific inquiry in the experimental investigation of factors influencing the chemical, physical and sensory properties of food products.
3. Apply basic scientific principles, procedures, techniques and standards in the preparation of all types of high quality food products.
4. Use basic methods of quantitative analysis to critically evaluate quality characteristics of food.
5. Use sensory science techniques and terminology to critically evaluate acceptability and quality characteristics of food.
6. Describe high quality characteristics of a variety of food products using appropriate terminology.
7. Apply principles of sanitation and safety to food preparation.

FSTE 2120. ACES in the Hole Foods II**4 Credits (8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. Student must also have a Food Handler Card to enroll in this course.

Prerequisite(s): FSTE 1120.

Learning Outcomes

1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2130G. Survey of Food and Agricultural Issues**3 Credits (3)**

Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with AEEC 2130G.

Learning Outcomes

1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulate modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

FSTE 2996. Special Topics**1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

FSTE 320. Food Microbiology**4 Credits (3+2P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. May be repeated up to 4 credits. **Prerequisite(s):** (BIOL 2610G and BIOL 2610L), or (BIOL 2110G and BIOL 2110L)

FSTE 325. Food Analysis**3 Credits (2+2P)**

Basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. May be repeated up to 3 credits.

Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 331. Food Preservation**3 Credits (2+2P)**

Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. May be repeated up to 3 credits.

Prerequisite(s): FSTE 2110G.

FSTE 340. Cereal Technology**3 Credits (2+2P)**

This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.

Learning Outcomes

1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 350. Dairy Technology**3 Credits (2+2P)**

This course provides general knowledge on dairy technology as well as on various processing technologies regarding the science behind a variety of dairy products. It is designed to give a thorough understanding of the composition and properties of milk, and of the physical and chemical changes occurring in milk during processing and storage. These products include fluid milk, fermented dairy products, concentrated and dried dairy products, butter, cream and various frozen dairy desserts. Principles and practices in assembling, receiving, processing, and packaging milk and dairy products, including beverage, frozen, cream, butter, concentrated and fractionated milks, dried milks, casein, and lactose.

Prerequisite: FSTE 2110G.

Learning Outcomes

1. To gain an understanding of dairy processing technologies, unit operation and production of dairy products and ingredients.
2. To understand the principles of processing of dairy products by integrating the concepts of chemistry, biochemistry, microbiology, nutrition, sensory properties, and engineering relevant to dairy processing operations.
3. To gain an ability to think critically on practical problems that occur in the dairy industry and to appreciate the many challenges in dairy research technology and dairy product development.
4. To engage in group discussion on current issues pertinent to culture dairy industry.

FSTE 375. Professional Development in Food Science**1 Credit (1)**

Covers essential elements of career management including preparation for a successful internship. Students must have a Food Handler Card.

Restricted to: FSTE majors. Graded S/U.

Prerequisite: FSTE 2120.

Learning Outcomes

1. Describe their Jung Type.
2. Articulate their personal mission.
3. Identify their personal strengths and weaknesses.
4. Establish short and long term career goals.
5. Prepare an effective cover letter.
6. Develop a professional resume.
7. Understand the dos and don'ts of interviewing.
8. Properly dress for interviewing.
9. Understand the factors to consider when deciding what job offer to accept. 1
10. Understand the objectives and requirements of the Food Science internship program.

FSTE 421. Food Chemistry**3 Credits (3)**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing, and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods.

Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 423. Food Processing Technologies**4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting.

Prerequisite(s): FSTE 328.

FSTE 425. Sensory Evaluation of Foods and Product Development**3 Credits (2+2P)**

Application of affective sensory tests, chemical, physical, and experimental methods to the development and evaluation of a food product. Sensory test methods and procedures used to evaluate the flavor, color and texture of foods. Relationships between sensory and instrumental measurements quality parameters. The course will present the parametric and non-parametric tests that are used in sensory evaluation. May be repeated up to 3 credits.

Prerequisite: FSTE 2110G and (A ST 311 or MATH 1350G).

Learning Outcomes

1. Describe the chemical senses and the receptors that mediate the basic taste modalities.
2. Match sensory tests to research questions and to use the suitable statistical tests.
3. Design and develop a food product and conduct a basic research project.
4. Communicate research results using written, oral, and visual communication techniques.

FSTE 430. Brewing Science & Engineering**3 Credits (3)**

Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll. Crosslisted with: CHME 495.

Learning Outcomes

1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

FSTE 450. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

FSTE 475. ACES Foods at NMSU-Experiential Learning**1 Credit (2-8P)**

Professional work experience for FSTE majors only.

Prerequisite: FSTE 375.

Learning Outcomes

1. Students will collect a minimum of four hundred hours.

FSTE 476. FSTE Internship Seminar**1 Credit (1)**

A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they countered during FSTE 475 (Internship) and analyze them. Restricted to Food Science Technology majors.

Prerequisite: FSTE 475.

Learning Outcomes

1. Analyze business practices as experienced during an internship.
2. Deliver a presentation effectively communicating operations of ACES Foods at NMSU.
3. Assess use of state and federal food regulation agencies within ACES Foods at NMSU.
4. Present in written form the history, business operations, job descriptions, organizational structure, and human resource policies of ACES Foods at NMSU.

FSTE 480. Food Safety**3 Credits (3)**

Provide students' knowledge on good manufacturing practices and prerequisite programs, conduct hazard analysis and determine preventive controls, define process, food allergen, sanitation and supply-chain preventive controls and discuss verification validation, recall and recordkeeping requirements with training and educational opportunities related to current best practices and guidance, and future regulatory requirements by establishing the Produce Safety Alliance. Students participate in a Mock Audit. Participants will receive an official FSPCA Preventive Controls Qualified Individual certificate issues by AFDO after attending this training program.

Prerequisite(s): FSTE 320 or BIOL 311, or consent of instructor.

FSTE 490. Processed Meats**3 Credits (2+2P)**

This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic involvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.

Learning Outcomes

1. The theory and chemistry of meat processing.
2. Processing techniques and basic formulations of different categories of processed meats.
3. The effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. To evaluate products for consumer and analytical quality and composition.
5. To evaluate and assess defective products and propose processing/ingredient solutions.

FSTE 492. Special Problems**1-4 Credits**

Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

FSTE 500. Data Analysis for Food Scientists**3 Credits (3)**

An introduction to data analysis of food scientists. Modern statistical techniques used to analyze typical data collected by food scientists and researchers will be covered. Consent of instructor required.

FSTE 520. Graduate Study in Food Microbiology**3 Credits (2+3P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.

Prerequisites: BIOL 2610G/2610L, or BIOL 2110G/2110L, or consent of instructor.

FSTE 521. Graduate Study in Food Chemistry**3 Credits (3)**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.

Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 523. Food Processing Technologies**4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting. Additional work beyond that for FSTE 423 required at the graduate level.

Prerequisite(s): FSTE 528.

FSTE 524. Sensory Evaluation of Foods**3 Credits (2+3P)**

Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.

Prerequisite(s): FSTE 2110G and A ST 311 or MATH 1350G.

FSTE 525. Graduate Study in Food Analysis**3 Credits (2+3P)**

Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.

Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 531. Food Preservation**3 Credits (3)**

Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. Same as FSTE 331 with additional work required at the graduate level.

FSTE 532. Designing and Brewing Great Beers of the World**3 Credits (2+2P)**

The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweizen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

FSTE 540. Cereal Technology**3 Credits (2+2P)**

This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.

Learning Outcomes

1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 560. Rumen Microbiology (so)**3 Credits (3)**

Same as ANSC 560.

FSTE 598. Special Research Programs**1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

FSTE 600. Special Research Program**1-6 Credits (1-6)**

Special research for doctoral students May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

FSTE 601. Cooperative Extension Service Field Experience**1-3 Credits (1-3)**

This course will provide students with knowledge and experience in community outreach through the cooperative extension service. This course is required for students pursuing a Ph.D. in FSHN. Students will work collaboratively with extension faculty on applied projects. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: FSHN majors.

FSTE 605. Doctoral Seminar**1 Credit (1)**

Current topics and research in Food Science and Human Nutrition. Course will include experts from the field as guest speakers. Students will have the opportunity to present their doctoral proposals and/or research findings.

FSTE 698. Doctoral Reserach**1-6 Credits (1-6)**

Research May be repeated up to 6 credits. Consent of Instructor required.

FSTE 700. Doctoral Dissertation**1-12 Credits (1-12)**

Dissertation May be repeated up to 18 credits. Consent of Instructor required.

Prerequisite(s): Passed the qualifying exam and comprehensive exam.

Nutrition Courses

NUTR 2110. Human Nutrition**3 Credits (3)**

This course provides an overview of nutrients, including requirements, digestion, absorption, transport, function in the body and food sources. Dietary guidelines intended to promote long-term health are stressed.

Learning Outcomes

1. Evaluate sources of nutrition information for reliability
2. Identify elements of a nutritious diet
3. Describe the digestion, transport, and absorption of nutrients
4. Describe the importance of nutrition in weight control and health
5. Identify nutritional needs as they relate to the life cycle and performance
6. Describe behavior modification techniques that promote good health
7. Evaluate popular nutrition trends for scientific accuracy and effectiveness
8. Develop skills in the planning and assessing of healthy meal plans
9. Describe the role of food choices in the development of chronic disease 1
10. Describe the role of food in the promotion of a healthful lifestyle

NUTR 2120. Seminar I - Becoming a Nutrition Professional**1 Credit (1)**

This course will introduce students to the field experience, careers, and professions in nutrition. This course is required for students pursuing a Didactic Program in Dietetics verification statement. May be repeated up to 1 credits. Consent of Instructor required. Restricted to: HNDS majors.

Learning Outcomes

1. Describe career options within the fields of Nutrition Dietetics.
2. Outline the HNDS field experience process.
3. Explain the educational pathways in HNDS.
4. List requirements for admission into the HNDS Dietetics pathway.
5. Begin an HNDS student portfolio.
6. Discuss the importance of personal responsibility accountability

NUTR 3110. Nutrition Throughout the Lifecycle**3 Credits (3)**

Relationship of the stages of the human life cycle to changes in nutrient need. Consent of Instructor required.

Prerequisite(s): NUTR 2110.

Learning Outcomes

1. Understand the value of collaborative work in nutrition care of individuals.
2. Compare and contrast the physiological, behavioral, and psychosocial factors associated with each life stage that affect nutritional status.
3. For each life cycle stage, create a nutritionally adequate menu that meets key nutrient needs.
4. Culturally appropriate evidence-based interventions to address common nutrition-related conditions experienced in each lifecycle stage.
5. Utilize the Nutrition Care Process to complete a nutrition assessment.

NUTR 3120. Food for Health**4 Credits (4)**

This course is designed to provide students the opportunity to learn about the intersection of nutrition and health in terms of food and diet. Students will be introduced to basic concepts within nutrition education, nutrition communication, nutrition and health and food culture. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): NUTR 3110. **Prerequisite(s):** NUTR 2110, FSTE 2110G, HRTM 2120.

Learning Outcomes

1. Complete nutritional analysis of a recipe/meal.
2. Modify traditional recipes to improve nutritional value and/or meet standards of a therapeutic diet.
3. Explain cultural and religious considerations when planning menus for diverse groups.
4. Critically evaluate and modify recipes to meet the needs of various ethnic, religious, and special populations.
5. Develop and conduct a hands-on nutrition education for a target group to teach healthy eating skills.

NUTR 3710. Food Systems & Policy in Dietetics**3 Credits (3)**

This course introduces students to food and nutrition policy issues, institutions, and stakeholders and their impacts on public health, sustainability, and the practice of dietetics in the US. The course will examine policy development and the roles of federal agencies, private firms, non-governmental organizations, and the media in food and nutrition policy. It will also examine international perspectives on food and nutrition policies and programs used to support global nutrition, health promotion, and wellness.

Prerequisite(s): Junior standing, NUTR 3110, NUTR 3120.

Learning Outcomes

1. Discuss the economic, political, social, and cultural factors that influence US food and nutrition policies and impact national food systems and population health.
2. Identify the psychological, social, cultural, and environmental factors that influence food choices, eating behaviors, and nutrition-related practices.
3. Describe the processes and major players involved in US food and nutrition policy development, implementation, monitoring/evaluation, and regulation.
4. Recognize the influence of food and nutrition policy on the practice of dietetics.

NUTR 3750. Applied Nutrition Research**3 Credits (3)**

This course will introduce students to various types of nutrition research and equip them to locate and critique nutrition and dietetics research articles. Research analysis skills will then be applied to a review of the current literature on a nutrition topic and applied to dietetics practice. May be repeated up to 3 credits.

Prerequisite: MATH 1350G (OR A ST 311); NUTR 3110.

Learning Outcomes

1. Recall the various research methods, study designs, and statistical analyses used in nutrition research.
2. Compare and contrast research methods and analyses in nutrition research.
3. Analyze nutrition research for appropriateness of the methods and analyses.
4. Evaluate nutrition research to form sound, ethical conclusions and practice recommendations.

NUTR 3996. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): Junior or Senior standing, consent of instructor.

Learning Outcomes

1. Develop foundational knowledge in a specialized area of dietetics practice.

NUTR 4110. Advanced Nutrition**3 Credits (3)**

Application of biochemistry and physiology to nutrition. May be repeated up to 3 credits. Prerequisite(s): BIOL 2221, (OR A ST 311); NUTR 3110

Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercising or fasting.

NUTR 4205. Nutrition Communication and Education**3 Credits (3)**

In this course, HNDS students learn about the foundation, design, and delivery of nutrition communication and nutrition education. Students will learn ways to develop audience-focused communication and learning assessment. This course will cover the communication methods used in all facets of the nutrition and dietetics field including oral presentations, writing, video, food photography, and food demonstrations. Students will utilize a large variety of channels to communicate and educate different target audiences.

Prerequisite: NUTR 3110.

Learning Outcomes

1. Identify a minimum of four reliable sources of nutrition information.
2. Interpret and clearly communicate evidence-based nutrition information.
3. Evaluate the application of behavior change theories and models to nutrition communications.
4. Adapt nutrition communication and education to target specific cultural and age groups.
5. Develop a nutrition education lesson plan with SMART learning objectives, learning activities, and learning assessments.

NUTR 4207. Nutrition Services**3 Credits (3)**

In this course, HNDS Dietetic students will learn about the promotion and payment of nutrition services along with aspects related to reimbursement and partnering with allied professionals. The HNDS Dietetics students will also engage in clinical and community nutrition field experiences. This course will provide HNDS Dietetic students with the opportunity to assess their knowledge of professional competencies within the field of dietetics. Restricted to students with senior standing within the Dietetics Option of the HNDS major.

Learning Outcomes

1. Compare best practice guidelines to actual practice in the provision of nutrition services within community settings.
2. Explain at least two processes in delivering quality food and nutrition services.
3. Identify private and public healthcare funding sources.
4. Explain Medicare, Medicaid, and private payer coverage for medical nutrition therapy.
5. Discuss referrals, primary care partnership and promoting nutrition services.
6. Describe best practices, resources and guidelines related to the reimbursement for nutrition services.
7. Compare best practice guidelines to actual practice in the provision of nutrition services within clinical nutrition settings.
8. Evaluate the content of the Commission on Dietetic Registration RDN credentialing exam.

NUTR 4210. Community Nutrition**3 Credits (3)**

Overview of the practice of community nutrition. Includes program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Same as NUTR 5210.

Prerequisite: NUTR 3110, NUTR 3710.

Learning Outcomes

1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 4220. Food Service Organization and Management**3 Credits (3)**

Personnel, financial and general management in institutional and commercial food service operations.

Prerequisite: HRTM 2120.

Learning Outcomes

1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and scenarios.
4. Evaluate a nutrition and foodservice budget and interpret financial data.

NUTR 4230. Medical Nutrition Therapy I**3 Credits (3)**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics.

Prerequisite: NUTR 4110, BCHE 341.

Corequisite: NUTR 4230; NUTR 4233.

Learning Outcomes

1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 4230L. Medical Nutrition Therapy I Lab**1 Credit (1P)**

Supplements NUTR 4230. Students will perform nutrition assessments, nutrition focused physical exams, apply medical nutrition therapy-based interventions and practice patient discharge education for specific disease states. Elements of pathology and biochemistry of nutrition-related conditions are integrated into course topics. Restricted to: HNDS majors.

Corequisite(s): HNDS 4230.

Learning Outcomes**NUTR 4233. Nutrition Counseling and Education****3 Credits (3)**

This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education.

Prerequisite: NUTR 3110; FCSC 348.

Learning Outcomes

1. Evaluate nutrition counseling strategies tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.
5. Develop and present a nutrition education lesson based on current nutrition research.

NUTR 4235. Entering the Field of Dietetics**1 Credit (1)**

Students will develop professional materials that will be used in their future careers including a personal statement, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered. Restricted to: HNDS majors. Students must be a Senior to enroll.

Prerequisite/Corequisite: NUTR 4210.

Learning Outcomes

1. Students will develop professional materials that will be used in their future careers including a personal statement, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered

NUTR 4240. Medical Nutrition Therapy II**3 Credits (3)**

Continuation of NUTR 4230.

Prerequisite: NUTR 4230.

Corequisite: NUTR 4240L.

Learning Outcomes

1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process Model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 4240L. Medical Nutrition Therapy II Laboratory**1 Credit (1P)**

Supplements NUTR 4240. Students will apply medical nutrition therapy to specific disease states with special emphasis on writing nutrition support orders and learning to utilize nutrition support equipment. Students will learn and apply advanced nutritional therapies and patient management strategies. Restricted to: HNDS majors.

Corequisite(s): HNDS 4240.

Learning Outcomes

1. Calculate nutrition support recommendations and document orders in the patient's medical chart.
2. Demonstrate safe use of nutritional support equipment.
3. Master use of the Nutrition Care Process in case-based and simulated patient scenarios to conduct nutrition assessments and implement evidence-based interventions.
4. Critically evaluate lab values and client anthropometric data.
5. Select therapeutic diets for the treatment of medical conditions and their symptoms.

NUTR 4565. Field Experience Community Nutrition**1-8 Credits (1-8)**

Experience working with nutritional problems of individual families of all socioeconomic and age levels and with agencies concerned with community nutrition. Practical experience with supervision by resident faculty as well as supervisor at the work site. Performance at work site graded in accordance with university standards. May be repeated up to 8 credits. Consent of Instructor required.

Prerequisite(s): Senior standing, NUTR 4210, consent of instructor.

Learning Outcomes

1. Apply dietetics knowledge to practice in various community settings.
2. Develop a field experience portfolio highlighting the development of community nutrition knowledge and skills.
3. Compare and contrast the responsibilities of Registered Dietitians in various community practice organizations.

NUTR 4991. Special Problems**1-4 Credits (1-4)**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits. May be repeated up to 8 credits. Consent of Instructor required.

Prerequisite(s): Junior or Senior standing.

Learning Outcomes

1. Develop specialized knowledge and competencies in a selected nutrition and dietetics subject area.

NUTR 5110. Graduate Studies in Advanced Nutrition**3 Credits (3)**

Covers biochemistry and physiology applied to nutrition. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. Crosslisted with: NUTR 4110.

Prerequisite(s)/Corequisite(s): NUTR 3110. Student must be classified as a Graduate student to enroll in this course, BIOL 2221, BCHE 341, and NUTR 2110, or consent of instructor.

Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercise or fasting.

NUTR 5150. Orientation to Dietetic Internship**3 Credits (3)**

Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. Assembly of dietetic intern portfolio that will be kept throughout dietetic internship.
2. Readiness to begin supervised practice rotations.
3. Understanding of steps and processes to successfully complete requirements of dietetic internship and Masters of Science in Family Consumer Sciences.
4. Upon completion of the course, students will be able to understand the importance of evidence-based information, research ethics, the Code of Ethics of the Profession of Dietetics, and the basic structure of an IRB proposal.

NUTR 5210. Graduate Study in Community Nutrition**3 Credits (3)**

Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. May be repeated up to 3 credits. Crosslisted with: NUTR 4210.

Prerequisite(s): Graduate student, NUTR 3110, NUTR 3710, NUTR 3750, or consent of the instructor.

Learning Outcomes

1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state-level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data, and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 5220. Graduate Studies in Food Service Organization and Management**3 Credits (3)**

Personnel, financial and general management in institutional and commercial food service operations. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4220. May be repeated up to 3 credits.

Prerequisite(s): Graduate Students; HRTM 2120, NUTR 3120, or consent of instructor.

Learning Outcomes

1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing, and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and management practices of a specific food service establishment.
4. Apply management theories and principles to quality assurance and human resource case scenarios.
5. Evaluate a nutrition and food service budget and interpret financial data.

NUTR 5230. Graduate Studies in Medical Nutrition I**3 Credits (3)**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond NUTR 4230 required. May be repeated up to 3 credits. Crosslisted with: NUTR 4230.

Prerequisite(s): Graduate student, NUTR 3110, NUTR 4110, BIOL 2225 or BIOL 2221, or consent of instructor.

Learning Outcomes

1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 5233. Graduate Studies in Nutrition Counseling & Education**3 Credits (3)**

This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education. Additional assignments beyond NUTR 4233 required. May be repeated up to 3 credits. Crosslisted with: HNDS 4233.

Prerequisite(s)/Corequisite(s): NUTR 5230. Students must be classified as a Graduate student to enroll in this course, NUTR 2110, NUTR 3110, FCSC 348.

Learning Outcomes

1. Evaluate nutrition counseling strategies and tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.
5. Develop and present a nutrition education lesson based on current nutrition research.

NUTR 5240. Graduate Studies in Medical Nutrition Therapy II**3 Credits (3)**

Continuation of HNDS 546. May be repeated up to 3 credits. Crosslisted with: NUTR 4240.

Prerequisite(s): Graduate student, NUTR 5230 and NUTR 4230L or consent of instructor.

Learning Outcomes

1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 5610. Dietetic Intern Seminar**1 Credit (1)**

Portfolio development for dietetic interns during supervised practice rotations. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.
3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 6: Incorporate critical-thinking skills in overall practice.
9. CRDN
10. 1: Practice in compliance with current federal regulations and state statutes and rules, as applicable and in accordance with accreditation standards and the Scope of Nutrition and Dietetics Practice and Code of Ethics for the Profession of Nutrition and Dietetics.
11. CRDN
12. 2: Demonstrate professional writing skills in preparing professional communications.

NUTR 5620. Dietetic Internship: Supervised Practice in Community Nutrition**1-8 Credits (2-6P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in community nutrition to include an emphasis in Cooperative Extension Service. Dietetic interns work under the the guidance of faculty and community nutrition professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Evaluate the operation of Cooperative Extension Service nutrition programs in the areas of policies and procedures. 1
19. CES
20. Develop and deliver nutrition presentations to client/consumer audiences on various topics related to client/consumer needs. 1
21. CES
22. Ensure cultural relevancy and appropriateness of nutrition education. 1
23. CES
24. Assess educational needs and provide nutrition counseling based on individual needs, knowledge, medical needs, and socioeconomic status.

NUTR 5630. Community Nutrition for Dietetic Interns**3 Credits (3)**

Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Ensure cultural relevancy and appropriateness of nutrition education.

NUTR 5640. DI SUP PRACT FS MGT**1-5 Credits (2-10P)**

Provides dietetic interns with a minimum of 300 clock hours of supervised practice in foodservice management. Dietetic interns work under the guidance of faculty and foodservice management professionals. Students must complete a total of 4 credit hours of NUTR 5640. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

NUTR 5650. Foodservice Management for Dietetic Interns**3 Credits (3)**

Advanced topics in foodservice systems management to include business planning and marketing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 2: Demonstrate professional writing skills in preparing professional communications.
3. CRDN
4. 15: Practice and/or role play mentoring and precepting others.
5. CRDN
6. 4: Design, implement and evaluate presentations to target audiences.
7. CRDN
8. 3: Demonstrate active participation, teamwork and contributions in group setting.
9. CRDN
10. 7: Apply leadership skills to achieve desired outcomes.
11. CRDN
12. 8: Demonstrate negotiation skills.
13. CRDN
14. 4: Apply current informatics technology to develop, store, retrieve and disseminate information and data.
15. CRDN
16. 6: Analyze quality, financial and productivity data for use in planning.
17. CRDN
18. 7: Conduct feasibility studies for products, programs, or services with consideration of costs and benefits.
19. CRDN
20. 8: Develop a plan to provide or develop a product, program, or service that includes a budget, staffing needs, equipment and supplies.

NUTR 5660. Dietetic Internship: Supervised Practice in Clinical Dietetics 1-8 Credits (2-16P)

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 4 Function as a member of interprofessional teams.
5. CRDN
6. 11 Show cultural competence/sensitivity in interactions with clients, colleagues and staff.
7. CRDN
8. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
9. CRDN
10. 2 Conduct nutrition focused physical exams.
11. CRDN
12. 3 Demonstrate effective communication skills for clinical and customer services in a variety of formats

NUTR 5670. Nutrition Care Process for Dietetic Interns 3 Credits (3)

Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of Instructor required.

Prerequisite(s): Acceptance into Dietetic Internship. Restricted to: HNDS majors.

Learning Outcomes

1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.
3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and diet.
7. CRDN
8. 4 Evaluate emerging research for application in dietetics practice.
9. CRDN
10. 2 Demonstrate professional writing skills in preparing professional communication. Perform the nutrition care process and use standardized nutrition language for individuals, groups, and populations of differing ages and health status, in a variety of settings.
11. CRND
12. 2 Conduct nutrition focused physical exams.

NUTR 5680. Review Course for National RD Exam 3 Credits (3)

Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: exclude HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. Demonstrate readiness to take the National Registration Examination for Dietitians.
2. Completion of all requirements of the NMSU Dietetic Internship.
3. Completion of all requirements to receive a Master of Science in Family Consumer Sciences from New Mexico State University

NUTR 5991. Special Research Programs 1-4 Credits (1-4)

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree. May be repeated up to 6 credits.

Prerequisite(s): Graduate Student.

Learning Outcomes

1. Develop analytical or experimental research skills in the areas of human nutrition and dietetics.

NUTR 5996. Special Topics 1-4 Credits (1-4)

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): Graduate student.

Learning Outcomes

1. Evaluate issues surrounding advanced nutrition and dietetics topics.

Phone: (575) 646-3936

Website: <http://aces.nmsu.edu/academics/FCS/>

Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences

This major prepares you to teach in middle or high school or in other settings such as the Cooperative Extension Service or community agencies. The major is an accredited education program which meets the teacher licensure requirements for the State of New Mexico. In the spring semester of the senior year, you will apply all the principles of teaching that you have learned in a semester of student teaching in a selected school. Requirements for admission to the student teaching component of the Family and Consumer Sciences Education are

1. an overall grade-point average of 2.75 or higher, and a grade-point average of 2.75 or higher in family and consumer sciences courses;
2. evidence of passing NES Essential Academic Tests I, II, III;
3. a C or better in all departmental courses; and
4. recommendation of the advisor.

You must have passed the NES Essential Academic Tests I, II, III and you must have a GPA of 2.75 or higher before enrolling in the following FCSE courses:

Prefix	Title	Credits
FCSC 446	Teaching Methods I for Family and Consumer Sciences	3
FCSC 447	Teaching Methods II for Family and Consumer Sciences	3
FCSC 448	Supervised Teaching in Family and Consumer Sciences	12

Requirements

A list of specific requirements is available in the department. Please check with your advisor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science	3
or ENGL 2210G	Professional & Technical Communication	
Oral Communication:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area II: Mathematics		
MATH 1130G	Survey of Mathematics ¹	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Area V: Humanities		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		
ARTH 1115G	Orientation in Art	3
or ARTS 1145G	Visual Concepts	
General Education Elective		
PSYC 1110G	Introduction to Psychology	3
Viewing a Wider World		
PHLS 3110V	Human Sexuality	3
One approved VWW course (see advisor) ²		3
Departmental Requirements		
CTFM 1110	Fundamentals of Fashion	3
CTFM 2130	Concepts in Apparel Construction	3
CTFM 371	Textile Science	3
FCST 2135	Adolescent Development and the Family	3
FCST 301	Family Resource Management	3

FCST 380	Family Dynamics	3
FCST 383	Parenting and Child Guidance	3
FCSC 2330	Housing and Interior Design	3
FCSC 2250	Overview of Family and Consumer Sciences Teaching	3
FCSC 345	Management Concepts in Family and Consumer Sciences Teaching	3
FCSC 445	Career and Technical Education Programs (for Youths and Adults)	3
FCSC 446	Teaching Methods I for Family and Consumer Sciences	3
FCSC 447	Teaching Methods II for Family and Consumer Sciences	3
FSTE 2110G	Food Science I	4
NUTR 2110	Human Nutrition	3
FSTE food science 300+ elective (see advisor for selections)		3
NUTR nutrition 300+ elective (see advisor for selections)		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
HRTM 1130	Introduction to Hospitality Management	3
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
HRTM 363	Quantity Food Production and Service	4
Specific Teaching Requirements		
FCSC 448	Supervised Teaching in Family and Consumer Sciences (Specific Teaching Requirements)	12
SPED 3105	Introduction to Special Education in a Diverse Society	3
READ 4330	Content Area Literacy	3
Second Lanuage: (not required)		
Electives, to bring the total credits to 120		0
Total Credits		120

¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ARTH 1115G	Orientation in Art	3
or ARTS 1145G	or Visual Concepts	
ENGL 1110G	Composition I	4
or ENGL 1110H	or Composition I	
MATH 1130G	Survey of Mathematics	3
PSYC 1110G	Introduction to Psychology	3
CTFM 1110	Fundamentals of Fashion (C or better)	3
Credits		16

Spring			VWW - Viewing a Wider World Course ¹			3
ENGL 2221G	Writing in the Humanities and Social Science	3	Credits			15
or ENGL 2210G	or Professional & Technical Communication		Spring			
BIOL 1120G	Human Biology	4	FCSC 447	Teaching Methods II for Family and Consumer Sciences (C or better) ^{2,3}		3
& BIOL 1120L	and Human Biology Laboratory		FCSC 448	Supervised Teaching in Family and Consumer Sciences (C or better) ^{2,3}		12
FCST 2135	Adolescent Development and the Family (C or better)	3	Credits			15
Choose one from the following:		3	Total Credits			120
ECON 1110G	Survey of Economics					
ECON 2110G	Macroeconomic Principles					
ECON 2120G	Principles of Microeconomics					
Credits		13				
Second Year						
Fall						
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4				
HRTM 1130	Introduction to Hospitality Management	3				
FCSC 2250	Overview of Family and Consumer Sciences Teaching (C or better)	3				
ACOM 1130G	Effective Leadership and Communication in Agriculture	3				
NUTR 2110	Human Nutrition (C or better)	3				
Credits		16				
Spring						
FCSC 2330	Housing and Interior Design (C or better)	3				
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1				
CTFM 2130	Concepts in Apparel Construction (C or better)	3				
FCST 383	Parenting and Child Guidance (C or better)	3				
FSTE 2110G	Food Science I (C or better)	4				
Credits		14				
Third Year						
Fall						
VWW - Viewing A Wider Course ¹		3				
CTFM 371	Textile Science (C or better)	3				
NUTR Upper Division Elective Course (C or better)		3				
FCST 301	Family Resource Management (C or better)	3				
HIST 1110G	United States History I	3				
or HIST 1120G	or United States History II					
Credits		15				
Spring						
FCSC 345	Management Concepts in Family and Consumer Sciences Teaching (C or better)	3				
HRTM 363	Quantity Food Production and Service	4				
SPED 3105	Introduction to Special Education in a Diverse Society	3				
FSTE Upper Division Elective Course (C or better)		3				
HRTM 2120	Food Production and Service Fundamentals	3				
Credits		16				
Fourth Year						
Fall						
FCST 380	Family Dynamics (C or better)	3				
FCSC 445	Career and Technical Education Programs (C or better) ²	3				
FCSC 446	Teaching Methods I for Family and Consumer Sciences (C or better) ^{2,3}	3				
READ 4330	Content Area Literacy ²	3				

VWW - Viewing a Wider World Course ¹ 3

Credits 15

Spring

FCSC 447 Teaching Methods II for Family and Consumer Sciences (C or better) ^{2,3} 3

FCSC 448 Supervised Teaching in Family and Consumer Sciences (C or better) ^{2,3} 12

Credits 15

Total Credits 120

¹ Approved VWW courses are: PHLS 3110V Human Sexuality, BLAW 385V Employment and Consumer Law and MKTG 311V Consumer Behavior

² Before being admitted to the program and enrolling in 400-level classes, students must pass the National Evaluation Series for Certification: Essential Academic Skills, Subtests I, II, and III.

³ Students must have a 2.75 GPA or higher in order to register for these courses.

Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences

The Fashion Merchandising and Design major prepares students to achieve career goals in the diverse areas of the fashion industry. Students are prepared with well-rounded coursework related to the creative, technical and business aspects of the industry. The program develops the business knowledge, design fundamentals and industry experience needed to compete in today's fashion industry. The required coursework includes completion of a minor in Marketing as well as gaining valuable hands-on field-experience. A GPA of 2.5 or better is required to enroll in CTFM 402 Field Experience to complete the degree requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	

COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		3
MATH 1350G	Introduction to Statistics ²	
Area III/IV: Laboratory Sciences and Social/ Behavioral Sciences		10
Area III: Laboratory Science Course (4 credits) ¹		
Area IV: Social/Behavioral Science Course (3 credits) ¹		
<i>Choose one from the following (3 credits):</i>		
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts		3
ARTS 1145G	Visual Concepts	
General Education Elective ¹		3-4
Any "G" course, excluding Area I and crosslisted courses		
Viewing A Wider World ³		
MKTG 311V	Consumer Behavior	3
VWV "THEA 307V -Society in Style" may be used to fulfill this degree requirement		3
Departmental Requirements		
CTFM 1110	Fundamentals of Fashion	3
CTFM 2120	Fashion Illustration	3
CTFM 2130	Concepts in Apparel Construction	3
CTFM 365	Apparel Analysis	3
CTFM 366	Historic Fashion and Society ⁴	3
or THEA 307V	Society in Style: Fashion, History and Culture	
CTFM 371	Textile Science	3
CTFM 372	Fashion Merchandising	3
CTFM 373	Advanced Apparel Construction II	3
CTFM 375	Fashion Buying	3
CTFM 401	Professional Development	1
CTFM 402	Field Experience ⁵	1-3
CTFM 403	Post-Field Experience	1
CTFM 460	Cultural Perspectives in Dress	3
CTFM 473	Flat Pattern for Apparel Design	3
CTFM 474	Fashion Promotion	3
CTFM 476	Draping for Apparel Design	3
CTFM 477	Capstone in Fashion Merchandising ⁶	3
Departmental Electives		
<i>Choose two courses from the following:</i>		6
CTFM 377	Fashion Study Tour	
Any FCST Course ⁷		
Any FCSC Course ⁷		
Non-Departmental Requirements		
ACCT 2110	Principles of Accounting I	3
MGMT 388V	Leadership and Ethics	3
MKTG 313	Retail Management	3
MKTG 317	International Marketing	3
<i>One MKTG 300 or above</i>		3
<i>Choose one course from the following:</i>		3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
<i>Choose one course from the following:</i>		3
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	

Second Language: (not required)	
Electives, to bring the total credits to 120 ^{8,9}	10
Total Credits	120-123

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses
- ² MATH 1350G Introduction to Statistics is required for the degree but students may need to take MATH 1215 as a prerequisite. If this course is used to fulfill the Math Basic Skills requirement, a C- or better is required.
- ³ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses.
- ⁴ Offered summers only.
- ⁵ A GPA of 2.5 or higher is required before enrolling in CTFM 402 Field Experience.
- ⁶ Should be completed last semester.
- ⁷ Please review prerequisites prior to enrolling.
- ⁸ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁹ ACES 1120 Freshman Orientation/ACES 1210 Financial Fitness for College Students are strongly recommended for freshmen.
NOTE: This degree includes the requirements necessary to complete a minor in Marketing. The student is responsible for completing the necessary paperwork in order for the minor to be awarded.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1350G Introduction to Statistics. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
English Composition - Level 1 Course ¹		4
ARTS 1145G	Visual Concepts	3
CTFM 1110	Fundamentals of Fashion	3
CTFM 2130	Concepts in Apparel Construction	3
Elective Course(s)		2
ACES 1120	Freshman Orientation (Strongly Recommended)	
ACES 1210	Financial Fitness for College Students (Strongly Recommended)	
Credits		15

Spring

English Composition - Level 2 Course ¹		3
MATH 1350G	Introduction to Statistics ³	3
Either an Area IV/V: Social/Behavioral Sciences Course or Humanities Course ^{1, 4}		3
CTFM 2120	Fashion Illustration	3
Choose one from the following:		3
AEEC 2140	Technology and Communication for Business Management	

BCIS 1110	Introduction to Information Systems	
Credits		15
Second Year		
Fall		
Oral Communication Course ¹		3
ACCT 2110	Principles of Accounting I	3
Any General Education Elective Course ¹		3-4
CTFM 365	Apparel Analysis	3
CTFM 371	Textile Science	3
Credits		15-16
Spring		
Either an Area IV/V: Social/Behavioral Sciences Course or Humanities ^{1,4}		3
Free Elective Course ²		3
CTFM 372	Fashion Merchandising	3
CTFM 375	Fashion Buying	3
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Credits		15
Third Year		
Fall		
MKTG 311V	Consumer Behavior	3
Area III: Laboratory Sciences Course ¹		4
CTFM 373	Advanced Apparel Construction II	3
CTFM 460	Cultural Perspectives in Dress	3
Choose one from the following:		3
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
Credits		16
Spring		
MKTG 313	Retail Management	3
CTFM 366	Historic Fashion and Society ⁵	3
or THEA 307V or Society in Style: Fashion, History and Culture		
CTFM 473	Flat Pattern for Apparel Design	3
CTFM 401	Professional Development	1
Free Elective Courses ²		5
Credits		15
Fourth Year		
Fall		
MKTG 317	International Marketing	3
MGMT 388V	Leadership and Ethics	3
FCST or FCSC Elective Courses ⁶		3
CTFM 474	Fashion Promotion	3
CTFM 402	Field Experience	1-3
CTFM 403	Post-Field Experience	1
Credits		14-16
Spring		
MKTG Elective Course (Upper-Division)		3
FCST or FCSC Elective Courses ⁶		3
Free Elective Course ²		3
CTFM 476	Draping for Apparel Design	3

CTFM 477	Capstone in Fashion Merchandising	3
Credits		15
Total Credits		120-123

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses
- ² Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ³ MATH 1350G Introduction to Statistics is required for the degree but students may need to take MATH 1215 as a prerequisite. If this course is used to fulfill the Math Basic Skills requirement, a C- or better is required.
- ⁴ One Area IV: Social/Behavioral Sciences course and one Area V: Humanities course must be taken in order to fulfill the General Education requirements
- ⁵ If THTR 307V is taken then students will not need to take an additional Viewing a Wider World course.
- ⁶ Departmental Electives can be completed by taking either CTFM 377 Fashion Study Tour, any FCS course or any FCSE course, but make sure to check any prerequisites on courses before enrolling.

Please Note: Many scholarships require enrollment in a minimum of 15 credits per semester, so additional elective coursework may be required to remain eligible for scholarships.

Food Science and Technology (Culinary Science) - Bachelor of Science in Food Science and Technology

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		
English Composition - Level 1 Course ¹		4
Area V/VI: Humanities or Creative/ Fine Arts Course ^{1, 2}		3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
FSTE 2110G	Food Science I	4
Credits		15
Spring		
Oral Communication Course ¹		3
Area V/VI: Humanities or Creative/ Fine Arts Course ^{1, 2}		3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4

HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
Credits		14

Second Year**Fall**

ENGL 2210G or ENGL 2210H	Professional & Technical Communication ³ or Professional and Technical Communication Honors	3
Choose one from the following:		3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
MATH 1430G	Applications of Calculus I	3
Elective Course ⁴		2
Credits		15

Spring

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
NUTR 2110	Human Nutrition	3
FSTE 2130G	Survey of Food and Agricultural Issues	3
ANSC 2310	Introduction to Meat Science	3
Elective Course ⁴		1
Credits		14

Third Year**Fall**

Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
FSTE 320	Food Microbiology	4
Elective Course ⁴		3
HRTM 307	Professional Development	1
Credits		16

Spring

FSTE 325	Food Analysis	3
FSTE 421	Food Chemistry	3
FSTE 423	Food Processing Technologies	4
BCHE 341	Survey of Biochemistry	4
Elective Course ⁴		1
Credits		15

Fourth Year**Fall**

ANTH 360V	Food and Culture Around the World	3
HRTM 363	Quantity Food Production and Service	4
HRTM 414	Wine Appreciation	3
FSTE 425	Sensory Evaluation of Foods and Product Development	3
Elective Course ⁴		3
Credits		16

Spring

FSTE 331	Food Preservation	3
HRTM 413	Restaurant Operations Management	4
HRTM 408	Hospitality Internship	1

Viewing the Wider World ⁵	3
Elective Course ⁴	4
Credits	15
Total Credits	120

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² Students must take one Area V: Humanities and one Area VI: Creative and Fine Arts course in order to complete the General Education requirements

³ MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

Food Science and Technology (Meat Science) - Bachelor of Science in Food Science and Technology

Food science is the science of food. Food scientists study the physical microbiological, and chemical makeup of food. Food technology is the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe food. The food industry is the largest manufacturing industry in the United States. This multidisciplinary field applies scientific disciplines including chemistry, microbiology, nutrition and engineering to develop new food products as well as the processes designed to improve food safety and the quality of foods. Food scientists develop new foods, add value to raw food commodities and improve the quality and safety of foods.

Consider exploring food science through our introductory course:

FSTE 2130G Survey of Food and Agricultural Issues which fulfills the general education Area III Laboratory Science requirement. Food scientists typically work in the food and beverage industry in the areas of quality assurance, product development, product procurement, research, sensory evaluation, sales, and food safety regulations. Graduates of the program will also be prepared for postgraduate studies leading to research, production and management careers in the food and feed industries, government and academia.

A minimum grade of C- is required in all classes with CHEM, BCHE, BIOL, FSTE, or NUTR prefix.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students are encouraged to use the elective hours to complete a minor in a related area such as chemistry, microbiology, and business. Consult an advisor for requirements.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
or ENGL 2210H	Professional and Technical Communication Honors	
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1430G	Applications of Calculus I ²	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
FSTE 2130G	Survey of Food and Agricultural Issues	3
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Viewing A Wider World ³		6
ANSC 351V	Agricultural Animals of the World	
Departmental Requirements		
FSTE 2110G	Food Science I	4
FSTE 320	Food Microbiology	4
FSTE 325	Food Analysis	3
FSTE 331	Food Preservation	3
FSTE 421	Food Chemistry	3
FSTE 423	Food Processing Technologies	4
FSTE 425	Sensory Evaluation of Foods and Product Development	3
NUTR 2110	Human Nutrition	3
<i>Meat Science Concentration</i>		
ANSC 2330	Animal Production	3
ANSC 301	Animal and Carcass Evaluation	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
Non-Departmental Requirements		
ANSC 2310	Introduction to Meat Science	3
BCHE 341	Survey of Biochemistry	4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
<i>Choose one course from following:</i>		3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
<i>Choose one course from following:</i>		3
A ST 311	Statistical Applications	

MATH 1350G	Introduction to Statistics
Second Language: (not required)	
Electives, to bring the total credits to 120 ⁴	21
Total Credits	120

- ¹ See the General Education (p. 220) Section of the catalog for a full list of courses
- ² MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.
- ³ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses
- ⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
English Composition - Level 1 Course ¹		4
Area V/VI: Humanities or Creative/ Fine Arts Course ^{1,2}		3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
FSTE 2110G	Food Science I	4
Credits		15

Spring

Oral Communication Course ¹		3
Area V/VI: Humanities or Creative/ Fine Arts Course ^{1,2}		3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
ANSC 2310	Introduction to Meat Science	3
Elective Course ³		2
Credits		15

Second Year

Fall		
ENGL 2210G or ENGL 2210H	Professional & Technical Communication or Professional and Technical Communication Honors	3
Choose one from the following:		3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
MATH 1430G	Applications of Calculus I ³	3
Elective Course ³		2
Credits		15

Spring		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
NUTR 2110	Human Nutrition	3
ANSC 2330	Animal Production	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
Elective Course ³		1
Credits		15
Third Year		
Fall		
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
FSTE 320	Food Microbiology	4
Elective Course ⁴		3
Credits		15
Spring		
FSTE 325	Food Analysis	3
FSTE 421	Food Chemistry	3
FSTE 423	Food Processing Technologies	4
Elective Course ³		5
Credits		15
Fourth Year		
Fall		
ANSC 351V	Agricultural Animals of the World	3
FSTE 2130G	Survey of Food and Agricultural Issues	3
BCHE 341	Survey of Biochemistry	4
FSTE 425	Sensory Evaluation of Foods and Product Development	3
ANSC 301	Animal and Carcass Evaluation	3
Credits		16
Spring		
FSTE 331	Food Preservation	3
Viewing the Wider World ⁵		3
Elective Course ³		8
Credits		14
Total Credits		120

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² Students must take one Area V: Humanities and one Area VI: Creative and Fine Arts course in order to complete the General Education requirements

³ MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology

Food science is the science of food. Food scientists study the physical microbiological, and chemical makeup of food. Food technology is the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe food. The food industry is the largest manufacturing industry in the United States. This multidisciplinary field applies scientific disciplines including chemistry, microbiology, nutrition and engineering to develop new food products as well as the processes designed to improve food safety and the quality of foods. Food scientists develop new foods, add value to raw food commodities and improve the quality and safety of foods.

Consider exploring food science through our introductory course: FSTE 2110G Food Science I which fulfills the general education Area III Laboratory Science requirement. Food scientists typically work in the food and beverage industry in the areas of quality assurance, product development, product procurement, research, sensory evaluation, sales, and food safety regulations. Graduates of the program will also be prepared for postgraduate studies leading to research, production and management careers in the food and feed industries, government and academia.

A minimum grade of C- is required in all classes with CHEM, BCHE, BIOL, FSTE, or NUTR prefix.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
or ENGL 2210H	Professional and Technical Communication Honors	
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1430G	Applications of Calculus I ²	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
FSTE 2130G	Survey of Food and Agricultural Issues	3
<i>Area V: Humanities</i> ¹		3

Area VI: Creative and Fine Arts ¹		3
<i>General Education Elective</i>		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Viewing A Wider World ³		6
Departmental Requirements		
FSTE 2110G	Food Science I	4
FSTE 320	Food Microbiology	4
FSTE 325	Food Analysis	3
FSTE 331	Food Preservation	3
FSTE 421	Food Chemistry	3
FSTE 423	Food Processing Technologies	4
FSTE 425	Sensory Evaluation of Foods and Product Development	3
NUTR 2110	Human Nutrition	3
<i>Science, Technology and Engineering Concentration</i>		
FSTE 1120	ACES in the Hole Foods I	4
FSTE 2120	ACES in the Hole Foods II	4
FSTE 375	Professional Development in Food Science	1
FSTE 475	ACES Foods at NMSU-Experiential Learning	1
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
Non-Departmental Requirements		
ANSC 2310	Introduction to Meat Science	3
BCHE 341	Survey of Biochemistry	4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
<i>Choose one course from the following:</i>		3
AECC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
<i>Choose one course from the following:</i>		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		17
Total Credits		120

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.

³ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
English Composition - Level 1 Course ¹		4
Area V/VI: Humanities or Creative/ Fine Arts Course ^{1,2}		3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
FSTE 2110G	Food Science I	4
Credits		15

Spring

Oral Communication Course ¹		3
Area V/VI: Humanities or Creative/ Fine Arts Course ^{1,2}		3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
FSTE 1120	ACES in the Hole Foods I	4
Elective Course ³		1
Credits		15

Second Year

Fall		
ENGL 2210G or ENGL 2210H	Professional & Technical Communication or Professional and Technical Communication Honors	3
Choose one from the following:		3
AECC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
MATH 1430G	Applications of Calculus I ⁴	3
Elective Course ³		2
Credits		15

Spring

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
NUTR 2110	Human Nutrition	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
FSTE 2120	ACES in the Hole Foods II	4
Credits		15

Third Year

Fall		
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
FSTE 320	Food Microbiology	4
Elective Course ⁴		3
Credits		15

Spring

FSTE 325	Food Analysis	3
FSTE 421	Food Chemistry	3
FSTE 423	Food Processing Technologies	4
FSTE 375	Professional Development in Food Science	1
Elective Course ³		4

Credits **15**

Fourth Year**Fall**

Viewing the Wider World ⁵		3
FSTE 2130G	Survey of Food and Agricultural Issues	3
BCHE 341	Survey of Biochemistry	4
FSTE 425	Sensory Evaluation of Foods and Product Development	3
ANSC 2310	Introduction to Meat Science	3

Credits **16**

Spring

FSTE 331	Food Preservation	3
Viewing a Wider World ⁵		3
FSTE 475	ACES Foods at NMSU-Experiential Learning	1
Elective Course ³		7

Credits **14**

Total Credits **120**

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² Students must take one Area V: Humanities and one Area VI: Creative and Fine Arts course in order to complete the General Education requirements

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.

⁵ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

Human Development & Family Science - Bachelor of Science

This major stresses the interrelationship of individuals across the life span and the impact of social and economic factors on the family system. Graduates are prepared for professional work with social and community agencies and other programs serving children and families. This degree program has been deemed a CFLE-approved academic program by the National Council on Family Relations. After successfully completing the required coursework, students are considered proficient in the ten Family Life Education Content Areas and may apply for provisional certification. Provisional CFLEs may achieve full certification as soon as they document sufficient work experience in family life education. You must work closely with an advisor. You must achieve a grade of C- or higher in your required core and minor courses, and must retake required courses with a grade lower than C-.

You must have a GPA of 2.5 or higher before enrolling in FCST 424 Field Experience: Issues and Ethics; and FCSC 348 Teaching in Informal Family and Consumer Sciences Settings. Students are recommended to declare a minor related to the FCST field such as CAST, CEPY, ECED, GERO, PHLS, PSYC, SOCI, SOWK and GNDR in order to solidify the minor/elective requirements below and the suggested roadmap.

General Education Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
PHLS 1110G	Personal Health & Wellness	
Area III: Laboratory Sciences Course (4 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
FCST 1130	Interpersonal Skills in Intimate Relationships	3
FCST 2110	Infancy Through Middle Childhood in the Family	3
FCST 2135	Adolescent Development and the Family	3
FCST 2140	Adult Development and Aging	3
FCST 301	Family Resource Management	3
FCST 380	Family Dynamics	3
FCST 383	Parenting and Child Guidance	3
FCST 424	Field Experience: Issues and Ethics	3
FCST 449V	Family Ethnicities and Subcultures	3
FCSC 400	Research Methods in Family and Consumer Sciences	3
FCSC 345	Management Concepts in Family and Consumer Sciences Teaching	3
or FCSC 348	Teaching in Informal Family and Consumer Sciences Settings	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		46-49
CAST 301V	Introduction to Child Advocacy (recommended)	
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
FCST 1130	Interpersonal Skills in Intimate Relationships (C- or better)	3
Two courses from declared Minor or Electives (C- or better) ¹		6
Elective Course ²		2
Credits		15
Spring		
Either an Area III/IV: Laboratory Sciences or Social Behavioral Sciences Course ³		3-4
Area V: Humanities Course ³		3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics Course ³		3-4
Choose one from the following: ⁴		3
FCST 2110	Infancy Through Middle Childhood in the Family (C- or better)	
FCST 2135	Adolescent Development and the Family (C- or better)	
FCST 2140	Adult Development and Aging (C- or better)	
FCST 449V	Family Ethnicities and Subcultures (C- or better)	
Credits		15-17

Second Year

Fall		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
General Education Elective Course ³		3-4
Area VI: Creative & Fine Arts Course ³		3
FCST 380	Family Dynamics (C- or better)	3

FCSC 348 or FCSC 345	Teaching in Informal Family and Consumer Sciences Settings ⁵ or Management Concepts in Family and Consumer Sciences Teaching	3
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Credits		15-16
Spring		
Area III: Laboratory Science Course ³		4
VWW - Viewing a Wider World Course ⁶		3
Choose two from the following: ⁴		6
FCST 2110	Infancy Through Middle Childhood in the Family (C- or better)	
FCST 2135	Adolescent Development and the Family (C- or better)	
FCST 2140	Adult Development and Aging (C- or better)	
FCST 449V	Family Ethnicities and Subcultures (C- or better)	
Credits		13

Third Year

Fall		
FCST 383	Parenting and Child Guidance	3
FCST 301	Family Resource Management	3
VWW - Viewing a Wider World ⁶		3
Elective Course ²		3
CAST 301V	Introduction to Child Advocacy (recommended)	
Choose one from the following: ⁴		3
FCST 2110	Infancy Through Middle Childhood in the Family (C- or better)	
FCST 2135	Adolescent Development and the Family (C- or better)	
FCST 2140	Adult Development and Aging (C- or better)	
FCST 449V	Family Ethnicities and Subcultures (C- or better)	
Credits		15

Spring		
Elective Course ²		3
Three courses from declared Minor or Electives (C- or better) ¹		9
Choose one from the following: ⁴		3
FCST 2110	Infancy Through Middle Childhood in the Family (C- or better)	
FCST 2135	Adolescent Development and the Family (C- or better)	
FCST 449V	Family Ethnicities and Subcultures (C- or better)	
Credits		15

Fourth Year

Fall		
FCST 424	Field Experience: Issues and Ethics (C- or better)	3
PHLS 1110G	Personal Health & Wellness	3
Elective Course ²		3
FCSC 400	Research Methods in Family and Consumer Sciences ((2.5 GPA to enroll, and a C- or better))	3
Elective Courses ²		6
Credits		18

Spring		
Elective Course ²		3
Two courses from declared Minor or Electives (C- or better) ¹		6

Elective Course (minimum) ²	5
Credits	14
Total Credits	120-123

¹ Minor courses are selected with the approval of an FCS advisor from a minor related to the FCS field such as CAST, C EP, ECED, GERO, PHLS, PSY, SOC, S WK and W S.

If a minor isn't declared, elective courses can be used.

² Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

³ See the General Education (p. 220) section of the catalog for a full list of courses

⁴ FCST 2110 Infancy Through Middle Childhood in the Family, FCST 2135 Adolescent Development and the Family, FCST 2140 Adult Development and Aging and FCST 449V Family Ethnicities and Subcultures must all be taken in order to fulfill degree requirements, however the order in which the courses are taken is up to the students.

⁵ A 2.5 GPA is required to enroll in either course and students must complete the course, that is selected, with a C- or better.

⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences

This concentration prepares students to become nutrition educators that work within the community and public health settings. This concentration focuses on health and wellness, the association between nutrition and health, and teaching healthy living. Graduates from the Nutrition Education concentration will have learned the skills to communicate evidence-based nutrition information, provide nutrition education, and blend nutrition with other health science subjects. The job opportunities for those graduating from this program include working as a nutrition educator or nutrition assistant in county agencies, Extension Services, community nutrition programs, schools and with health organizations.

Unlike the Dietetics concentration, this concentration does **not** prepare students to pursue the credential of a Registered Dietitian.

Concentration: Nutrition Education (General)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Due to the large number of PHLS course in the Nutrition Education option, students are encouraged to pursue a Public Health minor. Please see an

advisor for more information and to view a Nutrition Education & Public Health minor roadmap.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ^{1,4}		
Choose one ENGL Course from the following:		
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ²	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHLS 1110G	Personal Health & Wellness	3
<i>Area V: Humanities</i>		
PHIL 1145G	Philosophy, Law, and Ethics	3
or PHIL 2110G	Introduction to Ethics	
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
FSTE 2110G	Food Science I	4
Viewing A Wider World		
PHLS 3120V	Women's Health Issues	3
One other Viewing a Wider World course ³		3
Departmental/College Requirements		
FCST 1130	Interpersonal Skills in Intimate Relationships	3
FCST 2135	Adolescent Development and the Family	3
FCST 2140	Adult Development and Aging	3
FCSC 2250	Overview of Family and Consumer Sciences Teaching	3
FCSC 345	Management Concepts in Family and Consumer Sciences Teaching	3
FCSC 445	Career and Technical Education Programs	3
FCSC 446	Teaching Methods I for Family and Consumer Sciences	3
FCSC 447	Teaching Methods II for Family and Consumer Sciences	3
NUTR 2110	Human Nutrition	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional	1
NUTR 3110	Nutrition Throughout the Lifecycle	3
NUTR 4210	Community Nutrition	3
NUTR 4220	Food Service Organization and Management	3
NUTR 4233	Nutrition Counseling and Education	3
NUTR 4565	Field Experience Community Nutrition	2
HRTM 363	Quantity Food Production and Service	4
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1

HRTM 2120	Food Production and Service Fundamentals	3
Choose one from the following:		3
AXED 4510	Introduction to Research Methods	
FCSC 400	Research Methods in Family and Consumer Sciences	
PHLS 4310	Biometrics and Health Research	
PSYC 310	Experimental Methods	
SOCI 3150	Social Research: Methods	
Choose one from the following:		4-5
FSTE 320	Food Microbiology	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory	

Non-Departmental Requirements

PHLS 2110	Foundations of Health Education	3
PHLS 3220	Foundations of Public Health	3
PHLS 4810	Infectious and Noninfectious Disease Prevention	3
PHLS 4610	Health Disparities: Determinants and Interventions	3
PHLS 4620V	Cross-Cultural Aspects of Health	3
Choose one from the following:		4

BIOL 2210	Human Anatomy and Physiology I for the Health Sciences	
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	
Choose one from the following:		4
BIOL 2221	Human Physiology	
BIOL 2225	Human Anatomy and Physiology II	
SPMD 3210 & 3210L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
SPMD 3410	Exercise Physiology	

Recommended courses that are not required for the degree or verification statement

ACES 1120	Freshman Orientation (Highly recommended if new to NMSU)	
or ACES 1210	Financial Fitness for College Students	

Electives, to bring the total credits to 120 **0**

Total Credits **120-121**

¹ See the General Education (p. 220) section of the catalog for a full list of courses. Please refer to the HNDS Undergraduate Student Handbook for a list of recommended courses to choose from in order to fulfill these requirements.

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

**Refer to the "List of Recommended GE courses" for HNDS students in the HNDS Undergraduate Student Handbook for a list of field-related course options that can be selected from the GE Core Curriculum and Viewing a Wider World course requirements.*

⁴ Students who have taken a second level English course may be required to take another to fulfill the program's technical/scientific writing requirement.

Concentration: Nutrition Education**A Suggested Plan of Study for Students**

This roadmap assumes student placement in MATH 1220G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Please meet with an advisor to determine course progression.

First Year

Fall		Credits
ENGL 1110G	Composition I (C or better)	4
MATH 1220G	College Algebra (C or better) ¹	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Recommended courses for 2 credits (not required) ²		
ACES 1120 or ACES 1210	Freshman Orientation or Financial Fitness for College Students	
Credits		14

Spring

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication (C or better)	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science (C or better)	
NUTR 2120	Seminar I - Becoming a Nutrition Professional (C or better and only available in Spring semesters)	1
PHLS 1110G	Personal Health & Wellness	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
NUTR 2110	Human Nutrition (C or better)	3
Credits		14

Second Year

Fall		
FCST 1130	Interpersonal Skills in Intimate Relationships	3
FCSC 2250	Overview of Family and Consumer Sciences Teaching (C or better and only available in Fall semesters)	3
FSTE 2110G	Food Science I (C or better)	4
Choose one from the following:		4
BIOL 2210	Human Anatomy and Physiology I for the Health Sciences (at DACC only/ C or better)	

SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory (C or better)	
Credits		14
Spring		
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
PHIL 1145G or PHIL 2110G	Philosophy, Law, and Ethics or Introduction to Ethics	3
Choose one from the following:		3
PHLS 3210	Foundations of Community Health Education (C- or better)	
PHLS 2110	Foundations of Health Education (C- or better and at DACC only)	
Choose one from the following:		4
BIOL 2221	Human Physiology (C or better)	
BIOL 2225	Human Anatomy and Physiology II (C or better and at DACC only)	
SPMD 3410	Exercise Physiology (C or better)	
SPMD 3210 & 3210L	Anatomy and Physiology II and Anatomy and Physiology II Lab (C or better in both)	
Credits		14
Third Year		
Fall		
Choose one from the following:		4-5
FSTE 320	Food Microbiology (C or better)	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory (C or better for both)	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory (C or better for both)	
FCST 2135	Adolescent Development and the Family (C or better)	3
PHLS 3120V	Women's Health Issues	3
PHLS 3220	Foundations of Public Health (C- or better)	3
NUTR 3110	Nutrition Throughout the Lifecycle (C or better)	3
Credits		16-17
Spring		
Choose one from the following:		3
AXED 4510	Introduction to Research Methods ³	
FCSC 400	Research Methods in Family and Consumer Sciences	
PHLS 4310	Biometrics and Health Research	
PSYC 310	Experimental Methods	
SOCI 3150	Social Research: Methods	
FCST 2140	Adult Development and Aging (C or better)	3
FCSC 345	Management Concepts in Family and Consumer Sciences Teaching (C or better and only available in Spring semesters)	3
PHLS 4620V	Cross-Cultural Aspects of Health (C- or better)	3
HRTM 363	Quantity Food Production and Service	4
Credits		16
Fourth Year		
Fall		
NUTR 4210	Community Nutrition	3

PHLS 4610	Health Disparities: Determinants and Interventions	3
NUTR 4233	Nutrition Counseling and Education (C or better, Fall only)	3
NUTR 4220	Food Service Organization and Management (C or better, Fall only)	3
FCSC 445	Career and Technical Education Programs	3
FCSC 446	Teaching Methods I for Family and Consumer Sciences (C or better and only available in Fall semesters)	3
Credits		18
Spring		
PHLS 4810	Infectious and Noninfectious Disease Prevention (C or better and only available in Spring semesters)	3
NUTR 4565	Field Experience Community Nutrition	2
FCSC 447	Teaching Methods II for Family and Consumer Sciences (C or better, Spring only)	3
VWW - Viewing a Wider World Course ⁴		3
Area VI: Creative & Fine Arts Course ⁵		3
Credits		14
Total Credits		120-121

¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

² Not required for the degree. Highly recommended if new to NMSU

³ AXED 4510 Introduction to Research Methods is only taught in the Fall semesters, this will require changes to year three- spring and year four- fall semesters, speak with your advisor if you'd like to take this course.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses, cannot be offered through the College of Health and Social Services.

⁵ See the General Education (p. 220) section of the catalog for a full list of courses

Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences

The Dietetics option prepares students to become registered dietitians (RD) and dietetic technicians, registered (DTR). This option encompasses nutritional science, clinical dietetics, community nutrition, food science and food service management.

All students enrolled in this option begin as Pre-Dietetics students.

All Pre-Dietetics students are required to apply for admission into the Dietetics option in the fall semester of their junior year as indicated on the Pre-Dietetics/Dietetics road map. Please refer to the HNDS Undergraduate Student Handbook for information on the admissions criteria, application instructions, and the application process. Pre-Dietetic students are termed Dietetic students upon formal notification of admission into the Dietetics program.

The Dietetics option is a Didactic Program in Dietetics (DPD) that is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). This option enables graduates to continue pursuing

the credentials of a registered dietitian (RD). Becoming an RD is currently a three-step process:

1. Successfully complete an ACEND-accredited DPD program (e.g. the NMSU Dietetics Option), earn a degree and a verification statement
 - a. The verification statement ensures eligibility to apply to the next step.
2. Successfully complete an ACEND-accredited Dietetic Internship (DI) program, earn another verification statement.
 - a. This 2nd verification statement ensures eligibility to begin the next step.
3. Pass the Commission on Dietetic Registration (CDR) registration exam.

To earn a Verification Statement from the NMSU DPD, students must:

1. Complete all classes outlined in the Dietetics option roadmap.
2. Attain a C or higher (on campus or transfer) in classes with CHEM, BCHE, BIOL, SPMD, AHS/CHSS/NURS, FSTE and NUTR prefixes (C- does not count toward degree).

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ^{1,4}		
Choose one ENGL course from the following:		
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science Oral Communication ¹	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ²	3
or MATH 1430G	Applications of Calculus I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
PHLS 1110G	Personal Health & Wellness (Recommended) ¹	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
Choose one sequence from the following (4 credits):		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
<i>Area V: Humanities</i>		3
PHIL 1145G	Philosophy, Law, and Ethics (recommended)	

or PHIL 2110G	Introduction to Ethics	
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
FSTE 2110G	Food Science I	4
Viewing A Wider World ³		6
Departmental/College Requirements		
FCSC 348	Teaching in Informal Family and Consumer Sciences Settings	3
FSTE Upper Division Course - any 300 or 400 level FSTE, except FSTE 430		3-4
NUTR 2110	Human Nutrition	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional	1
NUTR 3110	Nutrition Throughout the Lifecycle	3
NUTR 3120	Food for Health	4
NUTR 3710	Food Systems & Policy in Dietetics	3
NUTR 3750	Applied Nutrition Research	3
NUTR 4110	Advanced Nutrition	3
NUTR 4210	Community Nutrition	3
NUTR 4220	Food Service Organization and Management	3
NUTR 4230	Medical Nutrition Therapy I	3
NUTR 4230L	Medical Nutrition Therapy I Lab	1
NUTR 4233	Nutrition Counseling and Education	3
NUTR 4235	Entering the Field of Dietetics	1
NUTR 4240	Medical Nutrition Therapy II	3
NUTR 4240L	Medical Nutrition Therapy II Laboratory	1
NUTR 4565	Field Experience Community Nutrition	1
Choose one from the following:		4-5
FSTE 320	Food Microbiology	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311 or MATH 1350G	Statistical Applications Introduction to Statistics	3
ACCT 2110	Principles of Accounting I	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Choose one from the following:		4-8
CHEM 2115	Survey of Organic Chemistry and Laboratory	
CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
BCHE 341	Survey of Biochemistry	4
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
Select one from the following:		4
BIOL 2210	Human Anatomy and Physiology I for the Health Sciences	
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	
Select one from the following:		3-4
BIOL 2225	Human Anatomy and Physiology II	
BIOL 2221	Human Physiology	
SPMD 3210 & 3210L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
SPMD 3410	Exercise Physiology	

Choose one from the following:		3
AHS 120	Medical Terminology	
SPMD 1120	Medical Terminology	
NURS 150	Medical Terminology	
Second Language: (not required)		
Electives, to bring the total credits to 121		0
Total Credits		121-128

¹ See the General Education (p. 220) section of the catalog for a full list.

Please refer to the *HNDS Undergraduate Student Handbook* for a list of recommended courses to choose from in order to fulfill these requirements.

² MATH 1220G College Algebra or MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1430G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Refer to the "List of Recommended GE courses" for HNDS students in the *HNDS Undergraduate Student Handbook* for a list of field-related course options that can be selected from the GE Core Curriculum and Viewing a Wider World course requirements.

⁴ Students who have taken a second level English course may be required to take another to fulfill the program's technical/ scientific writing requirement.

A Suggested Plan of Study for Students

During the following semesters, a student may need to submit for an overload to enroll in over 18 credits of course work (see the NMSU Regulations section-Course Load for Undergraduate Students (p. 40) for more information):

- Third Year- Fall Semester

This roadmap assumes student placement in MATH 1220G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ^{1,2}	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C or better) ^{1,3}	4
Area IV: Social Behavioral Science Course ^{1,4}		3
PHLS 1110G	Personal Health & Wellness (Recommended)	
Recommended courses (not required)		
ACES 1120	Freshman Orientation	
ACES 1210	Financial Fitness for College Students	
Credits		14
Spring		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C or better) ^{1,3}	4
Choose one from the following:		4

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (C or better) ^{1,3}	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (C or better) ^{1,3}	
Choose one from the following:		3
ENGL 2130G	Advanced Composition (C or better)	
ENGL 2210G	Professional & Technical Communication (C or Better)	
ENGL 2210H	Professional and Technical Communication Honors (C or better)	
ENGL 2215G	Advanced Technical and Professional Communication (C or better)	
ENGL 2221G	Writing in the Humanities and Social Science (C or Better)	
NUTR 2110	Human Nutrition (C or better) ^{1,3}	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional (C or better and only available in Spring Semesters) ^{1,3}	1
Credits		15
Second Year		
Fall		
FSTE 2110G	Food Science I (C or better) ^{1,3}	4
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry ^{1,3}	1
Choose one from the following:		4-8
CHEM 2115	Survey of Organic Chemistry and Laboratory (C or better) ^{1,3}	
CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory (C or better) ⁵	
ACCT 2110	Principles of Accounting I ^{1,3}	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture ¹	
COMM 1115G	Introduction to Communication ¹	
COMM 1130G	Public Speaking ¹	
Credits		15-19
Spring		
HRTM 2120	Food Production and Service Fundamentals ^{1,3}	3
Area V: Humanities Course ^{1,4}		
PHIL 1145G or PHIL 2110G	Philosophy, Law, and Ethics (either recommended) or Introduction to Ethics	3
Choose one from the following:		4
BIOL 2210	Human Anatomy and Physiology I for the Health Sciences (C or better, at DACC) ^{1,3}	
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory (C or Better) ¹	
BCHE 341	Survey of Biochemistry (C or better) ^{1,3}	4
A ST 311 or MATH 1350G	Statistical Applications ^{1,3} or Introduction to Statistics	3
Credits		17

Third Year**Fall**

Choose one from the following: 3-4

BIOL 2221	Human Physiology (C or better) ^{1,3}	
BIOL 2225	Human Anatomy and Physiology II (C or better, at DACC) ^{1,3}	
SPMD 3210 & 3210L	Anatomy and Physiology II and Anatomy and Physiology II Lab (C or better) ^{1,3}	
SPMD 3410	Exercise Physiology (C or better) ^{1,3}	

Choose one from the following: 4-5

FSTE 320	Food Microbiology (C or better and only available Fall semesters) ^{1,3}	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory (C or better)	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory (C or better)	

FCSC 348	Teaching in Informal Family and Consumer Sciences Settings (only available in Fall semesters) ^{1,3}	3
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NUTR 3110	Nutrition Throughout the Lifecycle (C or better, and only available in Fall semesters) ^{1,3}	3
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NUTR 3120	Food for Health (C or better, and only available in Fall semesters) ^{1,3}	4
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Apply to the HNDS- Didactic Program in Dietetics

Credits 17-19**Spring**FSTE Upper Division Course (C or better) Any 300 or 400 level FSTE except FSTE 430 ^{3,6} 3-4

FSTE 425	Sensory Evaluation of Foods and Product Development	
FSTE 475	ACES Foods at NMSU-Experiential Learning	
NUTR 3750	Applied Nutrition Research (C or better, and only available in Spring semesters) ^{3,7}	3
NUTR 4110	Advanced Nutrition (C or better, Spring only) ^{3,7}	3
NUTR 3710	Food Systems & Policy in Dietetics (C or better, Spring only) ^{3,7}	3

Choose one from the following: 3

AHS 120	Medical Terminology (C or better) ^{3,6}	
SPMD 1120	Medical Terminology (C or better) ^{3,6}	
NURS 150	Medical Terminology (C or better) ^{3,6}	

Credits 15-16**Fourth Year****Fall**Area VI - Creative & Fine Arts Course ³ 3

NUTR 4210	Community Nutrition (C or better, Fall only) ^{3,7}	3
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NUTR 4235	Entering the Field of Dietetics (C or better, Fall only) ^{3,7}	1
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NUTR 4230 & 4230L	Medical Nutrition Therapy I and Medical Nutrition Therapy I Lab (C or better, Fall only) ^{3,7}	4
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NUTR 4233	Nutrition Counseling and Education (C or better, Fall only) ^{3,7}	3
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NUTR 4220	Food Service Organization and Management (C or better, Fall only) ^{3,7}	3
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Credits 17**Spring**

VWW - Viewing a Wider World Course ^{6,8}		3
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NUTR 4565	Field Experience Community Nutrition ^{3,7}	1
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VWW - Viewing a Wider World Course ^{6,8}		3
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NUTR 4240 & 4240L	Medical Nutrition Therapy II and Medical Nutrition Therapy II Laboratory (C or better, Spring Only) ^{3,7}	4
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Credits 11**Total Credits** 121-128¹ Pre-Dietetics courses must be completed and/or enrolled in prior to applying to the Dietetics program.² MATH 1220G College Algebra or MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra/MATH 1220G College Algebra or MATH 1430G Applications of Calculus I/MATH 1430G Applications of Calculus I first.³ **Courses are required for application to a dietetic internship, GPAs in the application will be calculated using these classes.**⁴ See the General Education (p. 220) section of the catalog for a full list.⁵ CHEM 313 Organic Chemistry I, CHEM 314 Organic Chemistry II, and CHEM 315 Organic Chemistry Laboratory combination for the Organic Chemistry requirement is a total of 8 credits,⁶ Required courses are upper-division courses that can be completed in the junior year prior to admission to the Dietetics program.⁷ Dietetics courses can only be completed by Dietetic students who have been admitted into the Dietetics program.⁸ See the Viewing a Wider World (p. 224) section of the catalog for a full list.

Child Advocacy Studies (CAST) - Undergraduate Minor

A minor in Child Advocacy Studies (CAST) is available. The minor requires a minimum of 18 hours of which 9 hours are specifically concentrated in the area of child advocacy at the 300 or higher level. Specific coursework requirements apply and consultation with an advisor for course requirements and scheduling is urged.

Culinary Science - Undergraduate Minor

A minor in Culinary Science is available. The minor requires a minimum of 20 credits of which a minimum of 9 hours must be at the 300 or higher level. A grade of "C-" or better is required in all classes to be counted towards the minor. Prerequisites for a given course must be completed before taking the course or consent of instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
FSTE 2110G	Food Science I	4
FSTE 320	Food Microbiology	4
HRTM 363	Quantity Food Production and Service	4
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
HRTM 413	Restaurant Operations Management	4
Total Credits		20

Fashion Merchandising & Design - Undergraduate Minor

A minor in Fashion Merchandising and Design is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the 300 or higher level. A grade of "C" or better is required in all classes to be counted towards the minor. Prerequisites for a given course must be completed before taking the course or consent of instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
Course Requirements		
CTFM 1110	Fundamentals of Fashion	3
CTFM 2130	Concepts in Apparel Construction	3
CTFM 371	Textile Science	3
Choose three Upper-Division courses from the following:		9
CTFM 372	Fashion Merchandising	
CTFM 373	Advanced Apparel Construction II	
CTFM 375	Fashion Buying	
CTFM 377	Fashion Study Tour	
CTFM 460	Cultural Perspectives in Dress	
CTFM 473	Flat Pattern for Apparel Design	
CTFM 474	Fashion Promotion	
CTFM 476	Draping for Apparel Design	
Total Credits		18

Food Science - Undergraduate Minor

A minimum of 18 credits of courses with the FSTE prefix are required for a minor in Food Science and Technology. A grade of "C-" or better is required in all classes to be counted toward the minor. Prerequisites for a given course must be completed before taking the course, or consent of instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
Required Courses		
FSTE 320	Food Microbiology	4
FSTE 425	Sensory Evaluation of Foods and Product Development	3
FSTE 475	ACES Foods at NMSU-Experiential Learning	1
<i>Electives (select at least three courses from the following):</i>		<i>10</i>
FSTE 325	Food Analysis	
FSTE 421	Food Chemistry	
FSTE 423	Food Processing Technologies	
FSTE 430	Brewing Science & Engineering	
Total Credits		18

Human Development and Family Science - Undergraduate Minor

A minor in Human Development and Family Science is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the 300 or higher level. Specific coursework requirements may apply. See an advisor for course requirements and scheduling.

Nutrition - Undergraduate Minor

A minor in Human Nutrition is available. The minor requires a minimum of 19 hours. Specific coursework requirements may apply, including prerequisites. See an advisor for course requirements and scheduling. Students should take the following courses:

Prefix	Title	Credits
Required Courses		
NUTR 2120	Seminar I - Becoming a Nutrition Professional (only offered in Spring semesters)	1
NUTR 2110	Human Nutrition	3
NUTR 3110	Nutrition Throughout the Lifecycle (only offered in Fall semesters)	3
Choose a minimum of 12 credits from the following		12
HRTM 363	Quantity Food Production and Service	
NUTR 3710	Food Systems & Policy in Dietetics (only offered in Spring semesters)	
NUTR 3750	Applied Nutrition Research (only offered in Spring semesters)	
NUTR 4220	Food Service Organization and Management (only offered in Fall semesters)	
NUTR 4233	Nutrition Counseling and Education (only offered in Fall semesters)	
Total Credits		19

Fish, Wildlife and Conservation Ecology

Undergraduate Program Information

Through lecture courses, labs, hands-on field experience and internships, the Department of Fish, Wildlife and Conservation Ecology will prepare you for a career in a variety of natural resource fields related to the conservation and management of wild animal populations and the natural systems they perpetuate. Award-winning professors will guide students in the study of how to manage fish and wildlife populations, their habitats, how their populations grow and contract, how different species influence the biotic community in which they live and how natural systems are affected by human activities.

Bachelor of Science in Fish, Wildlife and Conservation Ecology.

With the continuous growth of human populations and the ever dwindling of natural resources, natural resource professionals are needed now more than ever. Learn how to sustainably manage fish and wildlife populations and the habitats they utilize to ensure their long-term successful conservation. We offer two options within this degree. The Wildlife Ecology and Management option focuses on the ecology, conservation and management of wildlife (including mammals, birds, amphibians, and reptiles) in their natural habitats. The Aquatic Ecology and Management option focuses on the ecology, conservation and management of aquatic resources and the animals and plants found in them.

The department offers a minor in Wildlife Science for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

Bachelor of Science in Conservation Ecology

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the

conservation and wise use of natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from Fish, Wildlife and Conservation Ecology, Biology, and Geography.

This educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. If biochemistry is taken as an elective, this curriculum provides the necessary educational background for pre-vet requirements, thus preparing students for veterinary school and future jobs such as wildlife or zoo veterinarian, or conservation medicine practitioner. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The department offers a minor in Conservation Ecology for students majoring in other disciplines. The minor includes 20 credits.

To graduate from the Department of Fish, Wildlife and Conservation Ecology, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU.

Graduate Program Information

Master of Science in Fish, Wildlife and Conservation Ecology.

The Department of Fish, Wildlife and Conservation Ecology (FWCE) offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. Faculty members in the department also may advise Ph.D. candidates through the graduate program in the Department of Biology, Department of Animal and Range Sciences, Department of Plant and Environmental Sciences, as well as other Ph.D. granting departments. For additional information please see the graduate catalog entries for the respective departments.

Minimum qualifications for admission to the graduate program include the following:

- 3.0 grade-point average in the last two years of undergraduate work
- Students who are most competitive for admission are those with a combined average GRE score greater than 70th percentile on the verbal and quantitative parts of the GRE.
- Course work in zoology, botany and animal ecology and a basic appreciation of sustainable use of natural resources, with supporting courses in mathematics, chemistry, physics and written and oral communication.

Applicants should submit a written composition of approximately 350 words that indicates the applicant's reasons for pursuing advanced study, explains personal and educational goals, and any additional experiences (e.g., military or career) or skills that might provide a foundation for graduate study. Applicants should submit three letters of recommendation (it is preferred that at least two letters come from university instructors) along with official GRE scores (use NMSU code 4531). Applicants should also contact a faculty member in the department that they would like to work with as an advisor, and that faculty member needs to agree to serve as the student's advisor. Application forms, application fee and transcripts, GRE scores, letters of recommendation and letter of application should be submitted online to the Graduate School. Successful applicants will be selected from those who meet the criteria of grade-point average, GRE scores, and educational background described above and who appear to have professional promise as indicated by personal history and written references.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a thesis for most students. Of these credits, at least 15 must be in courses numbered 500 or above, and at least 15 must be for courses with the FWCE prefix. Those programs involving a thesis or research project include 4 to 6 credits of research (FWCE 598 Special Research Programs or FWCE 599 Master's Thesis). Students electing a minor in FWCE are required to take at least 9 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

All students in the program must complete the following requirements:

- A ST 505 Statistical Inference I or equivalent
- One semester of Graduate Seminar (FWCE 515 Graduate Seminar - may be repeated for credit)
- A minimum of 3 additional credits from the Quantitative Methods category in addition to A ST 505 Statistical Inference I (eligible courses listed below)
- One course each from the Ecological Concepts, Organismal Biology and Ecological Techniques categories (eligible courses listed below)
- 4 to 9 credits from the Independent Study category (eligible courses listed below)

In addition, a student may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas. Courses other than those listed may be acceptable, given permission by the student's supervisory committee

Degrees for the Department

Bachelor Degree(s)

- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 374)
- Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 376)
- Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 379)

Master Degree(s)

- Fish, Wildlife and Conservation Ecology - Master of Science (p. 148)

Minors for the Department

- Conservation Ecology - Undergraduate Minor (p. 381)
- Fish, Wildlife and Conservation Ecology - Graduate Minor (p. 214)
- Wildlife Science - Undergraduate Minor (p. 382)

Professor, Matt Gompper, Department Head

Professors Boeing, Boykin, Cain, Caldwell, Cowley, Desmond, Frey; **Assistant Professor** Gebreselassie, Klein, Lawson, Lavery

M.E. Gompper – Department Head, Ph.D. (Tennessee)– mammal ecology, management and conservation; W.J. Boeing, Ph.D. (Louisiana State University)– aquatic ecology; K.G. Boykin, Ph.D. (New Mexico State University)– spatial ecology and conservation; J. W. Cain, Ph.D. (University of Arizona)– large mammal ecology, conservation and management; C. A. Caldwell, Ph.D. (University of Tennessee)– fish biology; M.J. Desmond, Ph.D. (University of Nebraska)– avian ecology and conservation; J.K. Frey, Ph.D. (University of New Mexico)– ecology and conservation of mammals; F.A. Gebreselassie, Ph.D. (University of Bern Switzerland)- Capture-recapture models, Integrated population models; Z. Klein, Ph.D. (University of Idaho)- fish ecology, fisheries management, fish conservation, population ecology; A. Lawson, Ph.D. (Clemson University)-vertebrate population ecology, analytical tool development; T. Lavery, Ph.D. (Colorado State University)- applied population, community and conservation ecology

Fish, Wildlife and Conservation Ecology Courses

FWCE 1110G. Introduction to Natural Resources Management 4 Credits (3+2P)

This class covers historical and current issues affecting the management of renewable natural resources with an emphasis on water, soil, rangeland, forest, fish, and wildlife resources. An emphasis is placed on the scientific method and critical thinking. In the laboratory students collect and analyze field data on topics covered above and write up each unit as a laboratory report.

Learning Outcomes

1. Students should be able to recall, describe and explain the laws, treaties and acts that have led to our current management of natural resources in the United States.
2. Students should recognize or explain what ecological processes are, the importance of ecological processes in maintaining ecosystem function and how human activities change ecological processes and the ecosystems dependent on those processes.
3. In each of the six course and lab modules (water quality, soils, forestry, rangelands, wildlife and fisheries) students should be able to recall, describe and explain basic terminology, fundamental ecological principles and management techniques and challenges.
4. Students should be able to interpret data presented graphically and in tables from class exercises and lectures.
5. Students should be able to solve problems scientifically through field data collection, laboratory analyses and the use of quantitative methods (basic statistics, tables and graphs).
6. Students should be able to communicate results from laboratory exercises (6 lab modules) orally and in writing.
7. Students will learn to apply scientific thinking to real world problems through in class discussion and short essays based on material from case studies presented in class and guest speakers.

FWCE 1120. Contemporary Issues in Wildlife and Natural Resources Management 3 Credits (3)

Ecological, socioeconomic, and political issues surrounding the management of our natural resources with an emphasis on fish and wildlife resources.

FWCE 2110. Principles of Fish and Wildlife Management 3 Credits (3)

Basic principles of fish and wildlife management including history, ecology, economics, and policy. Emphasis on wildlife and fisheries. Uses an ecosystem approach integrating living and nonliving resources.

Prerequisite(s): FWCE 1110G.

Learning Outcomes

1. The goal of this course is to provide a firm foundation in the principles of wildlife and fisheries management.
2. Material will include a background in biological principles geared towards animal populations, characteristics and management of the habitats utilized by fish and wildlife, techniques used to study and manage animals and their habitats, and aspects of the human dimension involved in wildlife and fisheries issues.
3. This course serves as a core requirement for degrees offered in the Department of Fish, Wildlife and Conservation Ecology and as a required course for degrees in other departments such as Rangeland Resources.

FWCE 301. Wildlife Ecology 3 Credits (3)

General ecological theory with emphasis on concepts including biogeography, species interactions, population dynamics and disease ecology as they relate to the management and conservation of vertebrates. **Prerequisite(s):** BIOL 2610G

FWCE 330. Natural History of the Vertebrates 4 Credits (3+3P)

Evolution, ecology, and diversity of vertebrates. Topics include comparative anatomy and physiology, biogeography, community ecology, behavior, and conservation. Laboratory emphasizes identification of local taxa. Field trips may be required.

Prerequisite(s)/Corequisite(s): BIOL 322. **Prerequisite(s):** BIOL 2610G and BIOL 2610L.

FWCE 355. Wildlife Techniques and Analysis 4 Credits (3+2P)

FWCE 355 will provide a broad overview of basic skills and techniques that are commonly used by biologists in performing management, research, and reporting functions in natural resource fields with an emphasis on wildlife techniques, data processing and analysis.

Prerequisite(s): FWCE 301, A ST 311.

FWCE 357. Fisheries Management and Analysis 4 Credits (3+2P)

Lectures and laboratory exercises provide a broad overview of basic skills and techniques used for assessing and managing fish populations.

Prerequisite(s): FWCE 301 and A ST 311.

FWCE 391. Internship 1-3 Credits (1-3)

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/ U, Audit).

Prerequisite(s): Consent of instructor.

FWCE 393. Professional Experience and Communication**3 Credits (3)**

Professional work experience under the supervision of employer and/or a faculty member. Written report and presentation is required.

Prerequisite(s)/Corequisite(s): FWCE 2110.

FWCE 402. Seminar in Natural Resource Management**1 Credit (1)**

Review and discussion of current topics in natural resource management.

Prerequisite(s): Senior standing or above.

FWCE 409. Introduction to Population Ecology**3 Credits (3)**

Quantitative analysis of vital statistics and mechanisms affecting dynamics of wild populations. Patterns of growth, age structure, survival, and natality. Population theories and life tables.

Prerequisite(s): MATH 1430G and FWCE 2110.

FWCE 430. Avian Field Ecology**4 Credits (3+3P)**

Principles of avian ecology and management with an emphasis on taxonomy, physiology, behavior and field studies. Includes weekly field trips focusing on identification and behavior of Southwest birds.

Prerequisite(s)/Corequisite(s): FWCE 330.

FWCE 431. Mammalogy**4 Credits (3+2P)**

Classification, identification, anatomy, physiology, life history, and ecology of mammals. Field trips required.

Prerequisite(s): FWCE 2110 and FWCE 330.

FWCE 432. Environmental Biology of Fishes**4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 532.

Prerequisite(s): CHEM 1215G and senior standing.

FWCE 434. Aquatic Contaminants and Toxicology**4 Credits (3+3P)**

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Taught with FWCE 534. Crosslisted with: ENVS 434.

Prerequisite(s): CHEM 1215G and senior standing.

FWCE 437. Wildlife Damage Management**3 Credits (3)**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 537.

Prerequisite(s): BIOL 2610G, FWCE 2110, FWCE 301, FWCE 409.

FWCE 447. Wildlife Law and Policy**3 Credits (3)**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 547.

Prerequisite(s): Junior or Senior level standing.

FWCE 448. Problems**1-3 Credits (1-3)**

Individual investigations in fishery or wildlife science. Maximum 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): 18 credits in WLSC.

FWCE 450. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester. May be repeated up to 9 credits. Consent of Instructor required.

FWCE 457. Ecological Biometry**3 Credits (3)**

Use of ecological data to test scientific hypotheses, stochastic and statistical models for environmental data, data visualization, likelihood-based and information-based model selection. Emphasis on open-source software tools.

Prerequisite(s): MATH 1430G or MATH 1511G, A ST 311, FWCE 301.

FWCE 459. Aquatic Ecology**4 Credits (4)**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 559.

Prerequisite(s): FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

FWCE 464. Management of Aquatic and Terrestrial Ecosystems**3 Credits (3)**

Principles and methods for managing aquatic and terrestrial ecosystems and their fish and wildlife resources. Emphasis on quantitative techniques, data collection and analysis for management of systems at a landscape spatial scale.

Prerequisite: (BIOL 301 or FWCE 301) FWCE 330, A ST 311.

Learning Outcomes

1. Demonstrate an understanding of The North American Model and the Public Trust Doctrine.
2. Demonstrate an understanding of the funding mechanisms underlying fish and wildlife management.
3. Demonstrate an understanding of the policies and laws germane to fish and wildlife management.
4. Demonstrate an understanding of the constraints facing modern fish and wildlife management.
5. Exhibit effective written and verbal communication skills.

FWCE 467. Herpetology**4 Credits (4)**

Systematics, taxonomy, ecology, behavior, and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 567.

Prerequisite(s): FWCE 330.

FWCE 471. GIS for Natural Resource Scientists**4 Credits (4)**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 571.

FWCE 472. Wildlife Museum Internship**1-4 Credits (1-4)**

Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): BIOL 2610G and BIOL 2610L.

FWCE 482. Ichthyology**4 Credits (3+2P)**

Classification, morphology, identification, life history, and ecology of fishes.

Prerequisite(s): FWCE 330 or consent of instructor.

FWCE 509. Population Ecology (s)**3 Credits (2+2P)**

Quantitative analysis of vital statistics and mechanisms promoting stability in wild populations. Theory and application of life tables and population models.

FWCE 515. Graduate Seminar**1 Credit (1)**

Current topics.

FWCE 530. Large Mammal Ecology, Conservation and Management**3 Credits (3)**

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 436.

FWCE 532. Environmental Biology of Fishes**4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 432; however, students are responsible for all requirements in FWCE 432, plus additional assignments.

FWCE 535. Special Topics**1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

FWCE 537. Wildlife Damage Management**3 Credits (3)**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 437. Students are responsible for all requirements for FWCE 437 plus additional work. Prerequisite(s): BIOL 2610G, FWCE 2110, FWCE 301 and FWCE 409

FWCE 540. Wildlife Habitat Relationships**4 Credits (3+1P)**

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses.

Learning Outcomes

1. The addition of the laboratory component to the course will provide graduate students with hands on experience implementing current statistical approaches for modeling wildlife habitat relationships including selection ratios, resource selection functions, resource utilization functions, step-selection functions and other approaches.

FWCE 547. Wildlife Law and Policy**3 Credits (3)**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 447.

FWCE 548. Graduate Problems**1-3 Credits (1-3)**

Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree. May be repeated up to 6 credits.

FWCE 558. Nonthesis Project**1-6 Credits (1-6)**

Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students. May be repeated up to 6 credits.

FWCE 559. Aquatic Ecology**4 Credits (4)**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 459.

Prerequisite(s): FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

FWCE 567. Herpetology**4 Credits (4)**

Systematics, taxonomy, ecology, behavior and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 467.

FWCE 571. GIS for Natural Resource Scientists**4 Credits (4)**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 471.

FWCE 582. Ichthyology**4 Credits (4)**

Classification, morphology, identification, life history, and ecology of fishes. Taught with FWCE 482.

FWCE 598. Special Research Programs**1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program. May be repeated up to 6 credits.

FWCE 599. Master's Thesis**1-9 Credits (1-9)**

Thesis. May be repeated up to 30 credits. Thesis/Dissertation Grading.

Office Location: Knox Hall 132

Phone: (575) 646-2245

Website: <http://aces.nmsu.edu/academics/fws/>

Conservation Ecology - Bachelor of Science in Conservation Ecology

Co-directors of the Program:

Professor, Michele Nishiguchi, Department Head, Biology

Professor, Matthew Gompper, Department Head, Fish, Wildlife and Conservation Ecology

Professors Bailey, Boecklen, Boeing, Caldwell, Cowley, Desmond, Gompper, Hanley, Houde, Milligan, Nishiguchi, Roemer, Smith, Wright; **Associate Professors** Cain, James, Mabry; **Assistant Professors** Ferrenberg, Orr

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of our Earth's natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from the Biology; Fish, Wildlife and Conservation Ecology; Geography; and Range Science departments.

The educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The requirements are listed below. In addition, each required course must be passed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		3
ENGL 2210G	Professional & Technical Communication (preferred)	
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		3-4
MATH 1430G	Applications of Calculus I ²	
or MATH 1521G	Calculus and Analytic Geometry II	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Choose one from the following (3 credits):		
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area V: Humanities</i> ¹		3

<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
FWCE 1110G	Introduction to Natural Resources Management	4
Viewing a Wider World		3
One VWW course will be met with the 9-credit rule ³		
Major Requirements		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301 or FWCE 301	Principles of Ecology Wildlife Ecology	3
BIOL 305 or AGRO 305	Principles of Genetics Principles of Genetics	3
BIOL 312 or RGSC 316	Plant Taxonomy Rangeland Plants	3
BIOL 313	Structure and Function of Plants	3
BIOL 322	Zoology	3
BIOL 455 or FWCE 457	Biometry Ecological Biometry	3
BIOL 462	Conservation Biology	3
BIOL 467	Evolution	3
BIOL 488 or BCHE 341	Principles of Conservation Genetics Survey of Biochemistry	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	3
<i>Physiology Requirement</i>		3-4
BIOL 314	Plant Physiology	
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BIOL 381	Animal Physiology	
ANSC 370	Anatomy and Physiology of Farm Animals	
FWCE 432	Environmental Biology of Fishes	
<i>Diversity of Life Requirement</i>		6-8
BIOL 465	Invertebrate Zoology	
BIOL 480	Animal Behavior	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	

PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		6-10
Select additional electives to bring total to 120 credits including 48 upper division credits. ⁵		
Total Credits		120

- ¹ See the General Education (p. 220) Section of the catalog for a full list of courses.
- ² Either MATH 1430G Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take any prerequisites needed to enter these courses.
- ³ One Viewing a Wider World (p. 224) course will be satisfied using the 9-hour rule: students with Biology as home department use FWCE courses and students with Fish, Wildlife and Conservation Ecology as home department use BIOL courses.
- ⁴ Other related courses may include BIOL 436 Disease Vector Biology, BIOL 442 Genomics Technology, BIOL 446 Bioinformatics and NCBI Database, BIOL 469 Biology of Emerging Infectious Diseases, BIOL 489 Genetic Aspects of Population Biology, ECON 337V Natural Resource Economics, GEOG 381 Cartography and Geographic Information Systems, GEOG 481 Fundamentals of Geographic Information Science (GIS), GEOL 1110G Physical Geology, GEOL 424 Soil Chemistry, POLS 378 U.S.-Mexico Border Politics, RGSC 318 Watershed Management, RGSC 325 Rangeland Restoration Ecology, RGSC 452 Vegetation Measurements for Rangeland Assessment.
- ⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Conservation Ecology there is no second language requirement for the degree.

Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology

The Department of Fish, Wildlife and Conservation Ecology prepares you for careers in a variety of natural resource fields related to the management of wild animal populations and the natural systems they share.

To graduate, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU. In addition, each required course must be passed with a grade of C- or better. The

department offers a minor in Fish, Wildlife and Conservation Ecology for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

The Aquatic Ecology and Management Concentration is for students who want to focus on fish and aquatic systems.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
English Composition - Level 2		
ENGL 2210G	Professional & Technical Communication	3
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1430G	Applications of Calculus I ¹	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		11
ECON 2110G	Macroeconomic Principles	
or ECON 2120G	Principles of Microeconomics	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Select one from the following:		
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
Area V: Humanities ²		3
Area VI: Creative and Fine Arts ²		3
General Education Elective		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Viewing a Wider World ³		3
The second VWV requirement (3 credits) may be filled with the 9-credit hour rule. Please see your advisor for more information.		
Departmental/College Requirements		
Departmental Core Courses (29 credits)		
FWCE 1110G	Introduction to Natural Resources Management ⁴	4
or FWCE 1120	Contemporary Issues in Wildlife and Natural Resources Management	
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3

FWCE 330	Natural History of the Vertebrates	4
FWCE 391	Internship	1
FWCE 393	Professional Experience and Communication	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 457	Ecological Biometry	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	3
Departmental Botany Requirements (9 credits)		
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
Select one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
Departmental Physiology Requirements (3-4 credits)		
Select 3-4 credits from the following:		3-4
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 314	Plant Physiology	
BIOL 381	Animal Physiology	
FWCE 432	Environmental Biology of Fishes	
Concentration Coursework		
Techniques		
FWCE 357	Fisheries Management and Analysis	4
Management		
Choose one from the following:		3-4
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
RGSC 318	Watershed Management	
Organismal Biology		
Choose one from the following: ⁵		3-4
BIOL 465	Invertebrate Zoology	
EPWS 462	Parasitology	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Wildlife Ecology and Management Electives ⁶		
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁷		
AGRO 305	Principles of Genetics	3
or BIOL 305	Principles of Genetics	
A ST 311	Statistical Applications	3
BIOL 322	Zoology	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Select one from the following:		4
GEOL 1110G	Physical Geology	
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁸		4-9
Total Credits		120

¹ MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to

take any prerequisites needed to enter MATH 1430G or MATH 1511G first.

² See General Education (p. 220) section of the catalog for a full list of courses.

³ See Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Three credits can be taken inside the College of ACES, but three credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of ACES.

⁴ Off campus students can take FWCE 1120 Contemporary Issues in Wildlife and Natural Resources Management Distance Education.

⁵ At least one course chosen must be a vertebrate taxonomy course with FWCE prefix, i.e., one of FWCE 467 Herpetology or FWCE 482 Ichthyology.

⁶ Wildlife Concentration Electives (any course for 3-4 credits from the Techniques, Management or Organismal Biology areas):

Techniques

- FWCE 355 Wildlife Techniques and Analysis

Management

- FWCE 437 Wildlife Damage Management
- FWCE 447 Wildlife Law and Policy
- RGSC 325 Rangeland Restoration Ecology

Organismal Biology

- BIOL 484 Animal Communication
- EPWS 303 Economic Entomology
- EPWS 462 Parasitology
- FWCE 430 Avian Field Ecology
- FWCE 431 Mammalogy
- FWCE 467 Herpetology

⁷ Students intending to pursue graduate studies should also take CHEM 2115 Survey of Organic Chemistry and Laboratory.

⁸ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Additional Electives

Take additional credits so the total adds up to at least 120 credits including 55 credits 300- and 400-level classes.

Students are encouraged to pursue a minor course of study with a department of their choosing.

Compatible minors include, but are not limited to:

- animal science,
- biology,
- chemistry,
- environmental science,
- forensic sciences,
- geography,
- journalism,

- management,
- and range science.

Notes:

1. No more than 6 credits of Physical Education classes will count towards your degree.
2. Maximum of two grades of 'D' in FWCE classes will count towards a student's degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
MATH 1430G	Applications of Calculus I ¹	3
ENGL 1110G	Composition I ¹	4
FWCE 1110G	Introduction to Natural Resources Management	4
ACES 1120	Freshman Orientation	1
Area V: Humanities Course ²		3
Credits		15

Semester 2

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	4
FWCE 2110	Principles of Fish and Wildlife Management	3
Choose from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
Area VI: Creative and Fine Arts ²		3
Choose from one of the following:		3
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Credits		16

Second Year

Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
CHEM 1121	General Supplemental Instruction I	1
FWCE 301	Wildlife Ecology	3
PHYS 1115G	Survey of Physics with Lab	4
Elective Course		3
Credits		15

Semester 2

CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
CHEM 1122	General Supplemental Instruction II	1
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4

BIOL 313	Structure and Function of Plants	3
Choose from one of the following:		3-4
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
RGSC 318	Watershed Management	

Credits **15-16**

Third Year**Semester 1**

ENGL 2210G	Professional & Technical Communication	3
BIOL 322	Zoology (Fall Only) ¹	3
A ST 311	Statistical Applications ¹	3
VWW: Viewing a Wider World Course ³		3
Choose from one of the following:		4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory ¹	
GEOL 1110G	Physical Geology ¹	

Credits **16**

Semester 2

FWCE 330	Natural History of the Vertebrates (Spring Only) ¹	4
FWCE 357	Fisheries Management and Analysis (Spring Only in Even Years) ¹	4
Choose from one of the following:		4
BIOL 465	Invertebrate Zoology	
EPWS 462	Parasitology	
FWCE 467	Herpetology ¹	
FWCE 482	Ichthyology ¹	
Elective Course		2

Credits **14**

Fourth Year**Semester 1**

FWCE 391	Internship (Fall Only must be taken with FWCE 393) ¹	1
FWCE 393	Professional Experience and Communication (Fall Only Must be taken with FWCE 391) ¹	3
BIOL 312	Plant Taxonomy (Fall Only) ¹	3
FWCE 457	Ecological Biometry (Fall Only in Odd Years) ¹	3
FWCE 402	Seminar in Natural Resource Management	1
Choose from one of the following:		3
BIOL 305	Principles of Genetics ¹	
AGRO 305	Principles of Genetics ¹	
Elective Course		1

Credits **15**

Semester 2

FWCE 409	Introduction to Population Ecology (Spring Only)	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems (Spring Only) ¹	3
BIOL 314	Plant Physiology (Spring Only) ¹	3
Choose from one of the following:		4
ANSC 370	Anatomy and Physiology of Farm Animals ¹	
BIOL 314	Plant Physiology ¹	
BIOL 381	Animal Physiology ¹	
Elective Course		1

Credits **14**

Total Credits **120-121**

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Three credits can be taken inside the College of ACES, but three credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of ACES.

Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology

The Department of Fish, Wildlife and Conservation Ecology prepares you for careers in a variety of natural resource fields related to the management of wild animal populations and the natural systems they share.

To graduate, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU. In addition, each required course must be passed with a grade of C- or better. The department offers a minor in Fish, Wildlife and Conservation Ecology for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

The Wildlife Ecology and Management Concentration is for students who plan to focus on terrestrial organisms.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1430G	Applications of Calculus I ¹	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
ECON 2110G	Macroeconomic Principles	

or ECON 2120G Principles of Microeconomics		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Select one from the following:		
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
<i>Viewing a Wider World</i> ³		3
The second VWV requirement (3 credits) may be filled with the 9-credit hour rule. Please see your advisor for more information.		
Departmental/College Requirements		
<i>Departmental Core Courses (29 credits)</i>		
FWCE 1110G	Introduction to Natural Resources Management ⁴	4
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 391	Internship	1
FWCE 393	Professional Experience and Communication	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 457	Ecological Biometry	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	3
<i>Departmental Botany Requirements (9 credits)</i>		
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
Select one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
<i>Departmental Physiology Requirements (3-4 credits)</i>		
Select 3-4 credits from the following:		3-4
ANSC 370	Anatomy and Physiology of Farm Animals	
BIOL 314	Plant Physiology	
BIOL 381	Animal Physiology	
FWCE 432	Environmental Biology of Fishes	
<i>Concentration Coursework</i>		
<i>Techniques</i>		
FWCE 355	Wildlife Techniques and Analysis	4
<i>Management</i>		
Choose one from the following:		3-4
FWCE 437	Wildlife Damage Management	
FWCE 447	Wildlife Law and Policy	
RGSC 325	Rangeland Restoration Ecology	
<i>Organismal Biology</i>		
Choose one from the following: ⁵		3-4

BIOL 484	Animal Communication	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
<i>Aquatic Ecology and Management Electives</i> ⁶		3-4
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁷		
AGRO 305	Principles of Genetics	3
or BIOL 305	Principles of Genetics	
A ST 311	Statistical Applications	3
BIOL 322	Zoology	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Select one from the following:		4
GEOL 1110G	Physical Geology	
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁸		4-9
Total Credits		120

¹ MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G or MATH 1511G first.

² See General Education (p. 220) section of the catalog for a full list of courses.

³ See Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Three credits can be taken inside the College of ACES, but three credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of ACES.

⁴ Off campus students can take FWCE 1120 Contemporary Issues in Wildlife and Natural Resources Management Distance Education.

⁵ At least one course chosen must be a vertebrate taxonomy course with FWCE prefix, i.e., one of FWCE 467 Herpetology or FWCE 482 Ichthyology.

⁶ Aquatic Concentration Electives, at least one course chosen must be a vertebrate taxonomy course with FWCE prefix (i.e., one of FWCE 430 Avian Field Ecology, FWCE 431 Mammalogy, or FWCE 467 Herpetology)

⁷ Students intending to pursue graduate studies should also take CHEM 2115 Survey of Organic Chemistry and Laboratory.

⁸ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Additional Electives

Take additional credits so the total adds up to at least 120 credits including 55 credits 300- and 400-level classes.

Students are encouraged to pursue a minor course of study with a department of their choosing.

Compatible minors include, but are not limited to:

- animal science,
- biology,
- chemistry,
- environmental science,
- forensic sciences,
- geography,
- journalism,
- management,
- and range science.

Notes:

1. No more than 6 credits of Physical Education classes will count towards your degree.
2. Maximum of two grades of 'D' in FWCE classes will count towards a student's degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
MATH 1430G	Applications of Calculus I ¹	3
ENGL 1110G	Composition I ¹	4
FWCE 1110G	Introduction to Natural Resources Management	4
Area V: Humanities Course ²		3
ACES 1120	Freshman Orientation	1
Credits		15

Semester 2

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	4
FWCE 2110	Principles of Fish and Wildlife Management	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area VI: Creative and Fine Arts Course ²		3
Elective Course		3
Credits		16

Second Year

Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
CHEM 1121	General Supplemental Instruction I	1
Choose from one of the following:		3
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	

PHYS 1115G	Survey of Physics with Lab	4
FWCE 301	Wildlife Ecology ¹	3
Credits		15
Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
CHEM 1122	General Supplemental Instruction II	1
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 313	Structure and Function of Plants (Spring Only)	3
Choose from one of the following:		3
FWCE 437	Wildlife Damage Management	
FWCE 447	Wildlife Law and Policy	
RGSC 325	Rangeland Restoration Ecology	
Credits		15
Third Year		
Semester 1		
ENGL 2210G	Professional & Technical Communication	3
BIOL 322	Zoology (Fall Only) ¹	3
A ST 311	Statistical Applications ¹	3
VWW: Viewing a Wider World Course ³		3
Choose from one of the following:		4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory ¹	
GEOL 1110G	Physical Geology ¹	
Credits		16
Semester 2		
FWCE 330	Natural History of the Vertebrates (Spring Only) ¹	4
FWCE 355	Wildlife Techniques and Analysis (Spring Only in Odd Years) ¹	4
Choose from one of the following:		3-4
BIOL 484	Animal Communication	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology ¹	
FWCE 431	Mammalogy ¹	
FWCE 467	Herpetology ¹	
Elective Course ³		4
Credits		15-16
Fourth Year		
Semester 1		
FWCE 391	Internship (Fall Only Must be taken with FWCE 393) ¹	1
FWCE 393	Professional Experience and Communication (Fall Only Must be taken with FWCE 391) ¹	3
BIOL 312	Plant Taxonomy (Fall Only) ¹	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 457	Ecological Biometry (Fall Only in Odd Years) ¹	3
Choose from one of the following:		3
AGRO 305	Principles of Genetics ¹	
BIOL 305	Principles of Genetics ¹	
Elective Course		1
Credits		15

Semester 2		
FWCE 409	Introduction to Population Ecology (Spring Only)	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems (Spring Only) ¹	3
Elective Course		1
Choose from one of the following:		3
BIOL 314	Plant Physiology ¹	
RGSC 357	Grass Taxonomy and Identification ¹	
RGSC 440	Rangeland Resource Ecology ¹	
Choose one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
Credits		13
Total Credits		120-121

¹ These courses have prerequisites or co-requisites, and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Conservation Ecology - Undergraduate Minor

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. A minor in Conservation Ecology must include a minimum of 20 credits in the discipline with 9 of these coming from upper-division courses.

Requirements

Prefix	Title	Credits
Core Curriculum		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 301 or FWCE 301	Principles of Ecology Wildlife Ecology	3
BIOL 462	Conservation Biology	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 402	Seminar in Natural Resource Management	1
Select 6 credits from the following:		6
BIOL 312 or RGSC 316	Plant Taxonomy Rangeland Plants	
BIOL 313	Structure and Function of Plants	
BIOL 322	Zoology	
BIOL 465	Invertebrate Zoology	
BIOL 467	Evolution	
BIOL 480	Animal Behavior	
BIOL 488	Principles of Conservation Genetics	
ECON 384V	Water Resource Economics	

ECON 337V	Natural Resource Economics
EPWS 303	Economic Entomology
EPWS 462	Parasitology
FWCE 330	Natural History of the Vertebrates
FWCE 409	Introduction to Population Ecology
FWCE 430	Avian Field Ecology
FWCE 431	Mammalogy
FWCE 447	Wildlife Law and Policy
FWCE 464	Management of Aquatic and Terrestrial Ecosystems
FWCE 467	Herpetology
FWCE 482	Ichthyology

Total Credits 20

Wildlife Science - Undergraduate Minor

The Department offers a minor in Wildlife Science for students majoring in other disciplines. The minor consists of a minimum of 18 credit hours.

Prefix	Title	Credits
Required Courses		
FWCE 1110G	Introduction to Natural Resources Management	4
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	3
Total Credits		18

Plant and Environmental Sciences Undergraduate Program Information

The undergraduate program in Plant and Environmental Science prepares you for a variety of careers in agriculture and related fields. Accordingly, a flexible curriculum has been designed that will allow specific programs to be developed in consultation with your academic advisor. Programs may also be developed if you wish to prepare for advanced studies in graduate school. In addition to the courses listed for each major, 35 credits must be taken in the College of Agricultural, Consumer and Environmental Sciences, and the university general education requirements must be met.

The minors require a minimum of 18 credits of which at least 9 hours must be at the 300 or higher level. Specific coursework requirements apply. See advisor for course requirements and scheduling.

Graduate Program Information

More than ever, we are linked in an interconnected world: both in agriculture and sustainability of environmental systems. The department has programs in

- plant sciences,
- environmental science,
- soil science,
- water management,

- natural resources management and
- turf management.

Students trained in these areas are in demand for U.S. and international positions. This demand is at all levels of training—BS, MS, and Ph.D. Therefore, the course work and original research in Plant and Environmental Sciences leading to the Master of Science and Doctor of Philosophy are designed for and have proven to be successful in preparing students for commercial companies, educational institutions, governmental agencies and private production enterprises.

The student may emphasize study in several discipline areas described in the following pages.

- The agronomy section emphasizes sustainable crop production, plant-pest/disease/weed interactions, soil-water-plant relations, crop physiology, and breeding and genetics of cotton, alfalfa, maize and peanuts.
- The genetics section places special emphasis on genetic basis of agronomic or horticultural traits, applied bioinformatics, gene regulation and genomics.
- The environmental and soil science sections emphasize environmental quality and ecosystem services, bioremediation, recycling of organic wastes and wastewater, water use efficiency, soil-plant relations, soil-geomorphology and desert ecology, and the fertility, chemistry, physics, and microbiology of soils, including forest soils.
- The horticulture section emphasizes the creative use of plants by humans, and studies on the technical advancements in the husbandry of most economic commodity groups of fruits, vegetables, or ornamentals as well as managed turf. Emphasis may be in breeding and genetics of chile or onions, plant growth and development, nutrition, dormancy and cold hardiness, plant stress (water and/or salinity) response, fruit and vegetable physiology, forestry, and turfgrass.

Most students will be expected to complete a thesis. The research detailed in a thesis should be of a scope and quality to merit publication in a refereed journal. Depending on prior training and experience, a non-thesis option is available subject to approval by a departmental committee. The non-thesis option requires completion of a research project and paper of limited scope. In both the thesis and non-thesis options, suitability of the research project and resulting thesis or paper will be judged by the student's graduate committee. A minor is recommended and may be taken in chemistry, biology, molecular biology, environmental management, applied statistics, toxicology or other areas.

Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University.

Degrees for the Department Bachelor Degree(s)

- Agronomy - Bachelor of Science in Agriculture (p. 393)
- Environmental Science - Bachelor of Science in Environmental Science (p. 395)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 397)
- Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture (p. 401)
- Horticulture - Bachelor of Science in Agriculture (p. 399)

- Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture (p. 404)
- Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture (p. 406)
- Soil Science (Soils) - Bachelor of Science in Agriculture (p. 408)

Master Degree(s)

- Horticulture - Master of Science (p. 151)
- Plant and Environmental Science - Master of Science (p. 158)

Doctoral Degree(s)

- Plant and Environmental Science - Doctor of Philosophy (p. 198)

Certificate(s)

- Sustainability - Graduate Certificate (p. 210)

Minors for the Department

- Agronomy - Undergraduate Minor (p. 410)
- Environmental Science - Undergraduate Minor (p. 410)
- Genetics and Biotechnology - Undergraduate Minor (p. 410)
- Horticulture - Undergraduate Minor (p. 411)
- Soil Science - Undergraduate Minor (p. 411)

Regents Professor, Rolston St. Hilaire, Department Head

Professors Angadi, Cramer, Guldán, Hanan, Heerema, Idowu, Leinauer, Marsalis, Picchioni, Pratt, Puppala, Ray, Shukla, Ulery, Yao, Zhang;

Associate Professors Burney, Darapuneni, Flynn, Goss, Grover, Holguin, Lombard, Walker; **Assistant Professors** Brungard, Djaman, Ghimire, Giese, Guzman, Lozada, Pietrasiak, Thompson; **College Professors** Lauriault, Stringam; **College Associate Professor** DuBois, Steele; **College Assistant Professors** Gioannini; **Research Associate Professor** Webb; **Research Assistant Professor** Edwards, Rodriguez-Urbe; **Emeritae** O'Connell; Sengupta-Gopalan **Emeritus** Bosland, Mexal, Monger, O'Neill; **Affiliate faculty** Rucker

R. St. Hilaire, Department Head, Ph.D. (Iowa State University)–plant stress physiology and landscape horticulture; S. Angadi, Ph.D. (University of Manitoba, Canada)–crop physiology; W. Boeing, Ph.D. (Louisiana State University)–aquatic ecology; C. Brungard, Ph.D. (Utah State University, Logan)–pedology; O. Burney, Ph.D. (Purdue University, West Lafayette)–silviculture and forest biology; K.C. Carroll, Ph.D. (University of Arizona)–hydrology and water resources; C. S. Cramer, Ph.D. (North Carolina State University)–onion breeding and horticulture; M. Darapuneni, Ph.D. (Texas A&M, College Station)–Agronomy and semi-arid crop rotations; K. Djaman, Ph.D. (University of Nebraska-Lincoln)–soil & water resources and irrigation engineering; D. DuBois, Ph.D. (University of Nevada)–atmospheric science; B. Edwards, Ph.D. (Louisiana State University)–geomorphology, Aeolian processes; R. Flynn, Ph.D. (Auburn University)–soil and water quality; R. Ghimire, Ph.D. (University of Wyoming, Laramie)–soil & crop management; R. Gioannini, M.S. (New Mexico State University)–ornamental horticulture, landscape design; R.M. Goss, Ph.D. (University of Nebraska, Lincoln)–turf science; K. Grover, Ph.D. (Pennsylvania State University)–agronomy; S.J. Guldán, Ph.D. (University of Minnesota)–sustainable agriculture; I. Guzman, Ph.D. (New Mexico State University)–horticulture; N. Hanan, Assistant Department Head, Ph.D. (Queen Mary College, UK)–dryland ecology; R.J. Heerema, Ph.D. (University of California, Davis)–pecans; F.O. Holguin, Ph.D. (New Mexico State University)–biochemical analysis; J. Idowu, Ph.D. (Cranfield University, United Kingdom)–agronomy and land management; B. Leinauer, Ph.D. (Hohenheim University, Germany)–turfgrass;

K. Lombard, Ph.D. (New Mexico State University)–horticulture; D. Lozada Ph.D. (University of Arkansas, Fayetteville)–cell and molecular biology; M. Marsalis, Ph.D. (Texas Tech University)–forages; G.A. Picchioni, Ph.D. (Texas A&M University)–plant-mineral relations; N. Pietrasiak, Ph.D. (University of California, Riverside)–soil and water sciences; R. Pratt, Ph.D. (Purdue University)–plant breeding and genetics; N. Puppala, Ph.D. (New Mexico State University)–plant breeding and genetics; I.M. Ray, Ph.D. (University of Wisconsin-Madison)–alfalfa breeding and genetics; L. Rodriguez-Urbe, Ph.D. (New Mexico State University)–molecular genetics; D. Rucker, Ph.D. (University of Arizona)–hydrogeophysics; M.K. Shukla, Ph.D. (University of Agricultural Sciences Vienna, Austria)–environmental soil physics; B. Stringam, Ph.D. (Utah State University)–biological and agricultural engineering; C. Steele, Ph.D. (King's College, University of London, United Kingdom)–range soils; M. Thompson, Ph.D. (New Mexico State University)–horticulture; A.L. Ulery, Ph.D. (University of California, Riverside)–environmental soil chemistry; S. J. Walker, Ph.D. (New Mexico State University)–horticulture; N. Webb Ph.D. (University of Queensland, Australia)–aeolian process, land degradation processes and rangeland management; S. Yao, Ph.D. (Cornell University)–pomology/horticulture; J. Zhang, Ph.D. (University of Arkansas, Fayetteville)–cotton breeding, genetics, and genomics

Emeritus

P.W. Bosland, Ph.D. (University of Wisconsin, Madison)–chile breeding and genetics; J.G. Mexal, Ph.D. (Colorado State University)–plant physiology; M. O'Neill, Ph.D. (University of Arizona, Tucson)–agronomy and crop physiology; C.H. Monger, Ph.D. (New Mexico State University)–soil genesis and classification

Emeritae

M.A. O'Connell, Ph.D. (Cornell University)–plant biochemistry and molecular genetics; C. Sengupta-Gopalan, Ph.D. (Ohio State University)–biochemical genetics

Agronomy Courses

AGRO 1110G. Introduction to Plant Science (Lecture & Lab) 4 Credits (3+2P)

This is an introductory course for understanding plant science. Basic biological, chemical, and physical principles of various plants are covered. The focus of this course is on plants/crops used in agriculture production of food and fiber as well as pasture and range plants. Plant taxonomy and soil properties will also be discussed. Same as HORT 1115G.

Learning Outcomes

1. Describe the basic structure of plants including growth and function.
2. Define photosynthesis, respiration, and translocation
3. Utilize plant taxonomy techniques to identify various plants.
4. Classify soils based on their chemical and physical properties.
5. Explain how different soil properties affect plant growth and sustainability.

AGRO 2160. Plant Propagation**3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Crosslisted with HORT 2160.

Learning Outcomes

1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, "hands-on" laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

AGRO 2996. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

AGRO 300. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

AGRO 303V. Genetics and Society**3 Credits (3)**

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: GENE 303V.

AGRO 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

AGRO 311. Introduction to Weed Science**4 Credits (4)**

Principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Same EPWS 311.

Prerequisite: CHEM 1215G and BIOL 2110G.

AGRO 315. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 315

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

AGRO 365. Principles of Crop Production**4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Crosslisted with: HORT 365

Prerequisite(s): AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.

AGRO 377. Introduction to Turfgrass Management**4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: HORT 377

AGRO 391. Internship**1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/ U, Audit).

Prerequisite(s): Consent of instructor.

AGRO 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: HORT 447, ENVS 447 and SOIL 447.

AGRO 449. Special Problems**1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

AGRO 450. Special Topics**1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

AGRO 462. Plant Breeding**3 Credits (3)**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

Prerequisite(s): ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

AGRO 471. Plant Mineral Nutrition**3 Credits (3)**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as HORT 471 and EPWS 471. May be repeated up to 3 credits.

Prerequisite/Corequisite: EPWS 314/BIOL 314, or concurrent enrollment, or consent of instructor.

AGRO 483. Sustainable Production of Agronomic Crops**4 Credits (3+2P)**

Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of cereal grain, fiber, forage and oilseed crops.

Corequisite(s): AGRO 365/ HORT 365.

AGRO 492. Diagnosing Plant Disorders**3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and HORT 492.

Prerequisites: EPWS 303 and EPWS 310.

AGRO 500. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

AGRO 505. Research Orientation**4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, SOIL 505 and ENVS 505.

AGRO 511. Introduction to Weed Science (f)**4 Credits (4)**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Same as EPWS 511.

Prerequisites: CHEM 1215G or BIOL 2110G, or consent of instructor.

AGRO 515. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 515

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

AGRO 516. Molecular Analysis of Complex Traits**3 Credits (3)**

Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Same as HORT 516.

Prerequisite: AGRO 305 or consent of instructor.

AGRO 525. Scientific Writing- How to be a Productive and Effective Writer
1-3 Credits (1-3)

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: HORT 525, EPWS 525, SOIL 525, AGRO 625, HORT 625 and SOIL 625.

AGRO 590. Graduate Seminar**1 Credit (1)**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as HORT/ SOIL 590. Crosslisted with: HORT 590 and SOIL 590.

AGRO 595. Internship**1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

AGRO 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: ENVS 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

Prerequisite(s): Master level graduate students.

AGRO 597. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Restricted to: Main campus only. Restricted to Agronomy and Horticulture Graduate Students. Crosslisted with: HORT 597 and SOIL 597

AGRO 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.

AGRO 599. Master's Thesis**15 Credits**

Thesis.

Environmental Science Courses

ENVS 1110G. Environmental Science I**4 Credits (3+2P)**

Introduction to environmental science as related to the protection, remediation, and sustainability of land, air, water, and food resources. Emphasis on the use of the scientific method and critical thinking skills in understanding environmental issues.

Learning Outcomes

1. Students will learn to critically analyze cause-and-effect relationships in the environment
2. Students will integrate and synthesize knowledge and draw appropriate conclusions based on the scientific method

ENVS 2111. Environmental Engineering and Science**3 Credits (3)**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: C E 256

Prerequisite: CHEM 1215G and MATH 1511G or ENGR 190.

Learning Outcomes

1. To understand the nature of water quality parameters in the context of Civil Engineering and Environmental Science (Water Treatment/ Wastewater Treatment/Environmental Science)
2. To learn to apply engineering and scientific solutions to water quality problems
3. To understand environmental regulations and their consequences on the design of pollution control systems

ENVS 2111L. Environmental Science Laboratory**1 Credit (1)**

Laboratory experiments associated with the material presented in ENVS 2111. Same as C E 256 L.

Corequisite(s): ENVS 2111.

Learning Outcomes

1. List typical analyses commonly performed to evaluate physical, chemical, and microbiological parameters used to describe water quality.
2. Follow experimental procedures listed in the class laboratory manual, or other publications such as Standards Methods, to perform common water quality analyses.
3. Evaluate, analyze, and discuss experimental results and present the conclusions in the form of a professional report

ENVS 300. Special Topics**1-4 Credits**

Special subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester. Restricted to majors.

ENVS 301. Principles of Ecology**3 Credits (3)**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. Crosslisted with: BIOL 301

Prerequisite(s): BIOL 2610G, A ST 311, and grade of C or better in MATH 1511G or Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1511G.

ENVS 312. Emergency Response to Hazardous Material Incidents**2 Credits (2)**

EPA approved Environmental Response Training Program Course 165.15. In compliance with OSHA 29 CFR 1910.120. Normally taken during last year of study. Same as E T 312 and WERC 312.

Prerequisite: consent of instructor.

ENVS 361. Basic Toxicology**3 Credits (3)**

Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended. Crosslisted with: TOX 361. May be repeated up to 3 credits.

Prerequisite: CHEM 1120G or CHEM 1225G and BIOL 2610G or BIOL 2110G.

Learning Outcomes

1. Learn how toxins are absorbed, distributed, metabolized, and excreted from living systems.
2. Demonstrate how metabolism can appreciably alter the toxicity of compounds as well as dictate the resultant toxicity with an emphasis on target organ(s).
3. Explain the specific mechanism(s) of actions of toxins targeting the liver, lung, kidney, and nervous systems.
4. Delineate how certain toxins induce cancer and/or promote the development of cancer.
5. Understand how and why certain plants and animals are poisonous and venomous, specifically linking discrete chemicals or complex mixtures to the resultant toxic manifestation.

ENVS 370. Environmental Soil Science**3 Credits (3)**

Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as SOIL 370.

Prerequisite: SOIL 2110.

ENVS 391. Internship**3 Credits (3)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

ENVS 422. Environmental Chemistry**3 Credits (3)**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation. Restricted to: Main campus only. Crosslisted with: CHEM 422

Prerequisite(s): CHEM 1225G and either CHEM 2115 or CHEM 313.

ENVS 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and SOIL 447.

ENVS 449. Special Problems**1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E S majors.

ENVS 451. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

ENVS 452. Geohydrology**4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: C E 452 and GEOL 452.

ENVS 457. Water Measurement**3 Credits (3)**

The fundamentals of measuring water will be covered. Participants will learn about measurement techniques that are used to estimate evapotranspiration as well as commonly used water measurement structures to estimate water use. The benefits and problems that are associated with using each measurement will be discussed. Students will also learn about the principles of how to use water measurement as a management tool.

Prerequisite(s): MATH 1215 or higher, or consent of Instructor.

ENVS 460. Introduction to Air Pollution**3 Credits (3)**

An introduction to the physics and chemistry of tropospheric air pollution including sources of air pollution, local and long-range transport, instrumentation, regulatory requirements, control technology.

Prerequisite(s): PHYS 1310G, CHEM 1225G, MATH 1511G.

ENVS 462. Sampling and Analysis of Environmental Contaminants
3 Credits (1+6P)

Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Same as ENVE 462.

Prerequisites: ENVS 2111.

ENVS 470. Environmental Impacts of Land Use and Contaminant Remediation
3 Credits (3)

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: WSAM 470.

Prerequisite(s): ENVS 2111, ENVS 370, ENVS 452, ENVS 462.

ENVS 471. Water Quality and Geochemistry
3 Credits (3)

We will cover the connection of water chemistry with water quality and apply geochemical modeling to practical problems. Discussions of assessment methodologies will be supported with case studies. The focus of this course is on team-based project learning. Computer software and models (mainly PHREEQC from USGS) will be used to learn analysis techniques.

Prerequisite(s): ENVS 370 or ENVS 452 or consent of instructor.

ENVS 505. Research Orientation
4 Credits (4)

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, HORT 505 and SOIL 505.

ENVS 557. Water Measurement
3 Credits (3)

The fundamentals of measuring water will be covered. Participants will learn about measurement techniques that are used to estimate evapotranspiration as well as commonly used water measurement structures to estimate water use. The benefits and problems that are associated with using each measurement will be discussed. Students will also learn about the principles of how to use water measurement as a management tool.

ENVS 596. Masters Proposal
1 Credit (1)

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

Prerequisite(s): Master level graduate students.

ENVS 599. Master's Thesis
1-15 Credits

Thesis Graded: Thesis/Disertation.

Genetics Courses

GENE 1110. Experimental Systems in Genetics
1 Credit (1)

Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.

Learning Outcomes

1. To give the students a historical perspective on the field of genetics.
2. To familiarize the students to introductory concepts and vocabulary to the field of genetics.
3. Introduce experimental systems within the field of genetics and to give perspective to current genetic research.
4. As this course is designed for beginning students as an overview of faculty and research labs on campus. The students majoring in genetics are encouraged to meet with faculty and to explore opportunities available to them on campus

GENE 305. Principles of Genetics
3 Credits (3)

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

GENE 305 L. Genetic Techniques
1 Credit (3P)

Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics.

Prerequisite(s)/Corequisite(s): GENE 315, or AGRO/ANSC/BIOL/HORT 305.

GENE 315. Molecular Genetics
3 Credits (3)

Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics. Recommend CHEM 313.

Prerequisite(s): CHEM 1225G and BIOL 2110G.

GENE 320. Hereditary and Population Genetics
3 Credits (3)

Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.

Prerequisite(s): CHEM 1215G & BIOL 2110G.

GENE 391. Genetics Internship**1-6 Credits (1-6)**

Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

GENE 440. Genetics Seminar**1 Credit (1)**

Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology. Consent of instructor required.

Prerequisite(s): Seniors only; GENE 315 & GENE 320.

GENE 449. Special Problems**1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

GENE 450. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

GENE 452. Applied Bioinformatics**3 Credits (3)**

Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.

GENE 486. Genes and Genomes**3 Credits (3)**

Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

GENE 488. Gene Regulation**3 Credits (3)**

Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315.

Horticulture Courses

HORT 1115G. Introductory Plant Science**4 Credits (3+2P)**

Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 1110G.

Learning Outcomes

1. Describe the role plants play in everyday lives
2. Introduce career opportunities in plant and soil sciences, and related fields
3. Define plants through the concepts of plant structure and anatomy
4. Introduce the wide variety of plants cultivated throughout the world
5. Describe how plants work (growth, reproduction, physiology, and soil)
6. Describe how plants are manipulated to feed, clothe and entertain the world

HORT 2110. Ornamental Plants I**4 Credits (2+3P)**

Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.

Learning Outcomes

1. Given 35 ornamental plants selected from the course's plant list, 100% of students will be expected to correctly identify the genus, species, and common names of the plants with 70% accuracy.
2. Given plants selected from the course's plant list, 100% students will be expected to identify to landscape use of those plants with 85% accuracy.

HORT 2120. Ornamental Plants II**4 Credits (2+3P)**

Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.

Learning Outcomes

1. Given 35 ornamental plants selected from the course's plant list, 100% of students will be expected to correctly identify the genus, species, and common names of the plants with 70% accuracy.
2. Given plants selected from the course's plant list, 100% students will be expected to identify to landscape use of those plants with 85% accuracy.

HORT 2130. Floral Quality Evaluation and Design**2 Credits (1+2P)**

Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.

Learning Outcomes

1. Identify common floriculture crops, or know resourcing to help identify the crop.
2. Evaluate quality (merit and fault) of common floriculture crops, based on industry standards and merit. Pi Alpha Xi and American Floral Endowment standards will be used for the purpose of this class.
3. Have a basic understanding of the floriculture industry, and identify career pathways within the industry.
4. Know, understand, creatively interpret, and execute basic principles of design in regards to floral design.
5. Use interpersonal communication, problem solving, basic math, and marketing during cash and carry "lab" time (flower sales) in developing job ready skills in floristry.
6. Layer principles of design, marketing, sales, and time management to create floral art in real-world scenarios.

HORT 2160. Plant Propagation**3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 2160.

Learning Outcomes

1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, "hands-on" laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

HORT 2990. Floriculture Field Practicum**1 Credit (1)**

Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.

Prerequisite(s): HORT 2130 or consent of instructor.

Learning Outcomes

1. Varies

HORT 2996. Special Topics**1-4 Credits**

Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

HORT 300. Special Topics**1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

HORT 302V. Forestry and Society**3 Credits (3)**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.

HORT 304. Hydroponics**4 Credits (4)**

This course will introduce students to the basics of the different soil-less growing systems: hydroponics, aeroponics and aquaponics. Topics will include growing systems and environments, crop management, business aspects of hydroponic growing, integrated pest management, commercial and restaurant systems, and plant nutrition. Labs will reinforce lecture topics and give students practical experience growing different types of crops in different types of systems.

Learning Outcomes

1. Discuss the benefits and constraints of different hydroponic systems; evaluate different crops for each type of system;
2. Identify the components and calculate costs of different systems; demonstrate how to build and maintain each type of system;
3. Discuss how soilless growing relates to sustainability and local food production

HORT 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

HORT 307. Landscape Design**3 Credits (2+3P)**

Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques. Prerequisites : HORT 2110 or HORT 2120 or concurrent enrollment or consent of instructor.

HORT 310. Medicinal Herbs**3 Credits (3)**

Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.

HORT 315. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 315

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

HORT 318V. Urban Water Issues and Society**3 Credits (3)**

Global study of water science, development, law, and use for agriculture, manufacturing, landscaping, home use, and other urban uses. This course allows students to become familiar with important issues concerning the interaction between water use and humans. Topics include the water cycle, water chemistry, human-water relations, plant-water relations, water users, water-dependent population placement and growth, water regulation, and the future of water.

Learning Outcomes

1. Define and describe Earth's water sources and the water cycle.
2. Describe the chemical processes associated with water and analyze the composition of several water sources.
3. Summarize the interactions of water with the human body.
4. Explain the use of water in agricultural and other plants on both a regional scale and cellular level.
5. Identify, explain, and compare all water users and categorize their demand and availability for water.
6. Analyze the interconnection of the human societies and water while discussing locations of civilizations and communities.
7. Analyze, from a historical perspective, the interrelationships of all water users and all water decision makers. Describe the history of US and world water regulation and analyze its success rate.
8. Predict and recommend how water will be used and distributed in the future.

HORT 365. Principles of Crop Production**4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Crosslisted with: AGRO 365

Prerequisite(s): AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.

HORT 377. Introduction to Turfgrass Management**4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease insects and turfgrass varieties. Crosslisted with: AGRO 377

HORT 378. Turfgrass Science**4 Credits (3+3P)**

Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology.

Prerequisite(s): HORT 377 or consent of instructor.

HORT 391. Internship**1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

HORT 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, ENVS 447 and SOIL 447.

HORT 449. Special Problems**1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

HORT 450. Special Topics**1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

HORT 462. Plant Breeding**3 Credits (3)**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

Prerequisite(s): ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

HORT 471. Plant Mineral Nutrition**3 Credits (3)**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471. May be repeated up to 3 credits.

Prerequisite/Corequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

HORT 479. Advanced Turfgrass Science**3 Credits (3)**

Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.

Prerequisite: HORT 378 or consent of instructor.

HORT 485. Vegetable Crop Management**4 Credits (3+2P)**

Physiological, environmental and cultural aspects of vegetable crop production. Corequisite(s): AGRO 365/HORT 365

HORT 488. Greenhouse Management**4 Credits (3+3P)**

Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.

Prerequisite(s): HORT/AGRO 365 or consent of instructor.

HORT 492. Diagnosing Plant Disorders**3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.

Prerequisites: EPWS 303 and EPWS 310.

HORT 500. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

HORT 505. Research Orientation**4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, SOIL 505 and ENVS 505.

HORT 515. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 515

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

HORT 525. Scientific Writing How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

HORT 590. Graduate Seminar**1 Credit (1)**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

HORT 595. Internship**1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

HORT 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

Prerequisite(s): Master level graduate students.

HORT 597. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and SOIL 597

HORT 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

Prerequisite: consent of instructor.

HORT 599. Master's Thesis**15 Credits**

Thesis.

Soil Courses

SOIL 2110. Introduction to Soil Science**3 Credits (3)**

An overview of fundamental concepts in soil science and soils as a natural resource. Students will be introduced to the physical, chemical, and biological properties as it relates to soil management in environmental science, conservation, and agronomy. May be repeated up to 3 credits.

Prerequisite: (CHEM 1120G and MATH 1215 or higher) or CHEM 1215G.

Learning Outcomes

1. Understand and use the technical terminology associated with the use and management of soils.
2. Understand the classification of soils and the processes leading to their formation.
3. Identify key physical, chemical, and biological properties of soils.
4. Explain the impact of land use and management decisions as it relates to soil degradation and environmental problems.

SOIL 2110L. Introduction to Soil Science Laboratory**1 Credit (1)**

Morphological, chemical, physical and biological properties of soil in the laboratory and field.

Corequisite(s): SOIL 2110.

Learning Outcomes

1. Learn techniques for sampling and characterizing soils in the region.
2. Understand how soils are formed and the processes that occur within the soil profile.
3. Gain fundamental knowledge on soil physical, chemical, and biological properties and how each can influence the overall function of a particular soil.
4. Develop critical thinking and analytical skills within laboratory and field settings.
5. Encourage collaboration, inclusiveness and critical thinking.

SOIL 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

SOIL 300. Special Topics**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

SOIL 312. Soil Management and Fertility**3 Credits (3)**

Management, conservation, and fertility of soils; physical conditions affecting growth, nutrition, and plant production.

Prerequisite(s): SOIL 2110.

Corequisite(s): SOIL 312L.

SOIL 312 L. Soil Management and Fertility Lab**1 Credit (1)**

Hands-on experience. Includes field trips, videos, calculations, visiting lecturers and other lab activities as possible.

Prerequisite(s): SOIL 2110.

Corequisite(s): SOIL 312.

SOIL 370. Environmental Soil Science**3 Credits (3)**

Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as ENVS 370.

Prerequisite: SOIL 2110.

SOIL 391. Internship**1-6 Credits (1-6)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

SOIL 424. Soil Chemistry**3 Credits (3)**

Basic elements of soil chemistry including clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

Prerequisite(s): SOIL 2110L or CHEM 1215G and CHEM 1225G.

SOIL 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and ENVS 447.

SOIL 449. Special Problems**1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

SOIL 450. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree. May be repeated up to 9 credits. Consent of Instructor required.

SOIL 456. Irrigation and Drainage**3 Credits (3)**

Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.

SOIL 472. Soil Morphology and Classification**4 Credits (2+2P)**

Same as SOIL 472. Crosslisted with: SOIL 472.

SOIL 476. Soil Microbiology**3 Credits (3)**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as BIOL 476.

SOIL 476 L. Soil Microbiology Laboratory**1 Credit (3P)**

Enumeration of soil microorganisms, their activities, and transformations they mediate. May be repeated up to 1 credit.

Corequisite: SOIL 476.

Learning Outcomes

1. Collect, store, and characterize soil samples using appropriate and sterile techniques of soil microbiology.
2. Observe, describe, and recognize major groups of microbial organisms
3. Develop skills in basic microscopy, isolation and culturing of soil microbes
4. Acquire basic DNA-based molecular skills in soil microbiology.
5. Compare and evaluate soil samples from different microhabitats regarding their soil microbiota.
6. Apply the scientific method including the following steps: developing a research question, constructing a testable hypothesis, design a research study to test the hypothesis, perform the experiment and collect data, analyze the results, evaluate the results and support/reject the hypothesis, and report the results.

SOIL 477. Environmental Soil Physics**3 Credits (3)**

A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.

SOIL 477 L. Environmental Soil Physics Laboratory**1 Credit (1)**

Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity.

Prerequisite(s): SOIL 2110.

SOIL 479. Environmental Soil Chemistry**3 Credits (3)**

Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

Prerequisite(s): SOIL 2110L or CHEM 1215G and CHEM 1225G.

SOIL 500. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

SOIL 505. Research Orientation**4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, AGRO 505 and ENVS 505.

SOIL 525. Scientific Writing- How to be a Productive and Effective Writer
1-3 Credits (1-3)

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, HORT 525, HORT 625, SOIL 625 and EPWS 525.

SOIL 590. Graduate Seminar**1 Credit (1)**

Current research discussions presented by master level graduate students. Not more than one credit toward the degree. Same as AGRO/HORT 590. Crosslisted with: AGRO 590 and HORT 590.

SOIL 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and HORT 596. Students must be a Master level graduate student to enroll in this course. Restricted to: Masters HORT; Masters PLEN majors.

SOIL 597. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and HORT 597

SOIL 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

SOIL 625. Scientific Writing- How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive.

Office Location: Skeen Hall room N127

Phone: (575) 646-3405

Website: <http://aces.nmsu.edu/academics/pes/>

Agronomy - Bachelor of Science in Agriculture

Agronomy is an understanding of the principles of plant and soil science and an application of these principles in the production of crops. Commercial sector careers include positions in agricultural consulting companies, agricultural seed or chemical companies, research and development with commercial companies, as well as farm and/or ranch management. Careers in county, state or federal agencies are in the areas of USDA, Cooperative Extension Service, Natural Resources Conservation Service, Forest Service and Bureau of Land Management.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
	<i>English Composition - Level 1</i> ¹	4
	<i>English Composition - Level 2</i>	

Choose from one of the following: 3

ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	

*Oral Communication*¹ 3

Area II: Mathematics

Choose from one of the following: 3

MATH 1220G	College Algebra	
MATH 1430G	Applications of Calculus I	

Area III/IV: Laboratory Science and Social/Behavioral Sciences 11

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	

*Area IV: Social & Behavioral Sciences Course (3 credits)*¹

*Area V: Humanities*¹ 3

*Area VI: Creative and Fine Arts*¹ 3

General Education Elective

AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
or HORT 1115G	Introductory Plant Science	

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Departmental/College Requirements

AEEC 2140	Technology and Communication for Business Management	3
AGRO 305	Principles of Genetics (or GENE 320 AND EPWS 301)	3
AGRO 311	Introduction to Weed Science	4
AGRO 365	Principles of Crop Production	4
AGRO 447	Seminar	1
AGRO 449	Special Problems	1-3
AGRO 462	Plant Breeding	3
AGRO 471	Plant Mineral Nutrition	3
AGRO 483	Advanced Sustainable Crop Production	4
or HORT 485	Vegetable Crop Management	
AGRO 492	Diagnosing Plant Disorders	3
EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4
EPWS 314	Plant Physiology	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1

Other Required Courses

Choose 10 credits from the following: 10

AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 305	Marketing and Food Agricultural Products	
AEEC 315V	World Agriculture and Food Problems	
AGRO 2160	Plant Propagation	
AGRO 391	Internship	
BIOL 312	Plant Taxonomy	
EPWS 303	Economic Entomology	
BLAW 316	Legal Environment of Business	
EPWS 301	Agricultural Biotechnology	
EPWS 373	Fungal Biology	
EPWS 455	Advanced Integrated Pest Management	

HORT 315	Crop Physiology	
RGSC 2110	Introduction to Rangeland Management	
SOIL 456	Irrigation and Drainage	
SPAN 1110	Spanish I	
SPAN 1120	Spanish II	
SPAN 2110	Spanish III	
Non- Departmental Requirements (other than Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 313	Structure and Function of Plants	3
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
Electives, to bring the total credits to 120 ³		5-7
Total Credits		120

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
or MATH 1430G	or Applications of Calculus I	
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
or HORT 1115G	or Introductory Plant Science	
Area IV: Social and Behavioral Science Course ²		3
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits		
Credits		14
Semester 2		
ENGL 2210G	Professional & Technical Communication ¹	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
CHEM 1121	General Supplemental Instruction I	1
Area V: Humanities Course ²		3
AEEC 2140	Technology and Communication for Business Management	3

BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution ¹	3
Credits		17
Second Year		
Semester 1		
ACOM 1130G	Effective Leadership and Communication in Agriculture ¹	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory ¹	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Area VI: Creative and Fine Arts Course ²		3
Credits		17
Semester 2		
AGRO 305	Principles of Genetics ¹	3
CHEM 2115	Survey of Organic Chemistry and Laboratory ¹	4
BIOL 313	Structure and Function of Plants ¹	3
A ST 311	Statistical Applications ¹	3
EPWS 303	Economic Entomology (Spring Only) ¹	3
Credits		16
Third Year		
Semester 1		
AGRO 365	Principles of Crop Production (Fall Only) ¹	4
EPWS 310	Plant Pathology (Fall Only) ¹	4
AGRO 311	Introduction to Weed Science (Fall Only) ¹	4
AGRO Option Course ⁴		3
VWW: Viewing a Wider World Course ³		3
Credits		18
Semester 2		
SOIL 312	Soil Management and Fertility (Spring Only) ¹	3
SOIL 312 L	Soil Management and Fertility Lab	1
EPWS 314	Plant Physiology (Spring Only) ¹	3
AGRO Option Course ⁴		3
AGRO Option Course ⁴		3
VWW: Viewing a Wider World Course ³		3
Credits		16
Fourth Year		
Semester 1		
AGRO 492	Diagnosing Plant Disorders (Fall Only) ¹	3
AGRO 449	Special Problems	1-3
AGRO 462	Plant Breeding (Fall Only) ¹	3
AGRO 483 or HORT 485	Advanced Sustainable Crop Production (Spring Only) ¹ or Vegetable Crop Management	4
AGRO Option Course ⁴		3
Credits		14-16
Semester 2		
AGRO 447	Seminar (Spring Only)	1
AGRO 471	Plant Mineral Nutrition (Spring Only) ¹	3
Elective Course		3
Elective Course		1
Credits		8
Total Credits		120-122

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Consult with your departmental advisor.

Environmental Science - Bachelor of Science in Environmental Science

The environmental science major is a multidisciplinary program based on a strong general science curriculum and an environmental curriculum that focuses on environmental problems and solutions. Although administered by the Department of Plant and Environmental Sciences, a multidisciplinary advisory committee recommends curriculum and other changes to the program. Graduates are very competitive for careers in industry and government and have excellent preparation for graduate programs in a variety of fields. A grade of C- or better must be earned in the Basic Background and Core Requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>11</i>
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social & Behavioral Sciences Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		<i>3</i>
<i>Area VI: Creative and Fine Arts</i> ¹		<i>3</i>
<i>General Education Elective</i> ³		
GEOL 1110G	Physical Geology	4
Viewing A Wider World ⁴		6
Departmental/College Requirements		
<i>Basic Science and Math Requirements (43 credits including Area III and General Education Elective above)</i>		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (note: BIOL 2610L is NOT required for ES major)	3
BIOL 311	General Microbiology	3
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
A ST 311	Statistical Applications	3
MATH 1521G or MATH 1430G	Calculus and Analytic Geometry II Applications of Calculus I	4

PHYS 1310G	Calculus-Based Physics I (note: the lab is NOT required for ES major)	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
<i>Environmental Science Core Requirements</i>		
ENVS 1110G	Environmental Science I	4
ENVS 2111 & 2111L	Environmental Engineering and Science and Environmental Science Laboratory	4
ENVS 301	Principles of Ecology	3
ENVS 312	Emergency Response to Hazardous Material Incidents	2
ENVS 361	Basic Toxicology	3
ENVS 370	Environmental Soil Science	3
ENVS 391	Internship	3
ENVS 422	Environmental Chemistry	3
ENVS 452	Geohydrology	4
ENVS 460	Introduction to Air Pollution	3
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
GEOG 481	Fundamentals of Geographic Information Science (GIS) (any GIS course)	4
Select from one of the following:		4
ENVS 457	Water Measurement	
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		6
Total Credits		120

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites first.

³ MATH 1511G, ENVS 1110G, and GEOL 1110G are all required for this major and will satisfy this category depending on which course is completed first.

⁴ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses; one course may be in the College of ACES but cannot be taught or cross-listed with AGRO, HORT, ENVS, SOIL, or GENE.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Students should meet with their advisor every semester.

First Year

Semester 1		Credits
ENVS 1110G	Environmental Science I (C or better)	4
ENGL 1110G	Composition I (C or better) ¹	4
Choose from one of the following: ²		3
Area IV: Social and Behavioral Science Course (C or better) ²		
Area V: Humanities Course (C or better) ²		
Area VI: Creative and Fine Arts Course (C or better) ²		
Elective Course ³		3
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits ³		
Credits		14

Semester 2

Elective Course ³		3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication (C- or better)	
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
GEOL 1110G	Physical Geology (C or better)	4
Choose from one of the following:		3
Area IV: Social Behavioral Course (C or better) ²		
Area V: Humanities Course (C or better) ²		
Area V: Creative and Fine Arts Course (C or better) ²		
Credits		16

Second Year

Semester 1		
MATH 1511G	Calculus and Analytic Geometry I (C or better) ¹	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C or better)	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required (C or better))	3
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication (C or better)	
ENGL 2215G	Advanced Technical and Professional Communication (C or better)	
Choose one from the following:		4
ENVS 457	Water Measurement	
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits ³		
Credits		18

Semester 2

MATH 1521G or MATH 1430G	Calculus and Analytic Geometry II (C or better in either) ¹ or Applications of Calculus I	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C or better) ¹	4
Choose from one of the following:		3
Area IV: Social and Behavioral Science Course ²		
Area V: Humanities Course ²		
Area VI: Creative and Fine Arts ²		
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits ³		
Credits		11

Third Year

Semester 1		
A ST 311	Statistical Applications (C or better) ¹	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory (C or better)	4
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
VWW: Viewing a Wider World Course	(C or better) ⁴	3
Credits		18

Semester 2

ENVS 312	Emergency Response to Hazardous Material Incidents (Spring Only) (C or better)	2
ENVS 2111 & 2111L	Environmental Engineering and Science and Environmental Science Laboratory (C or better)	4
ENVS 370	Environmental Soil Science (Spring Only) (C or better)	3
PHYS 1310G	Calculus -Based Physics I (lab not required)	3
Credits		12

Fourth Year

Semester 1		
ENVS 462	Sampling and Analysis of Environmental Contaminants (Fall Only) (C or better)	3
ENVS 452	Geohydrology (Fall Only) (C or better)	4
ENVS 460	Introduction to Air Pollution (Fall Only) (C or better)	3
ENVS 361	Basic Toxicology (Fall Only) (C or better)	3
ENVS 422	Environmental Chemistry (Fall Only) (C or better)	3
Credits		16

Semester 2

ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation (Spring Only) (C or better)	3
ENVS 301	Principles of Ecology (C or better)	3
ENVS 391	Internship (C or better)	3
VWW: Viewing a Wider World Course	(C or better) ⁴	3
BIOL 311	General Microbiology	3
Credits		15
Total Credits		120

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ The department recommends utilizing the following courses to fulfill the additional elective credits needed for Financial Aid requirements.

First Year - Semester 1:

- MATH 1220G College Algebra
- ACES 1120 Freshman Orientation

First Year - Semester 2:

- MATH 1250G Trigonometry & Pre-Calculus

Second Year - Semester 1:

- CHEM 1121 General Supplemental Instruction I

Second Year - Semester 2:

- CHEM 1122 General Supplemental Instruction II

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Genetics and Biotechnology - Bachelor of Science in Genetics

Codirectors of the Program:

Professor, Charles Shuster, Department Head, Biology

Professor, Rolston St. Hilaire, Department Head, Plant and Environmental Sciences

Professors Bailey, Cramer, Hanley, Houde, Milligan, Nishiguchi, Ray, St. Hilaire, Serrano, C. Shuster, M. Shuster, Smith, Unguez, Zhang; **Associate Professors** Curtiss, James, Xu **Assistant Professors** Indriolo

Have you ever wondered why your hair or eye color, facial features, or the build of your body resembles that of your parents, grandparents, or other close relatives? What factors are responsible for generating all the variety of colors and shapes of flowers, trees, and different types of animals? If these questions have crossed your mind, then you have been thinking about Genetics; the science of heredity. Genetics is studied at the DNA/gene/genome level (molecular genetics, biotechnology, genomics and bioinformatics), the level of organisms (classical or Mendelian genetics), and within/among populations of individuals (population and quantitative genetics).

One of the most significant scientific accomplishments in history has been the use of genomic technologies to recently identify most human genes, as well as, most genes for a number of other animals, plants, fungi, and bacteria. Geneticists now have tremendous opportunities to use molecular, biochemical, mathematical, and computer science-based (bioinformatics) approaches to investigate how these genes determine observable traits. This information can be used to significantly advance human health and well being, and to meet the food and fiber needs of the world.

A degree in Genetics can provide excellent preparation for careers in academic research and technical support, teaching, agriculture, the biotechnology industry, medicine and health sciences, forensic science, technical writing, and sales or marketing. It is also an excellent background for students wishing to enter a graduate program, medical school, and veterinary school.

Undergraduates in the Genetics program must earn a grade of C- or better to receive credit for Departmental and Non-Departmental required courses. Within the Departmental Required courses, Tier I courses must be taken by all majors, for a total of 31 credit hours*. To accommodate differing interests among students, a series of Tier II courses comprising 9-11 credits are provided. Ethical considerations of genetic based technologies will be infused throughout the curriculum, with a focused course on Science and Ethics in the Tier III portion of the core curriculum.

**Note: This includes BIOL 2610G which also counts as a General Education elective.*

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, other Non-Departmental requirements, and elective credits

to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i>		
MATH 1521G	Calculus and Analytic Geometry II ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences (3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Tier I Requirement also)	3
Viewing a Wider World ³		6
Departmental/College Requirements		
<i>Tier I Requirements</i>		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 302 or BCHE 424	Molecular Biology Techniques Laboratory Experimental Biochemistry I	3
BIOL 377	Cell Biology	3
BIOL 446 or GENE 452	Bioinformatics and NCBI Database Applied Bioinformatics	3
BIOL 455 or A ST 311	Biometry Statistical Applications	3
BIOL 467	Evolution	3
GENE 1110	Experimental Systems in Genetics	1
GENE 305 L	Genetic Techniques	1
GENE 315	Molecular Genetics	3
GENE 320	Hereditary and Population Genetics	3
GENE 440	Genetics Seminar	1
<i>Tier II Requirements</i>		9-11
Select one course from each of the three following categories.		
1. Molecular and Applied Genetics: AGRO 462, ANSC 423, BIOL 442, BIOL 475, BIOL 478, BIOL 488, BIOL 489, GENE 486, GENE 488		
2. Physiology: ANSC 421, BIOL 354, BIOL 381, BIOL 385, BIOL 451, BIOL 474, EPWS 314, HORT 471		
3. Organism Structure: ANSC 370, BIOL 311, BIOL 313, BIOL 322, BIOL 382, BIOL 465, BIOL 470, BIOL 490, EPWS 302, EPWS 373		
<i>Tier III Courses</i>		3
Select one from the following:		
AGRO 303V	Genetics and Society	
HNRS 306V	Science, Ethics and Society	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3

CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
BCHE 396	Biochemistry II, Lecture and Laboratory	3
PHYS 2230G	General Physics for Life Science I	3
or PHYS 1230G	Algebra-Based Physics I	
PHYS 2240G	General Physics for Life Science II	3
or PHYS 1240G	Algebra-Based Physics II	
Electives, to bring the total credits to 120 ⁴		18-20
Select electives to bring total to 120 credits including 48 upper division credits.		
<i>Recommended Electives</i>		
BIOL 351	Biology Internship	
GENE 391	Genetics Internship	
GENE 449	Special Problems	
HNRS courses ⁵		
Total Credits		120

¹ See the General Education Section (p. 220) of the catalog for a full list of courses.

² MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take prerequisite courses before entering MATH 1521G Calculus and Analytic Geometry II.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

⁵ Students interested in graduating with University Honors should consult with an advisor to select 18 credits of relevant Honors (HNRS) courses.

Second Language Requirement

For the Bachelor of Science in Genetics with a major in Genetics and Biotechnology there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
GENE 1110	Experimental Systems in Genetics	1
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G	Composition I	4
Area IV: Social/Behavioral Science Course ¹		3
Credits		15

Spring		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
MATH 1220G	College Algebra	3
Area V: Humanities Course ¹		3
Elective		1
Credits		15

Second Year		
Fall		
CHEM 313	Organic Chemistry I	3
MATH 1250G	Trigonometry & Pre-Calculus	4
GENE 315	Molecular Genetics	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area I: Oral Communication ¹		3
Credits		16

Spring		
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 1511G	Calculus and Analytic Geometry I	4
GENE 320	Hereditary and Population Genetics	3
Elective Course		3
Credits		15

Third Year		
Fall		
BCHE 395	Biochemistry I	3
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 2230G	General Physics for Life Science I	3
Area IV: Creative and Fine Arts		3
Elective		2
Credits		15

Spring		
BIOL 377	Cell Biology	3
BCHE 396	Biochemistry II, Lecture and Laboratory	3
GENE 305 L	Genetic Techniques	1
PHYS 2240G	General Physics for Life Science II	3
Choose from one of the following:		3
A ST 311	Statistical Applications	
BIOL 455	Biometry	
Elective		2
Credits		15

Fourth Year		
Fall		
BIOL 467	Evolution	3
BIOL 302	Molecular Biology Techniques Laboratory or Experimental Biochemistry I	3
Tier II: Organism Structure Course		3-4
Choose from one of the following:		3
BIOL 446	Bioinformatics and NCBI Database	
GENE 452	Applied Bioinformatics	

VWW: Viewing a Wider World Course ²	3
Credits	15-16
Spring	
GENE 440 Genetics Seminar	1
AGRO 303V Genetics and Society	3
Tier II: Molecular and Applied Genetics Course	3
Tier II: Physiology Course	3-4
VWW: Viewing a Wider World Course	3
Elective	1-2
Credits	14-16
Total Credits	120-123

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² See the Viewing a Wider World (p. 224) section for a full list of courses.

Horticulture - Bachelor of Science in Agriculture

Horticulture includes a wide variety of topics that relate to fruit, vegetable and ornamental crops. Careers range from production management to processing and marketing, retail and wholesale management, greenhouse and nursery production, floriculture, landscaping, turf management, research and development, various service activities and positions with local, state and federal agencies.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{2,3}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>11</i>
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social & Behavioral Sciences Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
AGRO 1110G/	Introduction to Plant Science (Lecture & Lab)	4
HORT 1115G		
Viewing A Wider World ^{3,4}		6
Departmental/College Requirements		
EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4

EPWS 314	Plant Physiology	3
HORT 2160	Plant Propagation	3
HORT 365	Principles of Crop Production	4
HORT 447	Seminar	1
SOIL 2110	Introduction to Soil Science	3
<i>Choose 21 credits from the following:</i> ³		<i>21</i>
HORT 2110	Ornamental Plants I	
HORT 2120	Ornamental Plants II	
HORT 2130	Floral Quality Evaluation and Design	
HORT 2990	Floriculture Field Practicum	
HORT 2996	Special Topics	
HORT 300	Special Topics	
HORT 302V	Forestry and Society	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	
HORT 315	Crop Physiology	
HORT 377	Introduction to Turfgrass Management	
HORT 378	Turfgrass Science	
HORT 391	Internship	
HORT 449	Special Problems	
HORT 450	Special Topics	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 479	Advanced Turfgrass Science	
HORT 485	Vegetable Crop Management	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	
<i>Choose 28 credits from the following:</i>		<i>28</i>
A ST 311	Statistical Applications	
ACCT 2110	Principles of Accounting I	
ACCT 2120	Principles of Accounting II	
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 2140	Technology and Communication for Business Management	
AEEC 305	Marketing and Food Agricultural Products	
AEEC 315V	World Agriculture and Food Problems	
AEEC 425	Food and Agribusiness Financial Management	
AGRO 303V	Genetics and Society	
AGRO 311	Introduction to Weed Science	
AGRO 483	Advanced Sustainable Crop Production	
ARTS 1610	Drawing I	
ARTS 2610	Drawing II	
AXED 3115	Small Engine Technology	
AXED 3120	Agricultural Structures	
BCHE 341	Survey of Biochemistry	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
BLAW 316	Legal Environment of Business	
BLAW 385V	Employment and Consumer Law	
BUSA 1110	Intro to Business	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
EPWS 301	Agricultural Biotechnology	
EPWS 373	Fungal Biology	

FSTE 320	Food Microbiology	
FSTE 421	Food Chemistry	
GENE 305 L	Genetic Techniques	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
MKTG 303	Principles of Marketing	
MKTG 313	Retail Management	
SOIL 2110L	Introduction to Soil Science Laboratory	
SOIL 312	Soil Management and Fertility	
SOIL 312 L	Soil Management and Fertility Lab	
SOIL 456	Irrigation and Drainage	
SOIL 476	Soil Microbiology	
SPAN 1110	Spanish I	
SPAN 2110	Spanish III	
SPAN 2120	Spanish IV	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Electives to bring the total credit to 120 ⁵		7
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ Requires a grade of C- or above in horticulture courses.

⁴ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
HORT 1115G	Introductory Plant Science	4
Area IV: Social and Behavioral Science Course ²		3
ACES 1120	Freshman Orientation	1
Credits		15
Semester 2		
ENGL 2210G	Professional & Technical Communication ¹	3

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
Area V: Humanities Course ²		3
HORT Elective Course		3
HORT Elective Course		3

Credits 16

Second Year

Semester 1

ACOM 1130G	Effective Leadership and Communication in Agriculture	3
or COMM 1115G Introduction to Communication		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Area VI: Creative and Fine Arts Course ²		3
HORT Elective Course		3

Credits 16

Semester 2

SOIL 2110	Introduction to Soil Science ¹	3
EPWS 303	Economic Entomology (Spring Only) ¹	3
HORT 2160	Plant Propagation	3
VWW: Viewing a Wider World Course ³		3
HORT Elective Course		3

Credits 15

Third Year

Semester 1

EPWS 310	Plant Pathology (Fall Only) ¹	4
HORT Prefix Course		3
HORT Prefix Course		3
HORT Prefix Course		3
VWW: Viewing a Wider World Course ³		3

Credits 16

Semester 2

EPWS 314	Plant Physiology	3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Elective Course		3
HORT Upper-Division Elective Course		3

Credits 15

Fourth Year

Semester 1

HORT 365	Principles of Crop Production	4
HORT Elective Course		3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
Upper-Division Elective Course		3

Credits 16

Semester 2

HORT 447	Seminar	1
HORT Upper-Division Elective Course		4
Elective Course		3
Elective Course		3

Credits 11

Total Credits 120

¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ **HORT Elective Courses:**

- HORT 2110 Ornamental Plants I
- HORT 2120 Ornamental Plants II
- HORT 2130 Floral Quality Evaluation and Design
- HORT 2990 Floriculture Field Practicum
- HORT 300 Special Topics
- HORT 302V Forestry and Society
- HORT 305 Principles of Genetics
- HORT 307 Landscape Design
- HORT 310 Medicinal Herbs
- HORT 315 Crop Physiology
- HORT 377 Introduction to Turfgrass Management
- HORT 378 Turfgrass Science
- HORT 391 Internship
- HORT 449 Special Problems
- HORT 450 Special Topics
- HORT 462 Plant Breeding
- HORT 471 Plant Mineral Nutrition
- HORT 479 Advanced Turfgrass Science
- HORT 485 Vegetable Crop Management
- HORT 488 Greenhouse Management
- HORT 492 Diagnosing Plant Disorders

⁴ **Horticulture Core Courses:**

- A ST 311 Statistical Applications
- ACCT 2110 Principles of Accounting I
- ACCT 2120 Principles of Accounting II
- AEEC 2110 Principles of Food and Agribusiness Management
- AEEC 2140 Technology and Communication for Business Management
- AEEC 305 Marketing and Food Agricultural Products
- AEEC 315V World Agriculture and Food Problems
- AEEC 425 Food and Agribusiness Financial Management
- AGRO 303V Genetics and Society
- AGRO 311 Introduction to Weed Science
- AGRO 483 Advanced Sustainable Crop Production
- ARTS 1610 Drawing I
- ARTS 2610 Drawing II
- AXED 3115 Small Engine Technology
- AXED 3120 Agricultural Structures
- BCHE 341 Survey of Biochemistry
- BIOL 301 Principles of Ecology
- BIOL 313 Structure and Function of Plants
- BLAW 316 Legal Environment of Business
- BLAW 385V Employment and Consumer Law
- BUSA 1110 Intro to Business
- CHEM 2115 Survey of Organic Chemistry and Laboratory
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics

- EPWS 301 Agricultural Biotechnology
- EPWS 373 Fungal Biology
- FSTE 320 Food Microbiology
- FSTE 421 Food Chemistry
- GENE 305 L Genetic Techniques
- GENE 315 Molecular Genetics
- GENE 320 Hereditary and Population Genetics
- MGMT 309 Human Behavior in Organizations
- MGMT 332 Human Resources Management
- MKTG 303 Principles of Marketing
- MKTG 313 Retail Management
- SOIL 2110L Introduction to Soil Science Laboratory
- SOIL 312 Soil Management and Fertility/SOIL 312 L Soil Management and Fertility Lab
- SOIL 456 Irrigation and Drainage
- SOIL 476 Soil Microbiology
- SPAN 1110 Spanish I
- SPAN 2110 Spanish III

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{2, 3}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social & Behavioral Sciences Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)	4
Viewing A Wider World ^{3, 4}		6
Departmental/College Requirements		

EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4
EPWS 314	Plant Physiology	3
HORT 2160	Plant Propagation	3
HORT 365	Principles of Crop Production	4
HORT 447	Seminar	1
HORT 377	Introduction to Turfgrass Management	4
HORT 378	Turfgrass Science	4
HORT 391	Internship (taken twice for a total of 6 credits)	6
HORT 479	Advanced Turfgrass Science	3
SOIL 2110	Introduction to Soil Science	3

Choose 4 credits from the following:³ 3

HORT 2110	Ornamental Plants I	
HORT 2120	Ornamental Plants II	
HORT 2130	Floral Quality Evaluation and Design	
HORT 2990	Floriculture Field Practicum	
HORT 2996	Special Topics	
HORT 300	Special Topics	
HORT 302V	Forestry and Society	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	
HORT 315	Crop Physiology	
HORT 449	Special Problems	
HORT 450	Special Topics	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 479	Advanced Turfgrass Science (required)	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	

Concentration Courses

AGRO 311	Introduction to Weed Science	4
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Choose 28 credits from the following: 28

A ST 311	Statistical Applications	
ACCT 2110	Principles of Accounting I	
ACCT 2120	Principles of Accounting II	
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 2140	Technology and Communication for Business Management	
AEEC 305	Marketing and Food Agricultural Products	
AEEC 315V	World Agriculture and Food Problems	
AEEC 425	Food and Agribusiness Financial Management	
AGRO 303V	Genetics and Society	
AGRO 483	Advanced Sustainable Crop Production	
ARTS 1610	Drawing I	
ARTS 2610	Drawing II	
BFIN 2110	Introduction to Finance	
BFIN 341	Financial Analysis and Markets	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
BLAW 313	Sports and the Law	
BLAW 316	Legal Environment of Business	
BLAW 385V	Employment and Consumer Law	
BUSA 1110	Intro to Business	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
ECON 2110G	Macroeconomic Principles	

ECON 2120G	Principles of Microeconomics	
ECON 337V	Natural Resource Economics	
ECON 384V	Water Resource Economics	
EPWS 301	Agricultural Biotechnology	
EPWS 373	Fungal Biology	
EPWS 420	Environmental Behavior of Pesticides	
FSTE 320	Food Microbiology	
FSTE 421	Food Chemistry	
GENE 305 L	Genetic Techniques	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
MGMT 309	Human Behavior in Organizations	
MGMT 333	Training and Development	
MGMT 351	Supply Chain Management	
MKTG 303	Principles of Marketing	
MKTG 313	Retail Management	
PHED 1230	Individual Sport: (Golf (Beginning and/or Intermediate))	
SOIL 2110L	Introduction to Soil Science Laboratory	
SOIL 312	Soil Management and Fertility	
SOIL 312 L	Soil Management and Fertility Lab	
SOIL 456	Irrigation and Drainage	
SOIL 476	Soil Microbiology	
SPAN 1110	Spanish I	
SPAN 2110	Spanish III	
SPAN 2120	Spanish IV	

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
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Electives to bring the total credit to 120⁵ 4

Total Credits 120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ Requires a grade of C- or above in horticulture courses.

⁴ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
HORT 1115G	Introductory Plant Science	4
Area IV: Social and Behavioral Science Course ²		3
Credits		14

Semester 2		
ENGL 2210G	Professional & Technical Communication ¹	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Area V: Humanities Course ²		3
HORT Elective Course		3
HORT Elective Course		3
Credits		16

Second Year

Semester 1		
ACOM 1130G or COMM 1115G	Effective Leadership and Communication in Agriculture or Introduction to Communication	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Area VI: Creative and Fine Arts Course ²		3
HORT Elective Course		3
Credits		16

Semester 2		
SOIL 2110	Introduction to Soil Science ¹	3
EPWS 303	Economic Entomology (Spring Only) ¹	3
HORT 2160	Plant Propagation	3
VWW: Viewing a Wider World Course ³		3
HORT 377	Introduction to Turfgrass Management	4
Credits		16

Third Year

Semester 1		
EPWS 310	Plant Pathology (Fall Only) ¹	4
HORT 378	Turfgrass Science	4
AGRO 311	Introduction to Weed Science	4
VWW: Viewing a Wider World Course ³		3
Credits		15

Semester 2		
EPWS 314	Plant Physiology	3
HORT 479	Advanced Turfgrass Science	3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Elective Course		3
Credits		15

Fourth Year

Semester 1		
HORT 365	Principles of Crop Production	4
HORT 391	Internship	3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
Upper-Division Elective Course		3
Credits		16

Semester 2

HORT 447	Seminar	1
HORT 391	Internship	3
HORT Upper-Division Elective Course		4
Elective Course		3
Elective Course		1
Credits		12

Total Credits		120
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¹ These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ HORT Elective Courses:

- HORT 2110 Ornamental Plants I
- HORT 2120 Ornamental Plants II
- HORT 2130 Floral Quality Evaluation and Design
- HORT 2990 Floriculture Field Practicum
- HORT 300 Special Topics
- HORT 302V Forestry and Society
- HORT 305 Principles of Genetics
- HORT 307 Landscape Design
- HORT 310 Medicinal Herbs
- HORT 315 Crop Physiology
- HORT 377 Introduction to Turfgrass Management
- HORT 378 Turfgrass Science
- HORT 391 Internship
- HORT 449 Special Problems
- HORT 450 Special Topics
- HORT 462 Plant Breeding
- HORT 471 Plant Mineral Nutrition
- HORT 479 Advanced Turfgrass Science
- HORT 485 Vegetable Crop Management
- HORT 488 Greenhouse Management
- HORT 492 Diagnosing Plant Disorders

⁴ Horticulture Core Courses:

- A ST 311 Statistical Applications
- ACCT 2110 Principles of Accounting I
- ACCT 2120 Principles of Accounting II
- AEEC 2110 Principles of Food and Agribusiness Management
- AEEC 2140 Technology and Communication for Business Management
- AEEC 305 Marketing and Food Agricultural Products
- AEEC 315V World Agriculture and Food Problems
- AEEC 425 Food and Agribusiness Financial Management
- AGRO 303V Genetics and Society
- AGRO 311 Introduction to Weed Science
- AGRO 483 Advanced Sustainable Crop Production
- ARTS 1610 Drawing I
- ARTS 2610 Drawing II
- AXED 3115 Small Engine Technology
- AXED 3130 Advanced Technology in the Agricultural Mechanization
- BCHE 341 Survey of Biochemistry

- BIOL 301 Principles of Ecology
- BIOL 313 Structure and Function of Plants
- BLAW 316 Legal Environment of Business
- BLAW 385V Employment and Consumer Law
- BUSA 1110 Intro to Business
- CHEM 2115 Survey of Organic Chemistry and Laboratory
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics
- EPWS 301 Agricultural Biotechnology
- EPWS 373 Fungal Biology
- FSTE 320 Food Microbiology
- FSTE 421 Food Chemistry
- GENE 305 L Genetic Techniques
- GENE 315 Molecular Genetics
- GENE 320 Hereditary and Population Genetics
- MGMT 309 Human Behavior in Organizations
- MGMT 332 Human Resources Management
- MKTG 303 Principles of Marketing
- MKTG 313 Retail Management
- SOIL 2110L Introduction to Soil Science Laboratory
- SOIL 312 Soil Management and Fertility/SOIL 312 L Soil Management and Fertility Lab
- SOIL 456 Irrigation and Drainage
- SOIL 476 Soil Microbiology
- SPAN 1110 Spanish I
- SPAN 2110 Spanish III

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

Soil science is integrated into the management of the environment and natural resources. Students interested in careers of conservation, environmental management, urban planning, waste disposal and related fields in government and industry may choose from a variety of course offerings. The economic and social implications as well as the technological aspects of resource management are included in the concentration courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major,

you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I ²	
MATH 1511G	Calculus and Analytic Geometry I ²	
<i>Area III/IV: Laboratory Science and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social & Behavioral Sciences Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
GEOL 1110G	Physical Geology	4
Viewing A Wider World ³		6
Departmental/College Requirements		
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
SOIL 447	Seminar	1
Choose one SOIL Elective Course (300-level or above)		3
Select 12-13 credits from the following:		12-13
SOIL 424 or SOIL 479	Soil Chemistry and Environmental Soil Chemistry	
SOIL 456	Irrigation and Drainage	
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 477	Environmental Soil Physics	
<i>Concentration Coursework</i> ⁴		
Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits		30
All course selections must be in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above		
<i>Category 1: Soil, Water, Wildlife, or Range Conservation</i>		
Course category areas are as follows:		
Range Science		
Soil		
Environmental Science		
Wildlife Science		
<i>Category 2: Ecology, Plant Biology, or Crop Production</i>		
Course category areas are as follows:		
Agronomy		
Biology		
Entomology		
Plant Pathology		

Weed Science		
Horticulture		
Toxicology		
Category 3: Earth, Mineral, or Climatic Resources & Economics		
Course category areas are as follows:		
Agricultural Economics		
Geography		
Geology		
Planning		
Survey		
Category 4: Advanced Science, Computing & Statistics		
Course category areas are as follows:		
Math		
Chemistry		
Physics		
Computer-Oriented		
Statistics or Applied Statistics		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2115	Survey of Organic Chemistry and Laboratory (or above except CHEM 310V)	4
PHYS 1230G	Algebra-Based Physics I	3
Choose two from the following (lab is NOT required for this major):		6
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 311	General Microbiology	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		11-13
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGL 1110G	Composition I	4
Elective Courses		2
ACES 1120 & ACES 1210	Freshman Orientation and Financial Fitness for College Students (recommended)	
BIOL 2110G or BIOL 2610G	Principles of Biology: Cellular and Molecular Biology or Principles of Biology: Biodiversity, Ecology, and Evolution	3
Choose one from the following: ²		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
Area V: Humanities Course ³		3
Credits		15-16
Spring		
GEOL 1110G	Physical Geology	4
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area VI: Creative and Fine Arts Course ³		3
Concentration Category Course: Category 1 or 2 ⁴		4
Elective Course ¹		3
Credits		17

Second Year

Fall		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
Viewing a Wider World ⁵		3
Concentration Category Course: Categories 1, 2, or 3 ⁴		4
Choose one from the following: ⁶		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 311	General Microbiology	
Credits		15
Spring		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
ENGL 2210G or ENGL 2215G	Professional & Technical Communication or Advanced Technical and Professional Communication	3
Elective Course ¹		3-4
Credits		15-16

Third Year

Fall		
SOIL 472	Soil Morphology and Classification	4
Viewing a Wider World Course ⁵		3
Concentration Category Course: Category 1, 2, 3 or 4 ⁴		3
Concentration Category Course: Category 1, 2, 3, or 4 ⁴		3

PHYS 1230G	Algebra-Based Physics I	3
Credits		16
Spring		
SOIL 456 or SOIL 476	Irrigation and Drainage or Soil Microbiology	3
SOIL 479	Environmental Soil Chemistry	3
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Credits		16
Fourth Year		
Fall		
SOIL 447	Seminar	1
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Elective Course ¹		3
Credits		13
Spring		
SOIL 477	Environmental Soil Physics	3
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 ⁴		3
Elective Course ¹		3
Credits		16
Total Credits		123-125

¹ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

² The degree requires wither MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I, students who do not test into these courses will have additional MATH courses to complete in this semester and where "Elective Courses" are listed in the Roadmap.

³ See the General Education (p. 220) section of the catalog for a full list of courses

⁴ Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁶ Students must two courses from the following, to fulfill degree requirements:

- BIOL 2110G Principles of Biology: Cellular and Molecular Biology
- BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution
- BIOL 311 General Microbiology

Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

The soil and water science concentration is for students interested in careers in water management and water quality. Employment opportunities exist with irrigation districts, consulting firms, and government agencies dealing with water management and quality. The optimum use of water in semi-arid areas is emphasized through selection of courses in the technical and social sciences.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I ²	
MATH 1511G	Calculus and Analytic Geometry I ²	
<i>Area III/IV: Laboratory Science and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	11
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social & Behavioral Sciences Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
GEOL 1110G	Physical Geology	4
Viewing A Wider World ³		6
Departmental/College Requirements		
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
SOIL 447	Seminar	1
Choose one SOIL Elective Course (300-level or above)		3
Select 12-13 credits from the following:		12-13
SOIL 424	Soil Chemistry	

or SOIL 479	Environmental Soil Chemistry
SOIL 456	Irrigation and Drainage
SOIL 472	Soil Morphology and Classification
SOIL 476	Soil Microbiology
SOIL 477	Environmental Soil Physics

Concentration Coursework⁴

Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits

All course selections must in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above

Category 1: Crop Production & Protection

Course category areas are as follows:

Agronomy
Entomology
Plant Pathology
Weed Science
Horticulture

Category 2: Soil & Water Engineering Management

Course category areas are as follows:

Agricultural Engineering
Agricultural Economics
Civil Engineering
Environmental Sciences
Horticulture
Soil

Category 3: Ecology

Course category areas are as follows:

Biology
Geography
Geology
Range Science
Soil
Waste-Management
Wildlife Science

Category 4: Advanced Science, Computing & Statistics

Course category areas are as follows:

Math
Chemistry
Physics
Computer-Oriented
Statistics or Applied Statistics

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

CHEM 2115	Survey of Organic Chemistry and Laboratory (or above except CHEM 310V)	4
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PHYS 1230G	Algebra-Based Physics I	3
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Choose two from the following (lab is NOT required for this major):

BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	6
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 311	General Microbiology	

Second Language: (not required)

Electives, to bring the total credits to 120⁵ **11-13**

Total Credits **120**

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGL 1110G	Composition I	4
Elective Course ¹		2
ACES 1120	Freshman Orientation (recommended)	
ACES 1210	Financial Fitness for College Students (recommended)	
Choose one from the following: ²		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
Choose one from the following: ³		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
Area V: Humanities Course ²		3
Credits		15-16

Spring

GEOL 1110G	Physical Geology	4
Concentration Category Course: Category 1 or 2 ⁴		4
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area VI: Creative and Fine Arts Course ⁵		3
Elective Course ¹		3
Credits		17

Second Year

Fall		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I	1
Viewing a Wider World ⁶		3
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		4
Choose one from the following: ²		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology ⁴	

BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 311	General Microbiology	
Elective Course ¹		3
Credits		18
Spring		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
ENGL 2210G or ENGL 2215G	Professional & Technical Communication or Advanced Technical and Professional Communication	3
Elective Course ¹		3-4
Credits		15-16
Third Year		
Fall		
SOIL 472	Soil Morphology and Classification	4
Viewing a Wider World Course ⁶		3
Area IV: Social/Behavioral Sciences Course ⁵		3
Concentration Category Course: Category 4 ⁴		3
PHYS 1230G	Algebra-Based Physics I	3
Credits		16
Spring		
SOIL 456 or SOIL 476	Irrigation and Drainage or Soil Microbiology	3
SOIL 424	Soil Chemistry	3
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Credits		16
Fourth Year		
Fall		
SOIL 477	Environmental Soil Physics	3
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Credits		12
Spring		
SOIL 447	Seminar	1
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Concentration Category Course: Categories 1, 2, 3, or 4 ⁴		3
Credits		11
Total Credits		120-122

¹ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

² Students must two courses from the following, to fulfill degree requirements:

- BIOL 2110G Principles of Biology: Cellular and Molecular Biology
- BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution
- BIOL 311 General Microbiology

³ The degree requires wither MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I, students who do not test into these courses will have additional MATH courses to complete in this semester and where "Elective Courses" are listed in the Roadmap.

⁴ Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

⁵ See the General Education (p. 220) section of the catalog for a full list of courses

⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Soil Science (Soils) - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

Crop production and plant growth are emphasized in the soils concentration. Soil management, soil conservation, and soil reclamation are related to plant growth for those students interested in both private industry and government employment opportunities as well as farm management.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I ²	
MATH 1511G	Calculus and Analytic Geometry I ²	
<i>Area III/IV: Laboratory Science and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	

Area IV: Social & Behavioral Sciences Course (3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective		
GEOL 1110G	Physical Geology	4
Viewing A Wider World ³		6
Departmental/College Requirements		
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
SOIL 447	Seminar	1
Choose one SOIL Elective Course (300-level or above)		3
Select 12-13 credits from the following:		12-13
SOIL 424 or SOIL 479	Soil Chemistry Environmental Soil Chemistry	
SOIL 456	Irrigation and Drainage	
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 477	Environmental Soil Physics	
Concentration Coursework ⁴		
Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits		30
All course selections must in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above		
Category 1: Crop Production & Protection		
Course category areas are as follows:		
Agronomy		
Entomology		
Plant Pathology		
Weed Science		
Horticulture		
Category 2: Plant Biology & Ecology		
Course category areas are as follows:		
Biology		
Rangeland Resources		
Category 3: Soil, Water & Agricultural Business Management		
Course category areas are as follows:		
Agricultural Economics		
Geography		
Economic Geology		
Range Science		
Soil		
Category 4: Advanced Science, Computing & Statistics		
Course category areas are as follows:		
Math		
Chemistry		
Physics		
Computer-Oriented		
Statistics or Applied Statistics		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2115	Survey of Organic Chemistry and Laboratory (or above except CHEM 310V)	4
PHYS 1230G	Algebra-Based Physics I	3
Choose two from the following (lab is NOT required for this major):		6
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	

BIOL 311	General Microbiology	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		11-13
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
MATH 1220G	College Algebra ¹	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
GEOL 1110G	Physical Geology	4
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
Area IV: Social and Behavioral Science Course ²		3
Credits		15
Semester 2		
MATH 1430G	Applications of Calculus I ¹	3
ENGL 1110G	Composition I ¹	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
CHEM 1121	General Supplemental Instruction I	1
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	3
Credits		15
Second Year		
Semester 1		
PHYS 1230G	Algebra-Based Physics I	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory ¹	4

CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
CHEM 1122	General Supplemental Instruction II	1
Credits		15
Semester 2		
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab ¹	4
ENGL 2210G	Professional & Technical Communication ¹	3
Area V: Humanities Course ²		3
Area VI: Creative and Fine Arts Course ²		3
Soils Option Course		3
Credits		16
Third Year		
Semester 1		
SOIL 424	Soil Chemistry ¹	3
SOIL 472	Soil Morphology and Classification ¹	4
Choose one SOIL Elective Course (300-level or above)		3
Soils Option Course		3
VWW: Viewing a Wider World Course ³		3
Credits		16
Semester 2		
SOIL 476 & 476 L	Soil Microbiology and Soil Microbiology Laboratory	4
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
Soils Option Course		3
Soils Option Course		3
Soils Option Course		3
Credits		17
Fourth Year		
Semester 1		
SOIL 477 & 477 L	Environmental Soil Physics and Environmental Soil Physics Laboratory	4
VWW: Viewing a Wider World Course ³		3
Soils Option Course		3
Soils Option Course		3
Soils Option Course		3
Credits		16
Semester 2		
SOIL 456	Irrigation and Drainage	3
SOIL 447	Seminar	1
Soils Option Course		3
Soils Option Course		3
Credits		10
Total Credits		120

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Agronomy - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
AGRO 365	Principles of Crop Production	4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
Select 3-4 credits from the following to bring the total AGRO and SOIL credits to a minimum of 18 credits:		3-4
AGRO 2160	Plant Propagation	
AGRO 305	Principles of Genetics	
AGRO 311	Introduction to Weed Science	
AGRO 315	Crop Physiology	
AGRO 462	Plant Breeding	
AGRO 471	Plant Mineral Nutrition	
AGRO 483	Advanced Sustainable Crop Production	
SOIL 456	Irrigation and Drainage	
Total Credits		19-20

Environmental Science - Undergraduate Minor

A minor in Environmental Sciences requires the following minimum coursework. Note that the prerequisites for most of these courses include chemistry, biology, and/or calculus requirements. Grades of C or better are required in all courses applied to the minor.

Prefix	Title	Credits
ENVS 1110G	Environmental Science I	4
ENVS 2111	Environmental Engineering and Science	3
ENVS 301	Principles of Ecology	3
ENVS 422	Environmental Chemistry	3
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
Total Credits		19

Genetics and Biotechnology - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
GENE 1110	Experimental Systems in Genetics	1
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
GENE 305 L	Genetic Techniques	1
GENE 452	Applied Bioinformatics	3
Select two from the following:		6
BIOL 305	Principles of Genetics	
GENE 315	Molecular Genetics	

GENE 320	Hereditary and Population Genetics	
Total Credits		18

Horticulture - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
HORT 1115G	Introductory Plant Science	4
HORT 2160	Plant Propagation	3
SOIL 2110	Introduction to Soil Science	3
Select 9 credits from the following: ¹		9
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	
HORT 365	Principles of Crop Production	
HORT 377	Introduction to Turfgrass Management	
HORT 378	Turfgrass Science	
HORT 391	Internship	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 485	Vegetable Crop Management	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	
Total Credits		19

¹ or other upper division HORT courses deemed appropriate by student's advisor

Soil Science - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
SOIL 472	Soil Morphology and Classification	4
Select any SOIL course to bring the total SOIL credit hours to 18.		6
Total Credits		18

School of Hotel, Restaurant and Tourism Management

Undergraduate Program Information

The School of Hotel, Restaurant & Tourism Management is committed to the broad land-grant mission of New Mexico State University. The school's mission is to serve the needs of our constituents through innovative teaching, research, service, professional applications and partnerships in a multi-cultural and international environment.

This bachelor degree program prepares students for supervisory and management positions in all areas of the diverse and growing hospitality and tourism industry. The full bachelor of science degree program is available through NMSU main campus as well as completely online through NMSU Online. The program also provides a foundation for continuing development to advance to more senior management or to pursue entrepreneurial opportunities. In this service-oriented,

professional program, faculty, students and industry partners bring together theory and practice to forge hospitality management excellence. The curriculum is designed to educate students as individuals and professionals in a changing society. Students take a core curriculum featuring courses in a broad spectrum of skills and knowledge needed for industry and personal success. They develop an individual plan with a faculty mentor for selecting professional elective courses based on their interests. A grade of C- or better must be earned in each upper-division HRTM class to satisfy the requirement of the major.

Students are required to participate in an internship program that is offered only after completion of 400 hours of hospitality work experience. The internship sequence consists of three, one-credit courses: HRTM 307 Professional Development, HRTM 408 Hospitality Internship, and HRTM 409 HRTM Internship Seminar and includes another 400 hours in the field, normally the summer between the student's junior and senior year. The HRTM 408 course is a prerequisite for several of the student's final 400-level courses. Thus, at the end of both the work experience practicum and the internship, students will have completed a minimum of 800 hours professional work experience in the field.

Special Features of the School of Hotel, Restaurant, and Tourism Management

The School of Hotel, Restaurant and Tourism Management provides excellent opportunities for experiential learning. Students take hands-on food and beverage and meetings and events courses in the 100 West Café and Bobby Lee Lawrence Academy of Wine. The Hospitality Technology Lab seats 36 for courses using hospitality simulation and general software programs.

The School of HRTM has a special relationship with the NMSU Courtyard by Marriott hotel and Total Management Systems, Inc. to provide educational opportunities for our students. Corporate executives and property managers are frequent guest speakers in classes. Part-time jobs, internships, and management opportunities are available at the property as well as the company's other locations throughout the state. Other industry partners that are actively involved in the program and provide scholarships and other opportunities for students include the New Mexico Beef Council, New Mexico Restaurant Association, the American, Greater Albuquerque and El Paso Hotel & Lodging Associations, New Mexico Hospitality Association, New Mexico Wine Association, Latino Hotel Association and many more.

The School houses the Marriott Hospitality Futures Center. The center is funded through a grant by the J. Willard and Alice S. Marriott Foundation. Its office suite has been designated to allow the campus and surrounding community to discover the many opportunities available when exploring a career in hospitality. It hosts facilitated workshops, and has a strong dedication to outreach throughout New Mexico, El Paso, and the surrounding areas to student groups, public schools, and our industry partners. The HRTM's Annual Career Fair brings 30 - 40 companies to campus each spring semester to interview students for jobs, internships, management training programs, and other career opportunities. Many recruiters come to campus at other times of the year as well.

Trips to major industry trade shows throughout the country and field trips to hospitality properties are only a few of the professional activities available to our students. HRTM's Faculty Led International Program (FLIP) takes students to Florence, Italy each summer. The School's National Society for Minorities in Hospitality chapter is extremely active and represents HRTM at many college, university, and national activities.

Other student organizations include Eta Sigma Delta, Delta Sigma Pi, College Ambassadors, and Peer Mentors.

Graduate Program Information

Students can earn a Master of Science degree in Family and Consumer Sciences with a concentration in Hotel, Restaurant and Tourism Management (HRTM). Students can complete the program on campus or completely online through NMSU Online. The emphasis in HRTM combines both coursework and research to expand the student's knowledge, abilities, and problem-solving skills.

Students begin the program by learning about the current trends in a wide range of hotel, restaurant and tourism academic research areas. Students also take graduate classes that apply to their chosen area of specialization. Some students focus on general hospitality management. However, most choose an area of interest such as tourism, foodservice, hotel operations, culinary arts, destination management, revenue management, sales and marketing, hospitality or culinary education, beverage management, vacation ownership, hospitality information systems, or human resource management/training. Some of our students are hospitality educators who may desire to take specialization courses in online teaching or educational technology.

Students with undergraduate degrees in closely related fields (including Business, Information Technology, Food Science, Culinary Arts, and Education) are strongly encouraged to apply as are students from under-represented groups and international students. We also welcome applications from non-traditional applicants who have work experience in the hotel, restaurant and tourism business. These students bring unique views to our program and strengthen our breadth and diversity.

In addition to the Graduate School requirements, the admissions criteria for the Master of Family and Consumer Sciences, HRTM concentration include letters of reference, a statement of interest essay, and resume. Suggested departmental deadlines for review of admission materials are six weeks prior to the first day of the semester of desired start. However, international students must apply by March 1 for Fall semester admissions and October 1 for spring semester admissions.

A minimum of 30 credits (including 4-6 credits of thesis) is required under the thesis plan. A non-thesis plan is available that requires a minimum of 30 credits of course work with a written comprehensive applied management project. Both plans require a final oral examination. Students will take 3 credits of statistics and 3 credits of research methodology at the graduate level. Students without work experience in HRTM will complete a paid internship in their area of specialization. Prior to the completion of 12 credits, the student will form a program advisory committee and determine the appropriate courses for the degree work.

There are a limited number of graduate teaching assistant positions available for HRTM emphasis students.

Please see the HRTM website at <https://hrtm.nmsu.edu/> for information about all of the School of Hotel, Restaurant and Tourism Management's programs.

Degree for the Department

- Hotel, Restaurant and Tourism Management - Bachelor of Science (p. 419)

- Hotel, Restaurant and Tourism Management - Bachelor of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/hotel-restaurant-tourism-mgt-bs-online/>)

- Hotel, Restaurant and Tourism Management - Undergraduate Minor (p. 421)

Director - Jean Hertzman

Professors - Jean Hertzman; Keith Mandabach; Betsy Stringam **Assistant Professor** - Christina K. Dimitriou **College Assistant Professors** - Daren Bloomquist; Peter Mitchell; Danielle Young **Professor Emeritus** - Priscilla Bloomquist

Hotel, Restaurant and Tourism Management Courses

HRTM 1120G. Introduction to Tourism

3 Credits (3)

Survey of travel and tourism development and operating characteristics.

Learning Outcomes

1. Define tourism and related terms.
2. Identify and explain the role of the elements of the destination mix.
3. Identify the potential socio-cultural, economic and environmental impacts of tourism.
4. Identify and describe the role of key governmental and nongovernmental organizations in tourism.
5. Describe basic tourism planning and development principles.
6. Discuss the unique challenges of tourism marketing and standard marketing methods.
7. Describe the components of the tourism distribution system.
8. Demonstrate a basic understanding of traveler behavior including motivations and barriers to travel.
9. Identify major factors that influence traveler flows. 1
10. Describe the role of major modes of transportation in the tourism system. 1
11. Identify and describe the three pillars of sustainable tourism development. 1
12. Explain personal and social responsibility as it relates to sustainable tourism development. 1
13. Demonstrate effective communication and critical thinking skills.

HRTM 1130. Introduction to Hospitality Management**3 Credits (3)**

Overview of the major segments of the hospitality industry, with a focus on basic management principles.

Learning Outcomes

1. Understand the concept of management contracts and franchising.
2. Recognize and understand needed leadership qualities to achieve organizational objectives.
3. Understand the hospitality industry within the global environment.
4. Identify company and industry trends.
5. Understand the functions of all departments in a hospitality organization (restaurant, hotel, club, etc.).
6. Apply the concepts of convention management, meeting and event planning, and casino management.
7. Understand the concepts of quick and institutional/contract foodservice management.
8. Understand the principles of bar management and compare and contrast wines, beers and distilled spirits.
9. Manage the process of service delivery. 1
10. Identify and solve managerial problems 1
11. Manage a diverse workforce and develop positive employee relations to reduce turnover.

HRTM 2110. Safety, Sanitation and Health in the Hospitality Industry**1 Credit (1)**

Addresses public health, HACCP, and food safety responsibilities in the hospitality industry. Sanitation certification test allows students to receive national ServSafe Food Protection Manager Certification. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify the hazards to safe food and the foods at risk in a foodservice operation.
2. Identify and discuss the Hazard Analysis Critical Control Point (HACCP) system and be able to design a HACCP flowchart.
3. Demonstrate knowledge of how to protect food during purchasing, receiving, storing, preparing, holding, and serving.
4. Discuss the procedures for ensuring sanitary equipment, facilities, and food-handling practices.
5. Explain how to set-up cleaning, safety, pest control, crisis management, and training programs.

HRTM 2120. Food Production and Service Fundamentals**3 Credits (1+4P)**

Basic overview of food service systems including menu management, purchasing and production. The course includes basic principles of food fabrication and production. Topics include knife skills, culinary terminology, product identification, quality standards, nutritional cooking theory and application of food preparation techniques. The course includes laboratory aspects and demonstration of basic food production techniques, service styles, practices and procedures in food service operations including culinary math. This course provides students with an understanding of food service sanitation and culinary nutrition. Completion of a national certification examination is required. Students who have not completed HRTM 2110 before enrolling in the course must have proof of valid ServSafe Food Protection Manager certificate. Restricted to Las Cruces campus only. Prerequisite(s)/Corequisite(s): HRTM 2110

Prerequisite(s): HRTM 1130 or FSTE 2110G.

Learning Outcomes

1. Demonstrate use of standard recipes and how to reduce and increase their yields
2. Demonstrate basic culinary knife cuts, basic fabrication and mise en place
3. Demonstrate basic cookery techniques of dry, moist and a combination of heat
4. Demonstrate the proper plating and garnishing of foods
5. Describe proper personal behaviors required for the safe handling of food
6. Identify and properly operate kitchen equipment.
7. Pass the ServSafe Exam
8. Describe the three forms of food contaminants and preventative measures.
9. Demonstrate how to properly "set" a table for service 1
10. Demonstrate how to provide dining room service with proper etiquette 1
11. Demonstrate safe work habits, identify safety hazards, and employ preventative safety measures. 1
12. Maintain positive relations with fellow students and faculty through teamwork. 1
13. Exhibit appropriate work habits and attitudes; demonstrate a willingness to compromise. 1
14. Demonstrate a positive attitude, conversation skills, personal hygiene and work attire.

HRTM 2130. Hotel Operations I**3 Credits (3)**

Analysis of hotel operations to include: guest services, reservations, reception, guest/city ledger and the night audit. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): HRTM 1130.

Learning Outcomes

1. Outline the history, magnitude and culture of the hotel industry
2. Define and identify hotel ownership and operational structures
3. Outline the organization and structure of a hotel and resort.
4. Describe and calculate the components and processes of room reservation forecasting, pricing and revenue management.
5. Outline and explain the flow of the guest from pre-arrival through arrival, room occupancy and departure.
6. Demonstrate the procedures and processes for Guest Accounting, the City Ledger, Guest Credit and the Night Audit.
7. Discuss problem solving and guest service associated with the front office and other departments of the hotel and resort.
8. Forecast impacts of technology to the guest services and hotel operations
9. Describe the day to day activities and responsibilities of a Hotel Front Office Manager or a Hotel Assistant General Manager (AGM).

HRTM 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be assigned on a semester basis for both lecture and laboratory assignments. May be repeated for a maximum of 4 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

HRTM 301. Hotel, Restaurant, and Tourism Marketing**3 Credits (3)**

The development of effective marketing programs for hospitality service organizations. **Prerequisites:** HRTM 1130

HRTM 302. Hospitality Management Accounting**3 Credits (3)**

Specialized accounting for hotel revenue and expenses; accounting for inventory, property, and equipment; hospitality payroll accounting; hotel departmental financial statements; income statement, balance sheet, and statement of cash flows; the analysis of financial statements; interim and annual reports; budgeting expenses; forecasting sales; budgetary reporting and analysis; and financial decision making.

Prerequisite: ACCT 2110.

HRTM 304. Hospitality and Travel Law**3 Credits (3)**

Specialized applications of the law to the hospitality and tourism industry. **Prerequisites:** HRTM 1130

HRTM 307. Professional Development**1 Credit (1)**

Covers essential elements of career management including preparation for a successful internship. Restricted to majors. Graded S/U.

HRTM 311. Hospitality Leadership Management**3 Credits (3)**

Examines modern leadership theory in the context of the hospitality industry. Connects contemporary leadership topics to their historical antecedents through focused reading, discussion and film.

Prerequisites: HRTM 1130 and HRTM 1120.

HRTM 363. Quantity Food Production and Service**4 Credits (1+6P)**

Covers quantity food production and service including cooking concepts, sanitation and safety, teamwork, dining room service, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe Food Protection Manager or NM Food Handler certification required. May be repeated up to 4 credits.

Prerequisite(s): HRTM 2120.

HRTM 408. Hospitality Internship**1 Credit (1)**

Hospitality and tourism professional work experience for HRTM majors only. Restricted to majors.

Prerequisites: HRTM 307 and consent of instructor.

HRTM 409. HRTM Internship Seminar**1 Credit (1)**

A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they encountered during HRTM 408 (Internship) and analyze them. Restricted to majors.

Prerequisites: HRTM 408.

HRTM 410. Hospitality Cost Control**3 Credits (3)**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers.) Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. May be repeated up to 3 credits.

Prerequisite(s): HRTM 302, HRTM 363.

HRTM 412. Beverage Management**3 Credits (3)**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. May be repeated up to 3 credits.

Prerequisite(s): HRTM 363.

HRTM 413. Restaurant Operations Management**4 Credits (1+6P)**

Provides a detailed understanding of the processes of restaurant operations management. Students are expected to increase kitchen and service technical skills, develop and cook from recipes, develop a personal leadership style, understand food and wine pairing, and supervise front and back of the house operations. Provides the opportunity to perform a detailed analysis of a food and beverage operation. Proof of valid ServSafe Food Protection Manager or NM Food Handler certification and current NM Alcohol Server certification required. May be repeated up to 4 credits.

Prerequisite(s): HRTM 363.

HRTM 414. Wine Appreciation**3 Credits (3)**

An experiential examination of wine through lectures, guest speakers and focused tasting of wine and food. Topics include viticulture, wine making varietals, terroir, wine service, tasting and evaluation techniques, and food pairings. Student must be at least 21 years old. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

HRTM 416. Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement**3 Credits (3)**

Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment.

Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 420. Club Management and Marketing**3 Credits (3)**

Provides an understanding of the general operational and administrative procedures practiced in private clubs from a marketing perspective with a special emphasis on managing and marketing club food and beverage operations and service. It will provide the professional golf management and hospitality students with the unique sensitivities required in managing and operating in the increasingly lucrative club management market.

HRTM 430. Hospitality Facilities Management**3 Credits (3)**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant. May be repeated up to 3 credits.

Prerequisite(s): HRTM 2130, HRTM 408.

HRTM 431. Hotel Operations II**3 Credits (3)**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. May be repeated up to 3 credits.

Prerequisite(s): HRTM 2130.

HRTM 432. Hotel Revenue and Sales Management**3 Credits (3)**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. May be repeated up to 3 credits.

Prerequisite(s): HRTM 2130.

HRTM 434. Senior Capstone Experience**3 Credits (3)**

Synthesizes all previous work. Students apply multi-disciplinary principles to the analysis of hospitality business cases and tourism problems.

Prerequisite: HRTM 408.

HRTM 435. Resort Management**3 Credits (3)**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities.

Prerequisite(s): HRTM 2130 or consent of instructor.

HRTM 436V. Sustainability in the Hospitality Industry**3 Credits (3)**

This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry.

Learning Outcomes

1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 443. Meetings, Conventions and Special Events**3 Credits (3)**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of Instructor.

HRTM 444. Entertainment Business and Venue Management**3 Credits (3)**

This course will review and examine the principles and practices associated with managing a public assembly venue and the nature of the venue and entertainment business. This is a comprehensive course designed to cover all aspects of incorporated event practices such as marketing, production, contracts, ticketing, and security.

Learning Outcomes

1. Analyze the origin and history of public assembly venues and the role they play within the community.
2. Analyze different ownership and management structures and how governance relationships impact operational management.
3. Analyze the business and financial operations of a public assembly venue.
4. Describe the booking process, the entities involved, and the importance of relationships.
5. Analyze and create marketing and sales strategies for both a public assembly venue and an event that is booked in the venue.
6. Identify and analyze the ticket system options available to venue managers, as well as their importance in access management, financial accountability, and data collection.
7. Analyze the role and importance of ancillary revenue sources, as well as the need for creativity and entrepreneurship.
8. Describe the operational systems and processes required to maintain a venue and produce events.
9. Analyze the event planning process and how it is used to produce an event experience for guests and clients. 1
10. Analyze management's role in developing and maintaining a safe and secure public assembly venue.

HRTM 445. An Overview of Italian Tourism focused on Food, Wine, Art and Culture**3 Credits (3)**

The course content provides a global perspective and understanding of Italian food, wine, art and culture and their integration into tourism. The content is designed to provide students an appreciation of Italian cultural values and an overview of food, wine and art in the tourism regions of Italy.

Learning Outcomes

1. Describe and explain the basic history of the tourism regions of Italy.
2. Recognize and describe the Italian food and wine industry and its impact on tourism.
3. Detail how the Italian's integrate sustainability into tourism.
4. Recognize the impact of culture and art on tourism.
5. Explain strategies for responsible travel abroad in Italy and the European Union focused on personal and group safety.
6. Analyze and evaluate multicultural differences between Italian and American societies focused on effective personal communication practices.
7. Produce a 20 slide narrated online presentation with pictures that focused on at least two course learning objectives

HRTM 450. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Prerequisite: consent of instructor.

HRTM 492. Special Problems**1-4 Credits**

Individual research in a selected subject area of hospitality management. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

Prerequisite: consent of instructor.

HRTM 501. The Hospitality Industry and Sustainable Competitive Strategy**3 Credits (3)**

An examination of the hospitality industry, and its contemporary strategic management principles and practices. Key components, industry organization, and competitive environment of the hospitality industry are analyzed. Strategic decision making principles are examined to create sustainable competitive advantages for hospitality and service industry leaders and organizations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Analyze key components, industry organization, and competitive environment of the hospitality industry.
2. Examine strategic decision making principles to create sustainable competitive advantages for hospitality and service industry leaders and organizations

HRTM 502. Advanced Hospitality Services Management**3 Credits (3)**

This course explores and applies the design and management of service quality in global hospitality organizations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Investigate the design and management of service quality in global hospitality organizations to create authentic and memorable hospitality experiences.
2. Design and manage service delivery systems to create a culture of service excellence
3. Define and discuss the relationship between service and financial performance in hospitality organizations

HRTM 503. Hospitality Organizational Leadership and Human Resources**3 Credits (3)**

Application of key organizational, leadership and human resource theories to global hospitality organizations. Analysis of key hospitality industry leaders, companies and systems. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Apply organizational, leadership and human resource theories to global hospitality organizations.
2. Analyze key hospitality industry leaders, companies and systems.
3. Coordinate teams to provide effective management and maintain successful employee and guest relations.

HRTM 504. Marketing Strategy for Global Hospitality**3 Credits (3)**

Application, analysis and evaluation of marketing theories, strategies and tactics for developing sustainable competitive advantage in the global hospitality industry. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Explore and analyze global hospitality markets, including the values and expectations of global hospitality consumers
2. Analyze and evaluate marketing theories, strategies and tactics for developing sustainable competitive advantage in the global hospitality industry.
3. Design marketing strategies that will promote and sustain positive guest/customer relationships
4. Apply concepts of digital marketing to hospitality organizations.

HRTM 505. Hospitality Research Methods & Analysis**3 Credits (3)**

Application of appropriate statistical procedures and research methodologies within the hospitality industry. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Analyze hospitality operational data.
2. Develop the framework for researching hospitality operations and organizations.
3. Implement appropriate statistical procedures and research methodologies to hospitality operations.
4. Examine problems in hospitality, formulate and clarify research topics to address these problems

HRTM 506. Contemporary Global Issues in Hospitality**3 Credits (3)**

Contemporary issues confronting the global hospitality industry. Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Discuss contemporary issues confronting the global hospitality industry.
2. Project how contemporary global issues will impact hospitality organizations.
3. Evaluate new developments in hotel and restaurant management

HRTM 510. Hospitality Cost Control**3 Credits (3)**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers). Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. Same as HRTM 410 with additional work for graduate credit. Consent of Instructor required.

HRTM 511. Hospitality Financial Analysis**3 Credits (3)**

Financial and accounting decision processes as applied to the hospitality industry. Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Use the Uniform Systems of Accounts for the Lodging and Restaurant industries, and accounting and financial reporting standards and procedures for the hospitality industry.
2. Use hospitality financial and accounting tools such as REVPAR and Food Cost Percentage to analyze hospitality operations
3. Define and apply terminology and principles required to develop and analyze Hospitality Management financial statements.
4. Analyze and interpret hospitality accounting and financial statements
5. Perform financial and accounting decision making as applied to the hospitality industry.

HRTM 512. Beverage Management**3 Credits (3)**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. Same as HRTM 412 with additional work for graduate credit. Consent of Instructor required.

HRTM 515. Applied Management Project**3 Credits (3)**

Students will develop a project scope based on problems presented within the hospitality industry. Projects incorporate concepts and skills developed in previous coursework. Students will take this course in their last semester of the Master of Hospitality Degree. Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Develop a project scope based on problems presented within the hospitality industry.
2. Use collaborative problem solving to execute the project.
3. Define and identify a business research problem and explain its importance to study.
4. Identify sources and strategies for locating related literature.
5. Plan research regarding the business problem.
6. Write the professional paper.
7. Present the professional paper.

HRTM 516. Hotel, Restaurant and Tourism Industry Purchasing, Selection and Procurement**3 Credits (3)**

Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment.

Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 530. Facilities Management**3 Credits (3)**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant. Same as HRTM 430 with additional work for graduate credit. Consent of Instructor required.

HRTM 531. Hotel Operations II**3 Credits (3)**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. Same as HRTM 431 with additional work for graduate credit. Consent of Instructor required.

HRTM 532. Hotel Revenue and Sales Management**3 Credits (3)**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. Same as HRTM 432 with additional work for graduate credit. Consent of Instructor required.

HRTM 535. Resort Management**3 Credits (3)**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities.

Prerequisite(s): Consent of instructor.

HRTM 536. Sustainability in the Hospitality Industry**3 Credits (3)**

This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry.

Learning Outcomes

1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 543. Meetings, Conventions and Special Events**3 Credits (3)**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. Same as HRTM 443 with additional work for graduate credit. Consent of Instructor required.

HRTM 546. Methods for Teaching Hospitality and Culinary Education**3 Credits (3)**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Compare and contrast curriculum theories.
2. Develop syllabi for hospitality courses using theories and models of course design.
3. Apply instructional techniques in hospitality education.
4. Design tests and other assessments for hospitality courses.
5. Write a teaching philosophy.

HRTM 550. The World of Hospitality Higher Education**3 Credits (3)**

Survey of the history, organization, and administration of hospitality higher education programs. Explores differences between types of degree programs – associate, bachelor, graduate and sources of funding – public, private, proprietary. Investigates the role of the faculty member in non-instructional activities, such as working with administrative and support departments, accreditation, service, community outreach, fundraising, and industry relations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Discuss the history of higher education and hospitality management programs.
2. Analyze how general higher education principles, laws, and finance apply to hospitality management programs.
3. Compare the characteristics, administration, and operations of programs based on type of degrees offered.
4. Compare the characteristics, administration, and operations of programs based on sources of funding.
5. Analyze the role of the faculty in hospitality education in collaborating with various educational departments and support services.
6. Analyze the role of the faculty in hospitality education in collaborating with external stakeholders.

HRTM 590. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

Prerequisite: consent of instructor.

HRTM 598. Special Research Programs**1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

Prerequisite: consent of instructor.

HRTM 599. Master's Thesis**1-6 Credits (1-6)**

Thesis.

Prerequisite: consent of instructor.

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Hotel, Restaurant and Tourism Management - Bachelor of Science

Core Courses

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1350G	Introduction to Statistics ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
ECON 1110G	Survey of Economics	
HRTM 1120G	Introduction to Tourism	
Area III: Laboratory Sciences Course (4 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i> ²		3-4
Any "G" course, excluding Area I and crosslisted courses		
Viewing A Wider World ³		6
Departmental/College Requirements		
HRTM 1130	Introduction to Hospitality Management	3
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
HRTM 2130	Hotel Operations I	3
HRTM 301	Hotel, Restaurant, and Tourism Marketing	3
HRTM 302	Hospitality Management Accounting	3
HRTM 304	Hospitality and Travel Law	3
HRTM 307	Professional Development	1
HRTM 311	Hospitality Leadership Management	3
HRTM 363	Quantity Food Production and Service	4
HRTM 408	Hospitality Internship	1
HRTM 409	HRTM Internship Seminar	1
HRTM 410	Hospitality Cost Control	3
HRTM 430	Hospitality Facilities Management	3
HRTM 434	Senior Capstone Experience ⁴	3
<i>Departmental Electives</i>		12
<i>Select 12 credits of Professional Departmental Electives in consultation with your HRTM Faculty Mentor</i> ⁵		
Non- Departmental Requirements (in addition to Gen.Ed/VWW) ⁶		

ACES 1120	Freshman Orientation	1
ACCT 2110	Principles of Accounting I	3
Any MKTG #300 and above		3
MGMT 309	Human Behavior in Organizations	3
MGMT 332	Human Resources Management	3
Electives, to bring the total credits to 120^{6, 7}		19
Total Credits		120-121

¹ MATH 1350G Introduction to Statistics is required for the degree but students may need to take any prerequisites needed to enter MATH 1350G first.

² See the General Education (p. 220) section of the catalog for a full list of courses. Please consult your HRTM faculty mentor to select appropriate courses.

³ Viewing A Wider World Requirement - Two courses in two different colleges, with at least one from outside ACES. See list of approved courses in the catalog. (300+ level courses with a "V" behind them.) See the Viewing a Wider World (p. 224) section of the catalog for a full list.

⁴ Complete during final semester.

⁵ **Departmental Electives (the following are typical offerings):**

- HRTM 412 Beverage Management
- HRTM 413 Restaurant Operations Management
- HRTM 414 Wine Appreciation
- HRTM 416 Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
- HRTM 420 Club Management and Marketing
- HRTM 431 Hotel Operations II
- HRTM 432 Hotel Revenue and Sales Management
- HRTM 435 Resort Management
- HRTM 436 Sustainability in the Hospitality Industry
- HRTM 443 Meetings, Conventions and Special Events
- HRTM 444 Entertainment Business and Venue Management
- HRTM 450 Special Topics
- HRTM 492 Special Problems

⁶ It is highly recommended that students take BFIN 341 Financial Analysis and Markets as an elective course. You will need assistance from HRTM to receive a prerequisite waiver to enroll in it.

⁷ It is strongly suggested that students use their elective credits to earn a minor such as Marketing, Business Administration, Food Science and Technology, Human-Animal Interaction, or a Language.

**Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
HRTM 1130	Introduction to Hospitality Management	3
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
ACES 1120	Freshman Orientation	1
MATH 1215	Intermediate Algebra	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Choose any General Education course from Area V or VI ^{2, 3}		3
Credits		14
Spring		
HRTM 1120G	Introduction to Tourism	3
ENGL 1110G	Composition I	4
ECON 1110G	Survey of Economics	3
Any General Education from Area V or Area VI ^{2, 3}		3
Elective Course ⁴		3
Credits		16
Second Year		
Fall		
HRTM 2130	Hotel Operations I	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
MATH 1350G	Introduction to Statistics ¹	3
General Education Elective ²		3
Area III: Laboratory Science Course ²		4
Credits		16
Spring		
HRTM 2120	Food Production and Service Fundamentals	3
HRTM 311	Hospitality Leadership Management	3
ACCT 2110	Principles of Accounting I	3
Any 300-level Marketing Course		3
Elective Course ⁴		3
Credits		15
Third Year		
Fall		
HRTM 301	Hotel, Restaurant, and Tourism Marketing	3
HRTM 302	Hospitality Management Accounting	3
HRTM 363	Quantity Food Production and Service	4
Any Viewing a Wider World course ⁵		3
Elective Course ⁴		3
Credits		16
Spring		
HRTM 304	Hospitality and Travel Law	3
HRTM 307	Professional Development	1
MGMT 332	Human Resources Management	3
Any HRTM Departmental Elective ⁶		3

Any Viewing a Wider World course ⁵	3
Credits	13
Summer	
HRTM 408 Hospitality Internship	1
Credits	1
Fourth Year	
Fall	
HRTM 409 HRTM Internship Seminar	1
HRTM 410 Hospitality Cost Control	3
HRTM 430 Hospitality Facilities Management	3
MGMT 309 Human Behavior in Organizations	3
HRTM Departmental Elective ⁶	3
Elective Course ⁴	3
Credits	16
Spring	
HRTM 434 Senior Capstone Experience	3
Departmental Elective Courses ⁶	6
Elective Courses (if needed to reach 120 credits) ⁴	4
Credits	13
Total Credits	120

¹ MATH 1215 Intermediate Algebra is the required prerequisite for MATH 1350G, is students place directly into MATH 1350G Introduction to Statistics then they can take an elective in it's place.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Students must take only one Area V and one Area VI course.

⁴ It is strongly suggested that students use their elective credits to earn a minor such as Marketing, Business Administration, Food Science and Technology, Human-Animal Interaction, or a Language.

**Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁶ **Departmental Electives (the following are typical offerings):**

- HRTM 412 Beverage Management
- HRTM 413 Restaurant Operations Management
- HRTM 414 Wine Appreciation
- HRTM 416 Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
- HRTM 420 Club Management and Marketing
- HRTM 431 Hotel Operations II
- HRTM 432 Hotel Revenue and Sales Management
- HRTM 435 Resort Management
- HRTM 436 Sustainability in the Hospitality Industry
- HRTM 443 Meetings, Conventions and Special Events
- HRTM 444 Entertainment Business and Venue Management
- HRTM 450 Special Topics
- HRTM 492 Special Problems

Hotel, Restaurant and Tourism Management - Undergraduate Minor

A minor in the School of Hotel, Restaurant and Tourism Management consists of 18 or more credit hours of approved course work of which at least 12 must be numbered 300 or higher: all completed with a grade of "C-" or higher.

Please see the HRTM Director or a HRTM Faculty Mentor to approve your plan for completing the minor and approval to take specific classes. Please declare the HRTM minor in MyNMSU as soon as possible so we can track your progress toward completion

Requirements

Prefix	Title	Credits
Required Courses:		
HRTM 1130	Introduction to Hospitality Management	3
HRTM 302	Hospitality Management Accounting	3
Choose one additional HRTM course (200-level):		3
HRTM 1120G	Introduction to Tourism	
HRTM 2130	Hotel Operations I	
HRTM 2120	Food Production and Service Fundamentals	
Choose nine credits of 300- or 400-level courses:		9
HRTM 301	Hotel, Restaurant, and Tourism Marketing	
HRTM 304	Hospitality and Travel Law	
HRTM 307	Professional Development	
HRTM 311	Hospitality Leadership Management	
HRTM 363	Quantity Food Production and Service	
HRTM 408	Hospitality Internship	
HRTM 409	HRTM Internship Seminar	
HRTM 410	Hospitality Cost Control	
HRTM 412	Beverage Management	
HRTM 413	Restaurant Operations Management	
HRTM 414	Wine Appreciation	
HRTM 416	Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement	
HRTM 420	Club Management and Marketing	
HRTM 430	Hospitality Facilities Management	
HRTM 431	Hotel Operations II	
HRTM 432	Hotel Revenue and Sales Management	
HRTM 435	Resort Management	
HRTM 436	Sustainability in the Hospitality Industry	
HRTM 443	Meetings, Conventions and Special Events	
HRTM 444	Entertainment Business and Venue Management	
HRTM 450	Special Topics	
HRTM 492	Special Problems	
Total Credits		18

Please note that ACCT 2110 Principles of Accounting I is the prerequisite for HRTM 302 Hospitality Management Accounting but does not count toward the minor. HRTM 2110 Safety, Sanitation and Health in the Hospitality Industry or a ServSafe Food Safety Manager certificate is a prerequisite for HRTM 2120 Food Production and Service Fundamentals and HRTM 363 Quantity Food Production and Service but does not count toward the minor. Other courses have prerequisites that you may not have taken.

Students wishing to perform a HRTM internship as part of the minor must take the full sequence of internship courses: HRTM 307 Professional Development, HRTM 408 Hospitality Internship, and HRTM 409 HRTM Internship Seminar.

Water Science and Management Graduate Program Information

New Mexico faces serious challenges concerning the supply, development, quality, management and administration of water resources; responses to the challenges will have major impacts on the regional economy, environmental quality, and the quality of life of the residents of New Mexico. A major need exists to train the next generation of water resource researchers, educators, and managers to address these challenges, both inside and outside New Mexico. To help meet these needs, an interdisciplinary program in Water Science & Management (WSM) has been developed at NMSU by the departments of

- Agricultural Economics and Agricultural Business,
- Animal and Range Science,
- Civil Engineering,
- Geography, and
- Plant and Environmental Sciences.

The primary purposes of the interdisciplinary masters and doctoral degree programs in WSM are to provide graduate education for addressing state, national, and international water issues, and to train the next generation of water professionals needed to meet the challenges noted above.

Admission Requirements

Admission Requirements for the Master of Science (MS) in water science and management include all general requirements for a graduate degree as set forth in the NMSU Catalog, plus the following:

- Possession of a bachelor's degree from an accredited university grade point average of 3.5 or higher on a 4.0 scale. However, students with grade point averages between 3.0 and 3.5 will be given consideration, this degree being preparatory to the Water Science and Management degree.
- A letter of intent or statement of purpose that addresses individual professional and personal goals related to water science and management and discusses how these goals fit within the degree programs at NMSU. It is expected that the candidate will have made contact with prospective advisor(s) at NMSU and speak to how he or she would work with said advisor(s) to advance their research and study.
- Three letters of recommendation submitted directly from persons who know the applicant professionally, including a recommendation from the candidate's current employer/sponsor. These letters should provide evidence of professional ability, research experience and the potential for professional development.
- A brief resume or curriculum vitae not to exceed five pages that summarize the candidate's background and qualifications.

Admission Requirements for the Doctor of Philosophy (Ph.D.) in water science and management include all general requirements for a graduate degree as set forth in the NMSU Catalog, plus the following:

- Possession of a master's degree from an accredited university with a grade point average of 3.5 or higher on a 4.0 scale. However,

students with grade point averages between 3.0 and 3.5 will be given consideration. This degree being preparatory to the Water Science and Management doctorate.

- Three letters of recommendation submitted directly from persons who know the applicant professionally, including a recommendation from the candidate's current employer/sponsor. These letters should provide evidence of professional ability, research experience, and the potential for professional development.
- In addition, applicants to the Ph.D. program should provide evidence of research experience. This could include a master's thesis, a professional paper, peer-reviewed manuscripts, consulting reports, or other evidence of experience conducting research.
- A letter of intent or statement of purpose that addresses individual professional and personal goals related to water science and management and discusses how these goals fit within the degree programs at NMSU. It is expected that the candidate will have made contact with prospective advisor(s) at NMSU and speak to how he or she would work with said advisor(s) to advance their research and study.
- A brief resume or curriculum vitae not to exceed five pages that summarize the candidate's background and qualifications.

Water Science & Management Graduate Courses

To view the list of core courses required for our Master of Science and Doctor of Philosophy degrees please see the Degrees (p. 423) tab.

Five (5) concentrations are offered in the program and are detailed on the program page:

- **Agricultural Water Resources** relates to the major use of ground and surface water in providing safe and secure food systems while ensuring ecosystem services. This field of study includes water allocation, water conservation and water management issues facing urban water supply and irrigated agriculture.
- **Watershed, Riparian and Aquatic Systems** includes the processes of organizing and guiding land and other resources used in a river basin to provide desired goods and services without adversely affecting soil and water resources. Watershed, riparian, and aquatic system management involves an array of nonstructural (vegetation management) practices, as well as an array of structural (engineering) activities, when conditions warrant.
- **Water Quality and Treatment** includes processes used to make water acceptable for desired end-uses. These can include use as drinking water, industrial processes, agricultural uses and environmental management. The goal of water treatment processes is to remove existing contaminants in the water or reduce the concentration of such contaminants so the water becomes fit for its desired end-use.
- **Water Economics and Policy** examines the demand for water by all its competing uses, including irrigated agriculture, energy, urban supply, and environmental restoration and management. Policies are examined for their influence on water supplies, water demands, and economic values of water reallocations among agricultural, environmental, energy, and urban users. It examines the role of water markets, water user decisions, institutional adjustments, and water-related policies with respect to resource costs, water quality, profitability, and environmental effects.
- **Water Informatics** is an interdisciplinary science primarily concerned with the collection, classification, manipulation, storage, retrieval and especially the dissemination of water information, including both human and machine readable documents. Examples of human readable documents include maps, field data sheets, operational

schedules, and long term asset management plans with narrative text. Machine readable documents include files for geographic information systems (GIS), Global Positioning Systems (GPS), relational database management systems and emerging applications.

Degrees for the Department

Master Degree(s)

- Water Science and Management (Agricultural Water Resources) - Master of Science (p. 169)
- Water Science and Management (International Water Resilience) - Master of Science (p. 170)
- Water Science and Management (Water Economics and Policy) - Master of Science (p. 170)
- Water Science and Management (Water Informatics) - Master of Science (p. 171)
- Water Science and Management (Water Quality and Treatment) - Master of Science (p. 172)
- Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science (p. 172)
- Water Science and Management - Master of Science (p. 168)

Doctoral Degree(s)

- Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy (p. 201)
- Water Science and Management (International Water Resilience) - Doctor of Philosophy (p. 201)
- Water Science and Management (Water Economics and Policy) - Doctor of Philosophy (p. 202)
- Water Science and Management (Water Informatics) - Doctor of Philosophy (p. 202)
- Water Science and Management (Water Quality Treatments) - Doctor of Philosophy (p. 203)
- Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy (p. 203)
- Water Science and Management - Doctor of Philosophy (p. 200)

Affiliated Faculty – S. Angadi, Ph.D. (University of Manitoba, Canada); S. Archambault, Ph.D. (UNM); A. Salim Bawazir, Ph.D. (NMSU); M.P. Bleiweiss, M.S. (California State-Los Angeles); W. Boeing, Ph.D. (Louisiana State); K. Boykin, Ph.D. (NMSU); C. E. Brewer, Ph.D. (Iowa State); C. Brown, Ph.D. (San Diego State/California-Santa Barbara); S. W. Brown, Ph.D. (NMSU); M. Buenemann, Ph.D. (Oklahoma); K. C. Carroll, Ph.D. (Arizona); D. S. Cram, Ph.D. (NMSU); C. M. Downes, Ph.D. (New Mexico); D. W. DuBois, Ph.D. (Nevada); D. P. Dugas, Ph.D. (Oregon); W. M. Fedio, Ph.D. (University of Alberta, Canada); A. G. "Sam" Fernald, Ph.D. (Colorado State); R. Flores, Ph.D. (Kansas State); R. Foudazi, Ph.D. (Cape Peninsula University of Technology, South Africa); A. Ghassemi, Ph.D. (NMSU); R. M. Goss, Ph.D. (Nebraska); S. J. Guldán, Ph.D. (Minnesota); P. Gutierrez, Ph.D. (Oklahoma State University); J. Herrick, Ph.D. (Ohio State); B. H. Hurd, Ph.D. (California-Davis); M. D. Johnson, Ph.D. (NMSU); N. Khandan, Ph.D. (Drexel University); J. P. King, Ph.D. (Colorado State); S. Langarudi, Ph.D. (Worcester Polytechnic); A. S. Lara, Ph.D. (NMSU); B. Leinauer, Ph.D. (Hohenheim University, Germany); H. Luo, Ph.D. (Tulane); L. Papelis, Ph.D. (Stanford); G. A. Picchioni, Ph.D. (Texas A&M); R. C. Pratt, Ph.D. (Purdue); D. A. Rockstraw, Ph.D. (Oklahoma); R. Sallenave, Ph.D. (University of Guelph, Canada); Z. A. Samani, Ph.D. (Utah State); M. K. Shukla, Ph.D. (University of Agricultural Sciences-Vienna, Austria); G. Sims, Ph.D. (Purdue); G. B. Smith, Ph.D. (North Carolina State); R. G. Smits, Ph.D.

(Purdue); S. N. Smirnov, Ph.D. (Novosibirsk University, Russia); R. St. Hilaire, Ph.D. (Iowa State); C. M. Steele, Ph.D. (King's College, University of London, UK); K. Stevens, M.S. (NMSU); B. L. Stringam, Ph.D. (Utah State); A. L. Ulery, Ph.D. (California-Riverside); J. Urquidi, Ph.D. (Texas Tech); F. A. Ward, Ph.D. (Colorado State); N. Webb, Ph.D. (University of Queensland, Australia); B. Widner, Ph.D. (Colorado State); P. Xu, Ph.D. (Ecole Nationale de Genie Rural, France)

Water Science and Management Courses

WSAM 470. Environmental Impacts of Land Use and Contaminant Remediation

3 Credits (3)

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: ENVS 470.

WSAM 550. Special Topics

1-4 Credits (1-4)

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.

Learning Outcomes

1. Readings, discussions, and/or field and laboratory investigation of selected problems.

WSAM 551. Earth Data Retrieval

3 Credits (3)

This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: RGSC 551.

WSAM 575. Climate Studies, Water and Society

3 Credits (3)

The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies. Crosslisted with: RGSC 575.

WSAM 585. Land Cover Analysis for Natural Resources**3 Credits (3)**

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: RGSC 585.

WSAM 589. Landscape Hydrology Modeling**3 Credits (3)**

Understand the landscape scale of hydrologic cycle and related hydrological processes. Quantitatively evaluate hydrological system components. Retrieve, visualize and model some of the physical processes using some of the available tools. Consent of Instructor required.

WSAM 590. System Dynamics**3 Credits (3)**

This course takes a system dynamics approach to the study of economics and natural resources management. We will examine some of the example theories such as Solow-Swan model and endogenous growth theories as well as the tragedy of the commons, using system dynamics tools to uncover the feedback and explicitly examine its impact on the dynamic behavior of the system. Through these examples, we will learn how to develop, validate, and use system dynamics models for policy design and analysis. Crosslisted with: RGSC 590.

Learning Outcomes

1. identify common generic structures and behavioral modes in socioeconomic and ecological systems,
2. define important feedback theories that explain the behavioral modes in socioeconomic and ecological systems, and
3. implement the system dynamics method to translate the feedback theories into dynamic simulation models.

WSAM 595. Hands-On Transboundary Aquifer and Community System Convergence Seminar**1 Credit (1)**

An opportunity for graduate researchers to build partnerships with their colleagues in the IWR cohort and with our expert collaborators. Graduate researchers present their research methods, share lessons from their research activities, and report on experiences in the field and in the IWR program. An opportunity for academic, industry, and stakeholder project partners to share career development and research convergence insight with the cohort. May be repeated up to 18 credits.

Learning Outcomes

1. Students will learn about natural and social science convergence.
2. Convergence tool skill-building.
3. Students will learn how to lead the coordination of international, multidisciplinary research collaboration.

WSAM 598. Internship**1-9 Credits (1-9)**

Out-of-classroom learning experiences to gain relevant education, experience, and expertise. Field-based learning providing transformative education and hands-on training. May be repeated up to 18 credits.

Learning Outcomes

1. Gain the experience necessary to engage confidently in community-centered hydrologic and social science approaches to water research.
2. Students will learn how to lead the coordination of international, cross-disciplinary research collaboration.
3. Gain experience applying academic and research knowledge in professional capacities.
4. Develop cross-sector communication skillsets.

WSAM 599. Masters Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits. Consent of Instructor required. Restricted to: Water and Science Management majors. Thesis/Dissertation Grading.

WSAM 600. Doctoral Research**1-15 Credits (1-15)**

Assigned credit for research preformed. May be repeated up to 15 credits. Consent of Instructor required.

Learning Outcomes

1. Identify appropriate research methodologies.
2. Reflect on their own research, identifying lessons learned, strengths, and ways to improve.
3. Communicate confidently and constructively with faculty advisors.

WSAM 605. Arid Land Water Resources**3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. May be repeated up to 3 credits. Crosslisted with: ENVS 605.

WSAM 610. Water and Sustainable Economic Development**3 Credits (3)**

For graduate students in the Water Science and Management or other research degree programs, use the water economics literature as a model for student research leading to an M.S. thesis or Ph.D. dissertation.

WSAM 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation for Water Sciences and Management Majors May be repeated up to 88 credits. Restricted to: Water Sciences and Management majors. Thesis/Dissertation Grading.

Office Location: Stucky Hall Room 111

Phone: (575) 646-4198

Email: wsm@nmsu.edu

Website: <http://wsm.nmsu.edu> (<https://wsm.nmsu.edu/>)

Coordinating Institute

- New Mexico Water Resources Research Institute, (575) 646-4337

Sponsoring Departments

- *Agricultural Economics and Agricultural Business*, (575) 646-3215, <https://aeab.nmsu.edu/>
- *Animal and Range Sciences*, (575) 646-2514, <https://anrs.nmsu.edu>
- *Civil Engineering*, (575) 646-3801, <http://ce.nmsu.edu>
- *Geography*, (575) 646-3509, <http://geography.nmsu.edu>
- *Plant and Environmental Sciences*, (575) 646-3405, <http://aces.nmsu.edu/academics/pes> (<http://aces.nmsu.edu/academics/pes/>)

College of Arts and Sciences

Dean - Enrico Pontelli

Associate Dean (Research) - James Murphy

Associate Dean (Academics) - Joseph Lakey

Executive Administrative Assistant - Marissa Holguin

Business Manager - Lucille Casas

Undergraduate programs offered in the College of Arts and Sciences prepare students for a variety of career opportunities and for graduate study. The broad curriculum offered provides both the motivation and the tools for lifelong learning experiences.

While the ultimate responsibility for planning an academic program in compliance with university, college and departmental requirements rests with the student, the college recognizes the importance of helping students navigate appropriate academic programs.

Students should consult the "Academic Regulations (p. 31)" section of the catalog regarding general limitations for total credit hours, independent study and registration under S/U option, registration deadlines, and conditions required to make academic progress and maintain good academic standing. Students may not revise or do additional course work after the semester has ended in order to raise a grade in any course. Exceptions will be made for students completing an official Incomplete grade.

College Undergraduate Degree Requirements

1. In accordance with NMSU policy, students in all majors in the College of Arts and Sciences must meet the Basic Academic Skills requirements in English and Mathematics prior to enrolling in upper division courses numbered 300 or higher. See "Basic Academic Skills (p. 31)" under Performance/Progress in the NMSU System Academic Regulations & Policies section.
2. University graduation requirements. See "Graduation/Commencement (p. 31)" in the Regulations & Policies section. In order to graduate, undergraduate students must have met all degree requirements for their program, earned a minimum of 120 university level credits, or more if required for the degree, of which at least 48 must be upper division (except for the Bachelor of Applied Studies, which requires 36 upper division credits) and must have a cumulative GPA of 2.0 in all courses taken at NMSU. Each student must complete at least 30 of the necessary credits for their Bachelor Degree at NMSU. A minimum of "C-" in all courses counting toward the major, supplemental major and minor is required of all students.

S/U Grading Option for Undergraduate Students

Instructors may establish individual standards for an S grade, but the minimum standard for an S grade in the College of Arts and Sciences courses is a C-.

Developmental and Applied Credit Limitations for Undergraduate Students

The College of Arts and Sciences will accept all applied coursework, which includes Occupational Education courses, BOT, FDMA, FYEX (not including FYEX 1112 The Freshman Year Experience and UNIV 350 Peer Education), ARTS/ARTH (applied), DANC (applied), MUSC (applied and participation), THEA (applied), NURS, A EN, AXED, and AECC. These courses count towards overall credit hours to bring the student's total to the minimum credit hours required. Students must still complete all university requirements: General Education; Viewing a Wider World; the required number of upper division credits, as well as all requirements for their declared major degree. Students should contact their Arts and Sciences Student Records Specialist regarding the acceptability of specific courses.

Independent Study/Directed Reading Courses for Undergraduate Students

Students are limited to six credits in any independent study course. Independent study courses include directed reading and special topic courses, which do not carry a subtitle.

Majors, Minors and Supplementary Majors for Undergraduate Students

Except for the Bachelor of Applied Studies and Bachelor of Individualized Studies, students who wish to obtain a bachelor's degree must select a major field or fields. For a listing of majors, the student should refer to the list of majors in this catalog. Course requirements for majors are listed under individual departments. Students should consult the department with any questions about requirements. Until a major is selected, the student is designated as undeclared.

Each major consists of not less than 24 credits in the major field, of which 18 or more must be in upper-division courses (300 and above). Some departments also require specific courses outside the major field. Please refer to the departmental section of the catalog for specific nondepartmental requirements. Students must earn a grade of C- or better for all course requirements indicated for each major, minor, or supplementary major, including any nondepartmental courses required. Students may not count an S grade towards completion of any major, minor or supplementary major requirement unless a course is automatically S/U for all enrolled students. A student may not earn a minor that bears the same name as a bachelor's degree that the student is earning. (For example, a student earning a B.S. in Biology cannot also earn a minor in Biology.) It is imperative that students consult the departmental sections of this catalog and the department(s) for advice in planning to fulfill requirements for their declared majors. The requirements for academic minors in the College of Arts and Sciences are found under each offering department or program section of this catalog.

Supplementary Majors

Requirements for supplementary majors are found as follows:

- the Supplementary Majors in Chicano Studies, Latin American Studies, and Linguistics (p. 709) are listed under Languages and Linguistics (p. 709);

- the Supplementary Major in Law and Society (p. 669) is listed under Government (p. 669); and
- the Supplementary Major in Applied Mathematics (p. 748) is listed under Mathematical Sciences (p. 748).

Most students have considerable latitude in choosing elective courses. These are the courses beyond university and major requirements that a student must take to bring her or his total credits to the minimum overall credits required for the degree. This latitude provides students with opportunities to major in more than one field, to take a minor or to devise interdisciplinary programs tailored to individual interests or future career needs.

Regardless of the option elected, students should consult regularly with an advisor and track their progress towards degree completion and graduation using the online degree audit system STAR (Student Academic Requirements), at: <http://www.myNMSU.edu> (<https://my.nmsu.edu>).

Preprofessional Studies

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. Several programs in the College of Arts and Sciences provide preparation for Law and Health professions.

- Pre-Health Professions advising is coordinated by the Center for Academic Advising and Student Support (CAASS).
- Pre-Law advising is coordinated by the Department of Government. Students interested in attending law school must first obtain a bachelor's degree but that degree can be in any subject. Many pre-law students take some law courses in their undergraduate program; law related courses are taught in government, philosophy, criminal justice and other departments. The Department of Government coordinates the interdisciplinary Supplementary Major in Law and Society. See the NMSU Department of Government webpage. The Department of Philosophy offers both a major and a minor in Justice, Political Philosophy, and Law. See the NMSU Department of Philosophy webpage.

Bachelor of Applied/Individualized Studies

The Interdisciplinary Studies Department extends New Mexico State University's reach beyond traditional academic programs to provide educational opportunities for students to meet their academic, professional, and personal learning goals. The Interdisciplinary Studies Department offers flexible degree programs in the **Bachelor of Applied Studies (BAS)** and the **Bachelor of Individualized Studies (BIS)**, giving students the opportunity to work with an advisor to develop their own interdisciplinary program, appropriate to their unique educational and career goals.

The Bachelor of Applied Studies is a program designed for those students who have procured an Associates of Applied Studies (AAS) at a community or two-year college. This major allows students to transfer credits and build from their Associates degree toward a university-level degree. The BAS degree helps minimize credits for associate degree graduates when pursuing a baccalaureate degree at NMSU by requiring a fewer number of upper-division credits: requiring 36 as opposed to the 48 upper-division courses required of other majors. The aim is to equip students to effectively build from their applied backgrounds and knowledge to shift careers or to advance in their chosen career.

The Bachelor of Individualized Studies is a flexible degree program serving multiple needs. It can be designed to serve students desiring

an academic degree not offered at NMSU, particularly students with broad or diverse academic and career interests. It can also allow students to complete a college degree when an initial major does not fit as well as planned. Its flexibility in accepting course credits also serves as a completion program for students who left college and now want to return to earn a Bachelor degree. A well-designed interdisciplinary curriculum emphasizes the value of approaching complex issues from multiple perspectives, equipping students with the requisite critical and analytical skills to become effective problem solvers in a chosen career.

Minors Recommended for BAS & BIS Majors

Students seeking a **Bachelor of Applied Studies** or the **Bachelor of Individualized Studies** degree are encouraged to complete one or more minors offered through various NMSU colleges. A minor is designated on a transcript and consists of a minimum of 18 credits, nine of which must be upper-division. Courses required to complete a minor may be in a single department or interdepartmental, are offered through various NMSU colleges, and are subject to availability. Students seeking to complete a minor must have the minor verified, prior to graduation, by the college academic department administering the minor. Specific requirements for minors may be obtained from the academic department administering a specific minor, the academic department's college dean's office, and in the college departmental listings of this catalog. **Note: The NMSU College of Business allows a maximum of 30 business credit hours (excluding MATH 1350G) to count towards the BAS or BIS degrees. Also, the only College of Business minor allowed for these degrees is the Business Administration Minor.**

Bachelors Degrees

A

- Animation and Visual Effects - Bachelor of Creative Media (p. 596)
- Anthropology (Culture & Language) - Bachelor of Arts (p. 453)
- Anthropology - Bachelor of Arts (p. 450)
- Applied Studies - Bachelor of Applied Studies (<http://catalogs.nmsu.edu/nmsu/arts-sciences/applied-studies-bachelor-applied-studies/>)
- Applied Studies - Bachelor of Applied Studies (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/applied-studies-bas-online/>)
- Art (Art History) - Bachelor of Arts (p. 474)
- Art (Museum Conservation) - Bachelor of Fine Arts (p. 477)
- Art (Studio Art) - Bachelor of Arts (p. 476)
- Art (Studio Art) - Bachelor of Fine Arts (p. 479)

B

- Biochemistry - Bachelor of Science (p. 524)
- Biology - Bachelor of Arts (p. 501)
- Biology - Bachelor of Science (p. 503)

C

- Chemistry - Bachelor of Arts (p. 526)
- Chemistry - Bachelor of Science (p. 529)
- Communication Studies - Bachelor of Arts (p. 539)
- Communication Studies - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-disorders-ba-online/>)
- Computer Science (Algorithm Theory) - Bachelor of Science (p. 566)

- Computer Science (Artificial Intelligence) - Bachelor of Science (p. 568)
- Computer Science (Big Data and Data Science) - Bachelor of Science (p. 571)
- Computer Science (Computer Networking) - Bachelor of Science (p. 573)
- Computer Science (Cybersecurity) - Bachelor of Science (p. 576)
- Computer Science (Human Computer Interaction) - Bachelor of Science (p. 578)
- Computer Science (Software Development) - Bachelor of Science (p. 581)
- Computer Science - Bachelor of Arts (p. 561)
- Computer Science - Bachelor of Science (p. 563)
- Computer Science - Bachelor of Science/Master of Science (p. 585)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 505)
- Criminal Justice - Bachelor of Criminal Justice (p. 608)
- Criminal Justice - Bachelor of Criminal Justice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/criminal-justice-bcj-online/>)
- Cybersecurity - Bachelor of Science (p. 583)

D

- Digital Film Making - Bachelor of Creative Media (p. 599)

E

- Economics - Bachelor of Arts (p. 615)
- English (Creative Writing) - Bachelor of Arts (p. 633)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 637)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 639)
- English - Bachelor of Arts (p. 635)

F

- Foreign Languages (French) - Bachelor of Arts (p. 733)
- Foreign Languages (German) - Bachelor of Arts (p. 736)
- Foreign Languages (Spanish) - Bachelor of Arts (p. 738)

G

- Gender and Sexuality Studies - Bachelor of Arts (<http://catalogs.nmsu.edu/nmsu/arts-sciences/english/gender-sexuality-studies-ba/>)
- Gender and Sexuality Studies - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/gender-sexuality-studies-ba-online/>)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 507)
- Geography (Geographic Information Science & Tech) - Bachelor of Science (p. 650)
- Geography (Human/Environment Relationships) - Bachelor of Science (p. 652)
- Geology (Earth and Environmental Sciences) - Bachelor of Science (p. 660)
- Geology (Earth Science Education) - Bachelor of Science (p. 663)

- Geology (Geological Sciences) - Bachelor of Science (p. 666)
- Government - Bachelor of Arts (p. 678)

H

- History - Bachelor of Arts (p. 696)

I

- Individualized Studies - Bachelor of Individualized Studies (<http://catalogs.nmsu.edu/nmsu/arts-sciences/individualized-studies-bachelor-individualized-studies/>)
- Individualized Studies - Bachelor of Individualized Studies (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/individualized-studies-bis-online/>)

J

- Journalism and Media Studies - Bachelor of Arts (p. 704)
- Journalism and Media Studies - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/journalism-media-studies-ba-online/>)
- Justice, Political Philosophy, and Law - Bachelor of Arts (p. 802)

L

- Linguistics - Bachelor of Arts (p. 741)

M

- Mathematics (Actuarial Science and Insurance) - Bachelor of Science (p. 760)
- Mathematics (Applied Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/applied-mathematics-bachelor-science/>)
- Mathematics (Foundations) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/foundations-bachelor-science/>)
- Mathematics (General Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/general-bachelor-science/>)
- Mathematics (Probability and Statistics) - Bachelor of Science (p. 763)
- Mathematics (Secondary Mathematics Education) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/secondary-math-education-bachelor-science/>)
- Microbiology - Bachelor of Science (p. 509)
- Music (Instrumental Performance) - Bachelor of Music (p. 790)
- Music (Piano Performance) - Bachelor of Music (p. 791)
- Music (Pre-Music Therapy) - Bachelor of Arts (p. 784)
- Music (Pre-Speech Language Pathology) - Bachelor of Arts (p. 786)
- Music (Theatre) - Bachelor of Arts (p. 788)
- Music (Vocal Performance) - Bachelor of Music (p. 793)
- Music - Bachelor of Arts (p. 783)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 795)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 797)

P

- Philosophy - Bachelor of Arts (p. 804)
- Physics - Bachelor of Arts (p. 820)
- Physics - Bachelor of Science (p. 822)
- Psychology - Bachelor of Arts (p. 830)
- Psychology - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/psychology-ba-online/>)

T

- Theatre Arts (Musical Theatre) - Bachelor of Arts (p. 840)
- Theatre Arts - Bachelor of Arts (p. 838)

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- Anthropology - Master of Arts (p. 97)
- Art - Master of Arts (p. 100)
- Astronomy - Master of Science (p. 100)

B

- Bioinformatics - Master of Science (p. 104)
- Biology - Master of Science (p. 105)

C

- Chemistry - Master of Science (p. 117)
- Communication Studies (Analysis and Decision-Making) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-studies-analysis-decision-making-ma-online/>)
- Communication Studies (Leadership Communication) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-studies-leadership-communication-ma-online/>)
- Communication Studies - Master of Arts (p. 123)
- Computer Science - Master of Science (p. 124)
- Creative Writing - Master of Fine Arts (p. 125)
- Criminal Justice - Master of Criminal Justice (p. 125)
- Criminal Justice - Master of Criminal Justice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/criminal-justice-mcj-online/>)

D

- Data Analytics (Digital Agriculture) - Master of Data Analytics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/data-analytics-digital-agriculture-mda-online/>)
- Data Analytics - Master of Data Analytics (p. 126)
- Data Analytics - Master of Data Analytics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/data-analytics-mda-online/>)

E

- English (Technical and Professional Communication) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/english-technical-professional-communication-ma-online/>)
- English - Master of Arts (p. 141)
- Experimental Psychology - Master of Arts (p. 144)

F

- Fine Arts - Master of Fine Arts (p. 147)

G

- Geography - Master of Applied Geography (p. 149)
- Geology - Master of Science (p. 149)
- Government - Master of Arts (p. 149)

H

- History (Public History) - Master of Arts (p. 150)
- History - Master of Arts (p. 150)

M

- Mathematics - Master of Science (p. 154)
- Molecular Biology - Master of Science (p. 156)
- MPA-MCJ Program - Dual Degree (p. 157)
- Music (Conducting) - Master of Music (p. 157)
- Music (Music Education) - Master of Music (p. 157)
- Music (Music Education) - Master of Music (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/music-music-education-mm-online/>)
- Music (Performance) - Master of Music (p. 158)

P

- Physics (Space Physics) - Master of Science (p. 158)
- Physics - Master of Science (p. 158)
- Public Administration - Master of Public Administration (p. 159)
- Public History and Public Administration - Dual M.A. Degree (p. 163)

S

- Spanish - Master of Arts (p. 166)
- Spanish - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/spanish-ma-online/>)

Doctoral Degrees**A**

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B

- Biology - Doctor of Philosophy (p. 179)

C

- Chemistry - Doctor of Philosophy (p. 180)
- Computer Science - Doctor of Philosophy (p. 181)

E

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G

- Geography - Doctor of Philosophy (p. 192)

M

- Mathematics - Doctor of Philosophy (p. 195)
- Molecular Biology - Doctor of Philosophy (p. 196)

P

- Physics - Doctor of Philosophy (p. 198)

R

- Rhetoric and Professional Communication - Doctor of Philosophy (p. 199)

Supplemental Majors

- Applied Mathematics - Supplemental Major (p. 764)
- Chicano Studies - Supplemental Major (p. 746)
- Latin American Studies - Supplemental Major (p. 745)
- Law and Society - Supplemental Major (p. 682)
- Law and Society - Undergraduate Supplemental Major (p. 611)
- Linguistics - Supplemental Major (p. 747)
- Mathematics (Applied Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/applied-mathematics-bachelor-science/>)
- Mathematics (Foundations) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/foundations-bachelor-science/>)
- Mathematics (General Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/general-bachelor-science/>)
- Mathematics (Secondary Mathematics Education) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/secondary-math-education-bachelor-science/>)

Graduate Certificates

- Borderlands and Ethnic Studies - Graduate Certificate (p. 204)
- Cultural Resource Management - Graduate Certificate (p. 205)
- Museum Studies - Graduate Certificate (p. 207)

Undergraduate Minors

- Aerospace Studies - Undergraduate Minor (p. 431)
- Algorithm Theory - Undergraduate Minor (p. 586)
- American Government and Politics - Undergraduate Minor (p. 680)
- Animation and Visual Effects - Undergraduate Minor (p. 600)
- Anthropology - Undergraduate Minor (p. 456)
- Archaeology - Undergraduate Minor (p. 456)
- Art - Undergraduate Minor (p. 481)
- Art History - Undergraduate Minor (p. 481)
- Astronomy - Undergraduate Minor (p. 486)
- Biochemistry - Undergraduate Minor (p. 530)
- Bioinformatics - Undergraduate Minor (p. 586)
- Biology - Undergraduate Minor (p. 511)
- Chemistry - Undergraduate Minor (p. 531)
- Communication Studies - Undergraduate Minor (p. 541)
- Comparative Politics - Undergraduate Minor (p. 681)

- Computer Systems - Undergraduate Minor (p. 586)
- Conservation Ecology - Undergraduate Minor (p. 512)
- Creative Writing - Undergraduate Minor (<http://catalogs.nmsu.edu/nmsu/arts-sciences/creative-media/creative-writing-ug-minor/>)
- Digital Film Making - Undergraduate Minor (p. 601)
- East Asian Studies - Undergraduate Minor (p. 744)
- Economics - Undergraduate Minor (p. 617)
- English - Undergraduate Minor (p. 641)
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- French - Undergraduate Minor (p. 744)
- Gender & Sexuality Studies - Undergraduate Minor (<http://catalogs.nmsu.edu/nmsu/arts-sciences/english/gender-sexuality-studies-ug-minor/>)
- Genetics and Biotechnology - Undergraduate Minor (p. 512)
- Geographic Information Systems - Undergraduate Minor (p. 655)
- Geography - Undergraduate Minor (p. 655)
- Geology - Undergraduate Minor (p. 669)
- German - Undergraduate Minor (p. 744)
- Government - Undergraduate Minor (p. 681)
- History - Undergraduate Minor (p. 697)
- Human Biology - Undergraduate Minor (p. 512)
- International Relations - Undergraduate Minor (p. 681)
- International Studies - Undergraduate Minor (p. 744)
- Journalism and Media Studies - Undergraduate Minor (p. 709)
- Justice, Political Philosophy, and Law - Undergraduate Minor (p. 806)
- Linguistics - Undergraduate Minor (p. 745)
- Literature - Undergraduate Minor (p. 642)
- Mathematics (Applied Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/applied-mathematics-bachelor-science/>)
- Mathematics (Foundations) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/foundations-bachelor-science/>)
- Mathematics (General Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/general-bachelor-science/>)
- Mathematics (Secondary Mathematics Education) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/secondary-math-education-bachelor-science/>)
- Mathematics - Undergraduate Minor (p. 765)
- Medical Anthropology - Undergraduate Minor (p. 456)
- Medieval and Early Modern Studies - Undergraduate Minor (p. 642)
- Microbiology - Undergraduate Minor (p. 513)
- Military Science - Undergraduate Minor (p. 768)
- Molecular Biology - Undergraduate Minor (p. 770)
- Museum Conservation - Undergraduate Minor (p. 481)
- Music - Undergraduate Minor (p. 799)
- Philosophy - Undergraduate Minor (p. 806)
- Physics - Undergraduate Minor (p. 824)
- Political Theory - Undergraduate Minor (p. 681)
- Psychology - Undergraduate Minor (p. 832)

- Public Administration - Undergraduate Minor (p. 681)
- Public Law - Undergraduate Minor (p. 682)
- Religious Studies - Undergraduate Minor (p. 457)
- Rhetoric and Professional Communication - Undergraduate Minor (p. 643)
- Social Media Management - Undergraduate Minor (p. 709)
- Software Development - Undergraduate Minor (p. 586)
- Spanish - Undergraduate Minor (p. 745)
- Strategic Communications - Undergraduate Minor (p. 709)
- Sustainability- Undergraduate Minor (p. 457)
- Theatre Arts - Undergraduate Minor (p. 842)

Graduate Minors

- Anthropology - Graduate Minor (p. 212)
- Archaeology - Graduate Minor (p. 212)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 213)
- Communication Studies - Graduate Minor (p. 213)
- Computer Science - Graduate Minor (p. 213)
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- History - Graduate Minor (p. 215)
- Native American Studies - Graduate Minor (p. 217)
- Physics - Graduate Minor (p. 218)
- Psychology - Graduate Minor (p. 218)
- Security Studies - Graduate Minor (p. 218)
- In the College of Arts and Sciences, the Department of Chemistry and Biochemistry is accredited by the American Chemical Society.
- The Bachelor of Science in Computer Science is accredited by ABET.
- Music curricula in the Department of Music are accredited by the National Association of Schools of Music.
- The Master of Public Administration program in the Department of Government is accredited by the National Association of Schools of Public Affairs and Administration.

Aerospace Studies

Undergraduate Program Information

Air Force Reserve Officer Training Corps (AFROTC) is a nationwide program that allows students to pursue commissions (become officers) in the United States Air Force (USAF) while simultaneously attending college. AFROTC classes are held on college campuses throughout the United States and Puerto Rico; students can register through normal course registration processes. AFROTC consists of four years of Aerospace Studies classes (Heritage and Values of the United States Air Force, Team and Leadership Fundamentals, Leading People and Effective Communication, and National Security Affairs/Preparation for Active Duty), and a corresponding Leadership Laboratory for each year (where students apply leadership, demonstrate command and effective communication, develop physical fitness, and practice military customs and courtesies). College students enrolled in the AFROTC program (known as "cadets") who successfully complete both AFROTC training and college degree requirements will graduate and simultaneously commission as Second Lieutenants in the Active Duty Air Force.

Freshman and Sophomore Years (General Military Course or GMC)

This group provides a general background knowledge of the military establishment with emphasis on the Air Force. GMC courses may be taken out of sequence.

Prefix	Title	Credits
AERO 121	Heritage and Values	4
& AERO 122	and Heritage and Values II	
AERO 221	Team and Leadership Fundamentals	2
AERO 222	Team and Leadership Fundamentals II	2
Total Credits		8

Junior and Senior Years (Professional Officer Course or POC)

This group constitutes an in-depth study of topics that provides a broad preparation for a career as an Air Force officer. Students must have certain qualifications for entry and have a desire to be commissioned in the Air Force. These qualifications include, achieving a passing score on the Air Force Officer's Qualifying Test, passing a physical fitness test, and successfully completing a medical exam. They must also complete a four- or five-week summer orientation course.

Students may, with departmental approval, take POC courses out of normal sequence. However, compressed or dual enrollment in upper-division POC courses is normally prohibited. Through this department, you can also earn a minor in Aerospace Studies.

Prefix	Title	Credits
AERO 301	Leading People and Effective Communication	4
AERO 302	Leading People and Effective Communication II	4
AERO 401	National Security, Leadership Responsibilities and Commissioning Preparation	4
AERO 402	National Security, Leadership Responsibilities and Commissioning Preparation II	4
Total Credits		16

Leadership Laboratory

This is an integral and mandatory portion of the Aerospace Studies curriculum. Within the framework of the cadet wing, it provides a progression of experiences designed to develop each student's leadership potential and serves as an orientation to military life.

Minors for the Department

- Aerospace Studies - Undergraduate Minor (p. 431)

Lieutenant Colonel Dee Bochte, Department Head

Assistant Professors and Staff: Capt Brigitte Palacios, Capt Chris Kuennen, MSgt Crystal Brown, SSgt Mariah Rodriguez, and Ms. Patti Alarcon

Aerospace Studies Courses

AERO 121. Heritage and Values
2 Credits (1.25+2P)

"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 122. Heritage and Values II**2 Credits (1.25+2P)**

"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 221. Team and Leadership Fundamentals**2 Credits (1.25+2P)**

"Teams and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 222. Team and Leadership Fundamentals II**2 Credits (1.25+2P)**

"Team and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 223. Air Force Leadership Development**1 Credit (2P)**

This course prepares cadets to excel in field training. Cadets are prepared in all facets of field training, including: leadership competency evaluations, the Cadet's Guide to Field Training, individual drill evaluations, attention to detail, dining hall procedures, maintenance of living areas, and the group problem solving process. Restricted to: Main campus only.

AERO 301. Leading People and Effective Communication**4 Credits (3+2P)**

"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Includes Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 302. Leading People and Effective Communication II**4 Credits (3+2P)**

"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Include Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 401. National Security, Leadership Responsibilities and Commissioning Preparation**4 Credits (3+2P)**

"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, and AERO 301/AERO 302, or permission of instructor.

AERO 402. National Security, Leadership Responsibilities and Commissioning Preparation II**4 Credits (3+2P)**

"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, AERO 301/AERO 302, and AERO 401 or permission of instructor.

AERO 411. Aerospace Studies Independent Study**1 Credit (1)**

This course provides in-depth research on specified topics of the United States Air Force and NMSU's Detachment 505 history. Consent of instructor required.

Prerequisite(s): AERO 301, AERO 302, AERO 401, AERO 402.

Phone: (575) 646-2136

Website: <http://airforcerotc.nmsu.edu>

Aerospace Studies - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
AERO 301	Leading People and Effective Communication	4
AERO 302	Leading People and Effective Communication II	4
AERO 401	National Security, Leadership Responsibilities and Commissioning Preparation	4
AERO 402	National Security, Leadership Responsibilities and Commissioning Preparation II	4
Select two from the following, one must be Viewing the Wider World:		6
ECON 324V	Developing Nations	
ELAD 3110V	Introduction to Educational Leadership in a Global Society	
GEOG 361V	Challenges of Globalization	
GEOG 365V	The City	
HIST 343	Recent American Military History	
MGMT 388V	Leadership and Ethics	
POLS 360	International Relations Theory	
POLS 364	National Security	
POLS 367	Terrorism	

Anthropology

Anthropologists study the human species and our closest non-human relatives. We seek to understand the human condition in the past and present so that we can shape our future.

Undergraduate Program Information

Anthropology is the study of humankind, a multidisciplinary endeavor that crosses the usual divides between social sciences, natural sciences, and humanities. In order to tackle this complicated subject from different angles, the discipline of anthropology is often divided into different subfields, including:

- **Archaeology**, which uses the material evidence of archaeological sites and artifacts to reconstruct past societies and interpret their behaviors;
- **Biological anthropology**, which seeks to understand humankind from a biological perspective, including the study of human origins, primate relatives, and human biological diversity;
- **Cultural anthropology**, which describes and compares living human cultures in order to understand human cultural diversity;
- **Linguistic anthropology**, which studies different systems of human communication in order to understand how culture is shared and maintained; and
- **Medical anthropology**, which takes a holistic approach to understanding health, illness, disease, sickness, and healing.

The Department of Anthropology offers the following undergraduate degrees and minors. Click on each link to see a description of the major or minor program requirements.

Undergraduate students can earn a:

- Bachelor of Arts degree in Anthropology (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-bachelor-arts/>)
- Bachelor of Arts degree in **Anthropology (Culture & Language)**, which includes a concentration in culture and language studies
- Minor(s) in Anthropology (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-undergraduate-minor/>), Archaeology (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/archaeology-undergraduate-minor/>), **Medical Anthropology**, Religious Studies (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/religious-studies-undergraduate-minor/>), and Sustainability (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/sustainable-development-undergraduate-minor/>)

Please visit the Anthropology Catalog (<https://catalogs.nmsu.edu/nmsu/course-listings/anth/>) for descriptions of all courses offered by the department.

Anthropology Master's Accelerated Program (MAP)

The Anthropology MAP Program permits qualified **undergraduate students** to earn a maximum of 9 credits of graduate-level coursework and have these **credits count both for the BA in Anthropology and the**

Master's degree in Anthropology. The Anthropology MAP program is a dual credit program, not a dual degree program.

Students accepted to the Anthropology MAP Program may apply 9 credits of qualified elective courses towards the graduate MA degree in Anthropology or towards an interdisciplinary graduate minor or graduate certificate in Anthropology, Archaeology, Food Studies, the Graduate Certificate in Cultural Resource Management, or the Graduate Certificate in Museum Studies.

The NMSU Graduate School has established general rules and processes for all MAP programs at NMSU. They have been adapted to meet the particular requirements of the Department of Anthropology and the requirements of Anthropology's graduate programs. For details about the NMSU Graduate School MAPS program, please see Honors College: <https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html>.

For questions about the Anthropology MAP Program, please contact the Department of Anthropology Home Page ([nmsu.edu](https://anthropology.nmsu.edu/)) (<https://anthropology.nmsu.edu/>).

Graduate Program Information

The Anthropology Master of Arts Program at NMSU provides students with the knowledge, skills, and practical experience they need to transform their interests into a rewarding career. Our program strengths include applied research, especially in the areas of cultural resource management, museum studies, environmental anthropology, food security, and health and wellness. We value our M.A. students, and work to develop strong advising and mentoring relationships. Many of our graduates go on to successful careers in the public or private sector, while some choose to pursue a Ph.D. after completing their master's degree at NMSU.

In addition to the Anthropology Master of Arts degree, our program also offers two Graduate Certificates and several graduate minors. Click on each of the links below to see descriptions of the program requirements.

Graduate students can earn a:

- Master of Arts in Anthropology (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-master-arts/>)
 - An undergraduate anthropology degree is not required for admission; however, students who lack the equivalent of core undergraduate anthropology courses may be required to take them during their first year of the master's program.
- Graduate Certificates in Cultural Resource Management (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/cultural-resource-management-graduate-certificate/>) (CRM) and Museum Studies (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/museum-studies-graduate-certificate/>)
 - These graduate certificates are separate from the M.A. degree and require a separate application. Many of our M.A. students also earn graduate certificates.
- Graduate minors in Anthropology (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-graduate-minor/>), Archaeology (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/archaeology-graduate-minor/>), and Food Studies (<https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/food-studies-graduate-minor/>)
 - Graduate minors are available to students earning their master's or Ph.D. degrees in other programs at NMSU.

Please visit the Anthropology Catalog (<https://catalogs.nmsu.edu/nmsu/course-listings/anth/>) for descriptions of all of our anthropology courses.

If you have additional questions or would like to schedule a campus visit or virtual meeting, please contact the Department of Anthropology: Home Page ([nmsu.edu](https://anthropology.nmsu.edu/)) (<https://anthropology.nmsu.edu/>)

Degrees for the Department

Bachelor Degree(s)

- Anthropology (Culture & Language) - Bachelor of Arts (p. 453)
- Anthropology - Bachelor of Arts (p. 450)

Master Degree(s)

- Anthropology - Master of Arts (p. 97)

Anthropology Master's Accelerated Program (MAP)

The Anthropology MAP Program permits qualified **undergraduate students** to earn a maximum of 9 credits of graduate-level coursework and have these **credits count both for the BA in Anthropology and the Master's degree in Anthropology**. The Anthropology MAP program is a dual credit program, not a dual degree program.

Students accepted to the Anthropology MAP Program may apply 9 credits of qualified elective courses towards the graduate MA degree in Anthropology or towards an interdisciplinary graduate minor or graduate certificate in Native American Studies, Anthropology, Archaeology, the Graduate Certificate in Cultural Resource Management, or the Graduate Certificate in Museum Studies.

The NMSU Graduate School has established general rules and processes for all MAP programs at NMSU. They have been adapted to meet the particular requirements of the Department of Anthropology and the requirements of Anthropology's graduate programs. For details about the NMSU Graduate School MAPS program, please see Honors College: <https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html>.

For questions about the Anthropology MAP Program, please contact Dr. Rani T. Alexander (raalexan@nmsu.edu).

Eligibility:

Undergraduate students may petition to participate in the Master's Accelerated Program (MAP) in the Department of Anthropology if they meet the following requirements:

- Undergraduate students must be juniors or seniors and have completed 60 credit hours of coursework towards an undergraduate degree.
- Preferred 3.5 GPA.
- Completion of two or more of the undergraduate core courses, Anth 301, Anth 315, Anth 355, and Anth 350 is strongly preferred.
- Undergraduate students must have an assigned faculty advisor within the Department of Anthropology and obtain appropriate signatures before being approved for MAPS by the NMSU Graduate School.
- Students must be advised by financial aid advisor and obtain appropriate signatures before being approved for MAP by the NMSU Graduate School.
- MAP students must meet with their advisor at least once per semester before registration.

- Students accepted into the Anthropology MAP program, must participate in the Online Developing New Scholars Program (DNSP), offered by the Graduate School.
- Students may not have previously earned a Bachelor's Degree.
- Students have removed any Incomplete grades or holds at the time that they request admission to a graduate-level class.
- Students may not attempt more than 3 credits of graduate coursework in one semester.
- Students must earn a grade of B or higher to have graduate credits count under the MAP program. Graduate courses completed with a B- or lower are not eligible for MAP credit.
- Qualified graduate level courses included in the Anthropology MAP program are limited to a discrete list of electives numbered 500 and above. Eligible MAP courses are chosen only with approval of the student's MAP advisor and consent of instructor.
- For full program details and questions, please contact the Anthropology Department: Home Page ([nmsu.edu](https://anthropology.nmsu.edu/)) (<https://anthropology.nmsu.edu/>).

Minors for the Department

- Anthropology - Graduate Minor (p. 212)
- Anthropology - Undergraduate Minor (p. 456)
- Archaeology - Graduate Minor (p. 212)
- Archaeology - Undergraduate Minor (p. 456)
- Medical Anthropology - Undergraduate Minor (p. 456)
- Religious Studies - Undergraduate Minor (p. 457)
- Sustainability- Undergraduate Minor (p. 457)

Graduate Certificates

- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 125)
- Cultural Resource Management - Graduate Certificate (p. 205)
- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)
- Museum Studies - Graduate Certificate (p. 207)

Professor, Rani T. Alexander, Department Head

Professors Alexander, Arakawa, Scott; Stanford, Walker; **Associate Professors** Jenks; **Assistant Professors** Olszowy; **University Museum Curator** Hartell; **Emeritus Professors** Benefit, Chaiken, Conelly, Eber, McCrossin, O'Leary, Pepion, Rushforth, Staski, Trevathan.

R. T. Alexander, Department Head, Ph.D. (New Mexico)– Mesoamerican archaeology, historical archaeology of Yucatan, ethnohistory and colonialism, agrarian ecology, zooarchaeology; F. Arakawa, Ph.D. (Washington State)– prehistoric American Southwest, lithic technological organization, pottery in Mesa Verde region, sociopolitical organization in tribal-level societies; N. Hartell, MA (New Mexico State) - museum studies, exhibition, collections research, southern New Mexico and Latin America; K. Olszowy, Ph.D. (Binghamton) - economic development and chronic disease risk, sex/gender-based disparities in obesity risk, mental and physical health outcomes

associated with natural disasters, child growth and development, and the biology of poverty; M. A. T. Scott, Ph.D. (Kentucky)– medical Anthropology, public health, transnational migration, Latin America; L. Stanford, Ph.D. (Florida)– agriculture, organizations, food studies, globalization, sociocultural anthropology, Latin America; W. Walker, Ph.D. (Arizona)– Southwestern archaeology, theory and field method in archaeology, ritual prehistory.

Anthropology Courses

ANTH 1115G. Introduction to Anthropology

3 Credits (3)

Anthropology is the systematic study of the humanity both past and present. The course introduces students to the four subfields of anthropology, which include archaeology, biological, linguistic and cultural anthropology. Students will learn about the concepts and methods that anthropologists use to study our species and gain a broader perspective on the human experience.

Learning Outcomes

1. Describe and summarize terms, approaches, and cultural and biological adaptations in the four subfields of anthropology.
2. Explain and analyze conceptual and ethical arguments in the four subfields of anthropology.
3. Effectively communicate content, perspectives, and ideas in four subfields of anthropology.
4. Critically evaluate sources, approaches, and arguments in the four subfields of anthropology.

ANTH 1135G. Introduction to Biological Anthropology

3 Credits (3)

This course provides a basic introduction to the broad field of biological anthropology. The research interests of biological anthropologists include the history and development of modern evolutionary biology, molecular and population genetics, modern primates, the primate and human fossil record, and modern human biological diversity.

Corequisite(s): ANTH 1135L.

Learning Outcomes

1. Summarize the basic principles of evolution and recognize how they apply to the human species.
2. Recognize the biological and behavioral continuity of humans with all life, and especially other modern primate species.
3. Identify ways in which the human species is biologically and behaviorally unique.
4. Summarize fossil evidence for human evolution.
5. Distinguish the major Paleolithic industries and outline the behavioral and cognitive changes indicated by the fossil and archeological evidence.
6. Critically evaluate popular accounts of human variation and human evolution.
7. Interpret modern human dilemmas (e.g., overpopulation, co-evolution of disease, and genetic engineering) from an evolutionary perspective.
8. Discuss in class and analyze in writing scholarly arguments concerning course concepts.

ANTH 1135L. Introduction to Biological Anthropology Lab

1 Credit (2P)

This laboratory course expand on the topics covered in lecture course and uses scientific methods and principles to examine evidence for the process of evolution, the nature of heredity, human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity. Hands-on experience with fossil and skeletal material will be an important part of the learning process. Corequisite(s): ANTH 1135G

Learning Outcomes

1. Demonstrate an understanding of the scientific method.
2. Employ principles of Mendelian genetics to determine genotype and phenotype probabilities, and calculate gene, genotype, and phenotype frequencies using the Hardy-Weinberg Equilibrium formula.
3. Demonstrate an understanding of cell structure and functions.
4. Use common lab and anthropometric equipment such as a compound microscope and calipers.
5. Discuss primate evolution, and compare and contrast members of the Primate order in terms of structure, behavior, and phylogeny.
6. Classify hominid species based upon selected traits such as anatomical changes associated with bipedalism, changes in the size and structure of the brain, and the development of culture.
7. Locate and describe the major bones of the human skeleton, and identify characteristics of human skeletons or skulls such as gender, age, and ancestry.
8. Discuss current research in genome analysis of various hominid populations.

ANTH 1136. Introduction to Historic Preservation

3 Credits (3)

Introduction to historic preservation, its history, goals, methods, legal basis, and economic importance. Explores public role in decision-making. Community Colleges only.

Learning Outcomes

1. Understand why historic preservation is important;
2. be familiar with what is important to preserve;
3. know who among the general public, state, and federal governments is responsible for preserving the past;
4. Have gained experience in how we all preserve.

ANTH 1137G. Human Ancestors

3 Credits (3)

Evolutionary history of the human species from its origin in the primate order, with primary emphasis on the evolution of humankind during the past three million years. Examination of the social lives of apes and consideration of similarities to and differences from them. Biological foundations of human behavior, emphasizing thought, movement, and interaction.

Learning Outcomes

1. Describe the evolution of the human species, from its origin in the primate order to the emergence of *Homo sapiens*, and to the present-day.
2. Describe the social lives of apes and identify similarities to and differences between apes and humans.
3. Explain the biological foundations of human behavior.

ANTH 1140G. Introduction to Cultural Anthropology**3 Credits (3)**

This is an introductory course that provides an overview of cultural anthropology as a subfield within the broader discipline of anthropology and as a research approach within the social sciences more generally. The course presents core concepts and methods of cultural anthropology that are used to understand the ways in which human beings organize and experience their lives through distinctive cultural practices. More specifically, this course explores social and cultural differences and similarities around the world through a variety of topics such as: language and communication, economics, ways of making a living, marriage and family, kinship and descent, race, ethnicity, political organization, supernatural beliefs, sex and gender, and globalization. This course ultimately aims to present a broad range of perspectives and practices of various cultural groups from across the globe. May be repeated up to 3 credits.

Learning Outcomes

1. Introduce students to the basic concepts and research methods of cultural anthropology as one of the disciplines of social science, including fundamental concepts, such as culture and society, which form the pillars of the discipline (e.g., cultural relativism, cultural persistence and change, world-view and enculturation).
2. Comprehend the importance of studying cultural anthropology.
3. Demonstrate knowledge of the practice of anthropological research in the modern world that is increasingly multicultural, transnational and globally interconnected (e.g., globalization and modern world system).
4. Demonstrate an awareness of how students' own cultures shape their experiences and the way they see the world, as well as help them understand and interact with other cultures.
5. Understand how beliefs, values and assumptions are influenced by culture, biology, history, economic, and social structures.
6. Gain a sense of relationship with people possessing different experiences from their own.
7. Gain a deeper understanding and appreciation for cultural anthropology as a broad discipline through learning about its practices, and differentiating cultural anthropology from other disciplines that study people
8. Become more sensitive and engaged global citizens from culturally relative perspectives.

ANTH 1160G. World Archaeology**3 Credits (3)**

This course is an exploration of human evolution and cultural development throughout the world. Students will be introduced to basic anthropological methods and theories and will learn how anthropological research has contributed to our understanding of major themes in human prehistory, including human evolution, the origins of culture, migration and colonization, animal and plant domestication, and the rise and fall of civilizations.

Learning Outcomes

1. Describe and explain the major developments in human prehistory.
2. Identify and describe major archaeological cultures throughout the world.
3. Employ critical thinking skills in the evaluation of competing theories about the past.
4. Select and use relevant archaeological evidence to explain how prehistoric populations adapted to their natural and cultural environments.
5. Demonstrate competency in written communication.

ANTH 2140G. Indigenous Peoples of North America**3 Credits (3)**

This course is a general survey of the history and ethnology of indigenous groups in North America. The course is designed to give students a comprehensive view of major issues pertaining to the indigenous cultures of North America, such as family structure, social organization, subsistence and contemporary economies, environmental adaptation, Indian-White relations, religious practices, and contemporary issues.

Learning Outcomes

1. Demonstrate familiarity with common elements pertaining to the languages and social organization of indigenous peoples in North America.
2. Recognize fundamental differences and similarities among traditional indigenous cultures.
3. Describe social relations of indigenous peoples in relationship to other ethnic groups.
4. Identify and analyze important ways that European societies and cultures and indigenous societies and cultures interacted from the time of Columbus to the present.
5. Evaluate the impacts of Euroamerican policies and programs on indigenous cultures.
6. Distinguish major social issues facing contemporary indigenous communities in North America.
7. Understand objectives and limitations of cross-cultural analysis in anthropology as they relate to the study of indigenous peoples in North America.
8. Demonstrate research and communication skills as they relate to the study of indigenous peoples in North America.

ANTH 2996. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

ANTH 301. Cultural Anthropology**3 Credits (3)**

The course will introduce students to the basic concepts and methods in cultural anthropology, focusing on the critical role of culture in traditional society and in the modern world. We apply the anthropological perspective to study the components of cultural systems, including language and meaning, ways of making a living, kinship, worldview, power and political systems, and socio-cultural inequalities, among others, across different cultures. By “unpacking” culture, we focus on how local knowledge is put to work in grappling with practical problems of everyday life. May be repeated up to 3 credits.

Learning Outcomes

1. Students will explain the core concepts in cultural anthropology, including the complexities, contradictions, dynamics, and implications.
2. Students will identify the important methods of fieldwork, linking theory to application.
3. Students will explain the critical components of cultural systems and how they operate, comparing and contrasting their different manifestations across different cultures. This identification should also address the complexities, dynamics, and implications.
4. Students will develop anthropological field skills in carrying out field projects, analyzing observed practices, symbols, and activities.
5. Students will identify and explain factors that explain cultural persistence and the relevance of culture in the modern world.

ANTH 305V. Contemporary Native Americans**3 Credits (3)**

Introduction to contemporary native peoples and cultures of North America. Emphasis on sociocultural and socioeconomic history, sociocultural change and persistence, present day reservation life, and current social and economic goals.

Learning Outcomes

1. Identify the major challenges within American Indian communities.
2. Analyze the components and causes of contemporary issues in Indian country.
3. Understand and be able to define sovereignty and self-determination and the relationship of Native nations to the U.S. government.
4. Develop an awareness of the historical and continuing efforts of resistance, adaptation, and endurance of Native peoples.
5. Integrate learned concepts to address contemporary Native American issues.
6. Possess foundation knowledge as preparation for higher-level coursework in NATV.

ANTH 306V. Peoples of Latin America**3 Credits (3)**

The course presents an overview of different cultures in Latin America, covering a range of topics including history, environment, race and ethnicity, religion, health, music, food, popular culture, globalization, and violence. Within this context, the perspective of cultural anthropology looks at the commonality of patterns shared across Latin America, at the same time that we examine the construction of cultural diversity, a diversity that has persisted into the modern era. We also examine how different Latin American peoples use culture, i.e., through their food, music, religion, and politics among other elements, as a way of shaping and conserving their ethnic identity. The class includes a mixture of lecture, discussion, films, music, and good food...

Learning Outcomes

1. Students will explain the major prehistoric Latin American civilizations and their role in shaping distinctive modern cultures today.
2. Students will identify the major ecological zones in Latin America and corresponding cultural adaptations and subsistence strategies.
3. Students will explain the critical role of economic and political history throughout the Colonial Period and Independence in shaping the patterns of cultural diversity, racial boundaries, and ethnic identities.
4. Students will explain the role of cultural practices (such as religion, music, popular culture, and foodways) in supporting indigenous and minority populations' efforts to retain distinct cultural identities.
5. Students will explain the global and historical connections between Latin American and the United States, in particular the role that Latin American culture, migration, and traditions have played in shaping our society's development.

ANTH 307V. Japanese Culture and Society: Anthropological Perspectives**3 Credits (3)**

This course introduces students to Japanese culture from anthropological and philosophical perspective. Learning about Japanese culture (non-Western) enhances students' awareness of the diversity of human values, beliefs, and morals and provides an understanding of cultural differences outside of mainstream American culture.

Learning Outcomes

1. Take a position on an anthropological theory that accounts for how and why Japanese culture has changed through time.
2. Select and integrate relevant anthropological perspectives to argue for or against ethical and moral differences between American and Japanese cultures.
3. Analyze social, political, and religious aspects in Japanese society and compare them with those in America.
4. Investigate sociopolitical and economic status of minority groups in Japan using anthropological approaches and compare them with those of America.
5. Engage in face-to-face interactions with Japanese people in southern New Mexico and discuss similarities and differences between cultures, values, and worldview.

ANTH 312. The Ancient Maya**3 Credits (3)**

Archaeological evidence of culture change in the Maya civilizations of Mexico and Central America from 2000 BC to the Spanish Conquest.

ANTH 313V. Ancient Mexico**3 Credits (3)**

We will explore the archaeology the Aztecs, Zapotecs, and the Maya of Mexico and Central America from 3000BC up to and including the Spanish invasion of 1519-1521. We will examine how the legacies of these great civilizations were erased from written sources and how Mesoamerican heritage can be preserved and reclaimed for descendant communities and the public using archaeological remains. We will address: (1). the origins of agriculture and traditional food systems in Mesoamerica; (2). the rise of cities and urban centers; (3). writing, religion, social inequality, and the circulation of commodities; (4). Political disintegration, fragmentation, and collapse; (5). the formation and expansion of the Aztec and Tarascan empires; and (6). the consequences of the Spanish invasion and colonialism.

Learning Outcomes

1. Take a position on theories that explain how, when, and why human lifeways changed in ancient Mesoamerica.
2. Select and integrate relevant archaeological evidence to argue for and against a theoretical position.
3. Analyze the significance of sites, structures, artifacts, and ecofacts within their archaeological contexts and explain their relevance for people today.
4. Evaluate how practices in research, conservation, and tourism to archaeological sites promote stewardship of non-renewable archaeological resources and intangible heritage.
5. Critique and reflect on designs for virtual public tours of archaeological sites in Mexico or Central America and suggest improvements to best practices for the preservation and public presentation of archaeological resources.

ANTH 315. Introduction to Archaeology**3 Credits (3)**

This course introduces you to the discipline of archaeology, situating this discipline within the wider field of anthropology. The first part of the course presents a brief history of the discipline, introduces some foundational concepts, and explains common field research methods. The second part of the class takes you through the process of identifying, classifying, and interpreting archaeological materials. The third and final part of the class introduces you to different research areas and types of professional work within archaeology. May be repeated up to 3 credits.

Learning Outcomes

1. Identify major figures, sites, and trends in the history of archaeology
2. Identify and describe common field and laboratory methods used in archaeology
3. Construct and critically evaluate material culture typologies
4. Explain and provide examples of different models of archaeological inference
5. Describe and apply different theoretical approaches to the study of the human past
6. Identify and describe significant areas of archaeological research and work

ANTH 318. Historical Archaeology**3 Credits (3)**

This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 518.

Learning Outcomes

1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 320. Anthropological Linguistics**3 Credits (3)**

The study of language and culture with particular emphasis on the cultural factors in the communication process.

ANTH 330V. Magic Witchcraft and Religion**3 Credits (3)**

Provides an introduction to method and theory for the study of religion, ritual, and spiritual practice. Review and discussion of case studies drawn from around the globe to enhance understanding of the varied ways that people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends.

Learning Outcomes

1. Define and identify examples of magic, science, witchcraft, and religion. Develop an understanding of the variation in cultural and behavioral practices associated with each.
2. Develop knowledge and critique early approaches and concepts in the anthropology of religion and its role in explanations of cultural change.
3. Develop knowledge of variation in religion as a cultural system and the experiences of liminality in rites of passage.
4. Identify the statuses and roles of various kinds of religious practitioners and their positionalities vis a vis dominant and resistant ideologies and structural inequality.
5. Develop critical thinking skills that speak to the relevance of different forms of religious thought and ritual practice in our daily lives.

ANTH 345. Introduction to Museology**3 Credits (3)**

This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.

Learning Outcomes

1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 347. Museum Confidential**3 Credits (3)**

This course will introduce students to many of the fundamental concepts behind the creation of a museum exhibition. Drawing from the extensive permanent collection of the University Museum, housed in the basement of Kent Hall, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition in the west gallery of the Museum. By turning the museum inside-out, this course will be a unique behind-the-scenes experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the cabinet of curiosity and wunderkammer, to readymades and Mark Dion's re-imagined museums. Crosslisted with: ANTH 547.

Learning Outcomes

1. Explain the basic concepts and terminology of the museum
2. Differentiate the functions, roles, duties and responsibilities of museums
3. Describe the types of museums and their historical development
4. Discuss the challenges and responsibilities that museums and their staff members encounter, most especially in collections
5. Employ the fundamental principles and practices of museum documentation (knowledge of deaccessioning and the challenges faced by museum and inherited collections)
6. Apply the fundamental principles and practices of collection management
7. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator

ANTH 349. Museum Anthropology**3 Credits (3)**

This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.

Learning Outcomes

1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 350. Anthropological Theory**3 Credits (3)**

This course introduces students to historical and contemporary theory in anthropology with a focus on understanding why theory matters in our discipline. Key questions the course explores include: How have anthropologists thought about the concept of culture in different ways throughout the history of anthropology? What is the relevance of anthropological theory, both inside and outside the discipline? What new and promising trajectories do we see in anthropological theory today? May be repeated up to 3 credits.

Learning Outcomes

1. Trace the history of anthropological theory. You will recognize major figures and schools of thought in anthropological theory and be able to articulate their contributions to the field.
2. Critically analyze anthropological concepts of culture. Throughout the course, you will hone analysis skills through discussing and critiquing various anthropological perspectives on the culture concept.
3. Apply anthropological theory to contemporary anthropological "problems". Throughout the course, you will reflect on the usefulness of anthropological theory to the field and beyond. You will be able to articulate the connections made through writing and class discussion.

ANTH 355. Biological Anthropology**3 Credits (3)**

An introduction to the fundamentals of the scientific method and organic evolution specific to the study of human origins and contemporary biological variation. Non-human primate diversity and behavior are also considered.

Learning Outcomes

1. Increase scientific literacy.
2. Improve specific skill areas including: Critical thinking; Expository writing; Analytical reading; Oral presentation skills.
3. Establish foundational knowledge as a basis for further study in: Evolutionary theory; Human variation and adaptation; Primatology; Human origins and evolution.

ANTH 356. Forensic Anthropology**3 Credits (3)**

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Learn about the scientific method and how to apply scientific findings to field work.
2. Learn about the history and applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Learn to identify human bones and the process of building a biological profile of human remains.
5. Learn about decomposition and how forensic anthropologists process and interpret crime scenes.

ANTH 357V. Medical Anthropology**3 Credits (3)**

This course introduces students to evolutionary, ecological, interpretive, political-economic, and applied anthropological perspectives on health, illness, and healing to address some of the major questions in the field. How do humans adapt to changing environments that bring with them new illnesses and diseases? How do anthropologists understand the multiple meanings of health and illness cross-culturally? How can anthropologists effectively study health inequalities? What can medical anthropological perspectives contribute to addressing the health issues that we face in our current global context?

Learning Outcomes

1. Explain medical anthropology to someone unfamiliar with the field. Meeting this goal requires that you are able to: Define medical anthropology; Define health, illness, sickness, disease, and healing; Explain basic research methods in medical anthropology; Identify the different perspectives within medical anthropology.
2. Evaluate health problems from medical anthropological perspectives. Meeting this goal requires that you are able to: Accomplish goal
3. Identify different medical anthropological perspectives in research and reporting on health problems; Identify what is missing (based on your knowledge of medical anthropological perspectives) in addition to what is present in research and reporting on health problems.
4. Apply medical anthropological perspectives to current health problems. Meeting this goal requires that you are able to: Accomplish goals 1 and 2; Develop deeper understanding of medical anthropological perspectives by formulating "in your own words" definitions of medical anthropological perspectives; Identify multiple facets of major health issues.

ANTH 360V. Food and Culture Around the World**3 Credits (3)**

Study of the interaction between food and human culture from an anthropological perspective. Examines the traditional role of food in local economies, social relations, and identity around the world. Also examines the impact of globalization on traditional food systems and cultures.

ANTH 362V. Environmental Anthropology**3 Credits (3)**

This course examines environmental studies from an anthropological perspective. The class focuses on how cultural values mediate environmental management. The class covers topics such as environmental anthropology, large scale development, biodiversity conservation, sustainable development, indigenous groups, consumption, and globalization.

Learning Outcomes

1. Students will understand the impact of cultural values on how humans interact with the environment.
2. Students will understand how different cultural perspectives can be used to address environmental problems.
3. Students will critically reflect on their own environmental values and recognize how these values are shaped by our own culture.

ANTH 375. Pottery Analysis in Archaeology**3 Credits (3)**

This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 575.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 376. Lithic Technology Organization**3 Credits (3)**

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data.

Prerequisite(s): ANTH 315.

ANTH 378. Introduction to Lab Methods in Archaeology**3 Credits (3)**

Introduction to laboratory techniques used in the analysis of archaeological materials.

Learning Outcomes

1. Identify different categories and types of archaeological materials.
2. Employ common methods for analyzing material culture.
3. Explain how research design determines analytical methods and shapes interpretations.
4. Discuss our ethical obligation to preserve collections for future researchers, while recognizing the challenges involved in this endeavor.

ANTH 385. Internship in Anthropology**3-12 Credits (3-12)**

Applied or field experience to gain professional expertise. Placements with public agencies, NGOs, or research organizations. Topical focus tailored to student's individual needs through consultation with instructor.

Prerequisite(s): Junior status, consent of instructor and GPA 2.8 or better.

ANTH 388. Intermediate Archaeological Field School**2-6 Credits (2-6P)**

Training in archaeological field methods, including excavation of archaeological sites, mapping, and data management and analysis.

Consent of Instructor required.

Learning Outcomes

1. Map sites/site features using a compass and tape, GPS unit, and total station/RTK GNSS receiver.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 389. Archaeological Mapping**3 Credits (3)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.

Learning Outcomes

1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 399. Professionalism & Practice in Anthropology **3 Credits (3)**

This course serves as a capstone for Anthropology majors. It offers students a writing focused opportunity to hone professional anthropological skills including critical thinking and communication strategies. All communication takes a position; it makes an argument. Students will learn and practice these skills through writing, rewriting and then rewriting again a research paper, a curriculum vitae/resume, employment letters of inquiry, and graduate school letters of inquiry. Restricted to Anthropology Majors. May be repeated up to 3 credits.

Learning Outcomes

1. Learn and practice written communication these skills through writing, rewriting and then rewriting again a research paper,
2. Learn and practice professional verbal and visual communications through research presentations, job interviews and elevator speeches
3. Identify and use anthropologically informed ethical responsibilities that pervade written, verbal and visual communication skills (e.g., goals for use of information, use of accurate information, protection of sources of information, honest attribution of credit to sources of scholarly work, sensitivity to others cultural traditions);

ANTH 402. Contemporary Medical Anthropology **3 Credits (3)**

Contemporary Medical Anthropology This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 546.

Prerequisite(s): ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.

Learning Outcomes

1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 414. The Archaeology of Religion **3 Credits (3)**

The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 415. Applied Anthropology **3 Credits (3)**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 515.

ANTH 419. Topics in Prehistoric Archaeology **3 Credits (3)**

Specific subjects in prehistoric archaeology as announced in the Schedule of Classes. May be repeated up to 6 credits.

ANTH 431V. Nutritional Anthropology **3 Credits (3)**

This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.

Learning Outcomes

1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 433V. Sex, Gender and Culture **3 Credits (3)**

This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc., expand our understanding of the various ways gender is defined across space and time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

ANTH 435. Human Health and Biological Variation**3 Credits (3)**

Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 535.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 436. Evolutionary Medicine**3 Credits (3)**

This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.

Learning Outcomes

1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 449. Directed Reading**1-6 Credits**

Comprehensive reading on selected topics. May be repeated for a maximum of 6 credits.

Prerequisite(s): Upper division anthropology majors with consent of instructor.

ANTH 449 H. Directed Reading Honors**1-3 Credits**

Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.

ANTH 456. Native American Intersections in Museums**3 Credits (3)**

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 556.

ANTH 458. Fertility, Reproduction and Birth**3 Credits (3)**

This course examines biocultural variation in reproductive health and birth practices, with topics such as gendered roles and responsibilities, pregnancy and birth as rites of passage, cultural concepts of personhood, global family planning initiatives, the medicalization of pregnancy and birth, developing reproductive technologies, and reproductive health disparities.

Prerequisite: ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.

Learning Outcomes

1. Identify multiple anthropological perspectives on sex, reproduction, and birth. Anthropologists approach questions about human sex, reproduction, and birth in a variety of ways. You will be able to identify and discuss some major perspectives in this area.
2. Critically analyze anthropological concepts of sex, reproduction, and birth. This course focuses on discussion of anthropological ideas about sex, reproduction, and birth. Not all fully agree with one another nor do they all fully answer the questions you may have. You should approach the materials we read and discuss from a critical angle.
3. Apply anthropological concepts about sex, reproduction, and birth to contemporary anthropological "problems" Throughout the course, you will reflect on the usefulness of different perspectives on sex, reproduction and birth to address current issues that we face in our globalized world.

ANTH 463. Cultural Resource Management I**3 Credits (3)**

This course introduces you to the field of cultural resource management (CRM) and to the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Class lectures, readings, and written assignments will cover the major relevant US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on understanding how to evaluate and nominate cultural resources for listing on the National Register of Historic Places (NRHP). Good oral and written communication skills are essential for success in CRM, so students will be provided with numerous opportunities to develop these skills in class.

Learning Outcomes

1. Explain the goals of cultural resource management (CRM)
2. Describe the major laws and regulations that govern CRM in the United States, in the state of New Mexico, and abroad
3. Identify some common challenges with implementing these laws and regulations
4. Determine the eligibility of cultural resources for listing on the NRHP, and justify this determination

ANTH 464. Curation Crisis in Archaeology**3 Credits (3)**

This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#“crisis”#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.

Learning Outcomes

1. Learn about the maintenance of archaeological collections
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about various ways of disseminating archaeological collections to the public
6. Change the perception of the “just digging and we will deal with the collections later” approach.

ANTH 467. Archaeology of the American Southwest**3 Credits (3)**

Description and analysis of the archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures.

Prerequisite: ANTH 315.

Learning Outcomes

1. Learn the culture history of the American Southwest from the Ice-Age through the Spanish Colonial Period.
2. Students will learn the advances in archaeological method and theory developed in the American Southwest such as Tree-ring dating, Pottery Seriation, Paleoindian Archaeology.
3. Students will develop a research interest in the region through a paper specializing in a theme and subregion e.g. Architectural change in the four corners during the 13th century, the adoption of corn in the Late archaic borderlands of southern New Mexico.

ANTH 468. Applied Medical Anthropology**3 Credits (3)**

This course introduces students to applications of medical anthropological perspectives to health care, international development, public health, and health policy.

Learning Outcomes

1. Discuss the usefulness of anthropological perspectives in addressing health issues in a variety of interdisciplinary and professional settings.
2. Assess the health impact of public policy from anthropological perspective.

ANTH 472. Primate Behavior and Ecology**3 Credits (3)**

Survey of the social behavior and ecology of nonhuman primates. Crosslisted with: BIOL 472.

ANTH 474. Human Osteology**3 Credits (3)**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 424.

ANTH 474 L. Human Osteology Lab**1 Credit (1P)**

Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Students are recommend to take ANTH 355 or an equivalent before enrolling in this course. Crosslisted with: BIOL 424 L.

Corequisite(s): ANTH 474.

ANTH 477. Zooarchaeology**3 Credits (3)**

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. May be repeated up to 3 credits.

ANTH 485. Special Research Project**1-3 Credits**

Anthropological, archaeological, or museum field work or laboratory experience in academic, private, state, or federal agencies. Must spend 30 hours in a field, museum, or laboratory setting per credit hour earned. May be repeated up to 6 credits.

Prerequisite(s): Complete 12 ANTH credits and consent of instructor.

ANTH 486. Community Engagement and Service Learning**3 Credits (3)**

Course combines classroom instruction with a local community service project. Formal instruction component will examine social science research findings and perspectives on a locally relevant social issue or problem. In the service learning component, students will be trained and work on a local community service project. Students will develop field experience and methodological skills in community engagement. Projects and social issues may vary for different semesters.

ANTH 488. Archaeological Field School Advanced**2-6 Credits (2-6P)**

Additional training in archaeological field methods for students with previous fieldwork experience. Consent of Instructor required.

Learning Outcomes

1. Map sites/site features using a compass and tape, GPS unit, and total station/RTK GNSS receiver.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 497. Special Topics**1-6 Credits (1-6)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite(s): Junior or above standing.

ANTH 500. Seminar in Anthropological Theory**3 Credits (3)**

Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 502. Fundamentals of Anthropology**1-4 Credits (1-4)**

Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. Graded S/U.

ANTH 503. Anthropological Theory**3 Credits (3)**

This seminar is designed to introduce graduate students to the major concepts and developments in anthropological theory. Students will develop an understanding of the major principles, contributions, and limitations of anthropological theory from the 1890s to the present. The course will address theoretical developments in biological anthropology, sociocultural anthropology, archaeology, and public and applied anthropology.

Learning Outcomes

1. Articulate the history of theoretical developments in multiple anthropological subfields and explain the holistic connections among them.
2. Explain and critique the major theoretical formulations of the field, including: human biological evolution and variation; cultural relativism; practice theory; life history and formation processes of archaeological, paleontological, and contemporary sites and specimens; historical contingency in culture change and globalization; human ecology and environmental anthropology, past and present; indigenous perspectives, participatory action research, and collaborative research designs; identity and the intersections of gender, sex, race, class, and other categories, past and present; origins and contemporary variation of inequality and socioeconomic disparities; political economy, domination and resistance, past and present; the development and critique of diverse narratives of the past drawn from archaeological/material, visual and performative, documentary, and oral historical media; stewardship of tangible and intangible cultural heritage,
3. Read and practice in the norms of written and verbal expression across multiple theoretical domains in anthropology.

ANTH 505. Issues in Anthropological Practice**3 Credits (3)**

This is a course in professional development in which students design their thesis/non-thesis research projects and write a first draft of their capstone research proposal. The purpose is to connect the MA thesis or non-thesis research project to your future career. Professionals in anthropology should demonstrate competency in research and writing by completing an M.A. thesis or qualification equivalent (e.g. internship report, research report, which increasingly include public scholarship and the development of creative digital media). Successful completion of an original research project demonstrates that a student can conduct applied and collaborative research, complete a scope of work according to standards and guidelines of the agency, institution, or organization, and evaluate the research and contributions of colleagues and peers. Anthropologists are all called to participate in the investigation, management, and evaluation of cultural resources (tangible and intangible), address the intersectionalities within organizations and institutions that differentially impact social groups, and work with individuals and communities to achieve shared objectives that enhance engagement.

Learning Outcomes

1. Students will develop and implement a research project in anthropology. We will focus on research design—from defining the research problem, funding, lit review, logistics of fieldwork, analysis, and write-up. Students will move from exploring a topic of interest to developing a proposal for investigation.
2. Students will develop professional skills, ethics, values, and attitudes necessary for developing and implementing a research project and for employment in the field. They will map out a pathway to a career in anthropology. We will examine anthropological practice in academic and applied contexts. We will consider expectations and qualifications needed for different work environments and degree programs. Students will work towards matching NMSU's MA curriculum to their professional goals. You should make the curriculum and university resources work for you.

ANTH 506. Advanced Studies in Physical Anthropology**1-3 Credits**

Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 507. Advanced Studies in Archaeology**1-3 Credits**

Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 508. Advanced Studies in Cultural Anthropology**1-3 Credits**

Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 512. Quantitative Analytical Methods in Anthropology 3 Credits (3)

This class is an introduction to statistical analysis of anthropological and social science data. Students will learn how quantitative and statistical techniques are used in the analysis of anthropological problems and how to evaluate statistical arguments in the literature. No previous background in statistics is required. We will consider data collection, sampling and statistical populations, exploratory summaries of data, and the importance of choosing appropriate statistical techniques. All course work will emphasize anthropological interpretation through applied statistical methods. The course has a four-field focus (archaeology, biological anthropology, cultural anthropology, and linguistics), and students will work with readings, examples, and problem assignments from each subfield.

Learning Outcomes

1. Articulate the difference between descriptive and inferential statistics.
2. Explain the difference between a population and a sample and learn how to draw random samples (various methods – simple random, stratified, systematic, etc.) in the field and using numerical data and statistical procedures within SAS or other STATPACKS (SPSS, R).
3. Use appropriate graphs, tables, and measures of central tendency and dispersion to display and summarize distributions of nominal, ordinal, interval and ratio level data.
4. Understand the Normal Distribution and the assumptions required for hypothesis testing.
5. Perform hypothesis testing and interpret the results for univariate, bivariate, and multivariate statistical procedures, including Chi Square, T-tests, Non-parametric Comparison tests, ANOVA, Correlation, Simple Linear Regression, Multiple Regression, Cluster and Discriminant Analysis (as time permits).
6. Develop an exploratory statistical analysis for original anthropological data and write a final paper interpreting the results.

ANTH 514. Advanced Issues in the Archaeology of Religion 3 Credits (3)

The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology and be required to lead class discussions.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 515. Applied Anthropology 3 Credits (3)

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.

ANTH 516. Advanced Archaeology of the American Southwest 3 Credits (3)

Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.

Learning Outcomes

1. Students will have an advanced understanding of the changes in subsistence, social organization, and material culture in the American Southwest from the Ice Age through the Spanish Entrada.
2. Students will understand the history of archaeological method and theory as it played out in the archaeology of the American Southwest. They will recognize that theory determines the questions asked about the ancient peoples of the region.
3. Graduate students will write a term paper (professional technical and scientific writing) that contributes to their MA projects either directly as part of a specific thesis or as extension of their interest in a topic (e.g., identity, domestication, ritual violence) or method (e.g., pottery sourcing, faunal analysis).

ANTH 517. Advanced Topics in Mesoamerican Archaeology 3 Credits (3)

Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

Prerequisite: graduate standing.

ANTH 518. Advanced Historical Archaeology 3 Credits (3)

This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 318.

Learning Outcomes

1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 519. Advanced Topics in Prehistoric Archaeology 3 Credits (3)

Seminar on specialized research archaeology.

Prerequisite: graduate standing.

ANTH 520. Ethnographic Field Methods 3 Credits (3)

Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.

ANTH 522. Archaeological Field School-Graduates**2-6 Credits (2-6P)**

Graduate-level training in archaeological field methods, including excavation, survey, mapping, documentation, and processing/analysis of data. Consent of Instructor required.

Learning Outcomes

1. Map sites/site features using a compass and tape, GPS unit, and total station/RTK GNSS receiver.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Process archaeological materials safely so that they can be analyzed in a laboratory environment.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 523. Archaeological Mapping**3 Credits (3)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.

Learning Outcomes

1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 529. Advanced Evolutionary Medicine**3 Credits (3)**

This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.

Learning Outcomes

1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 531. Issues in Nutritional Anthropology**3 Credits (3)**

This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.

Learning Outcomes

1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 533. Advanced Issues in Sex, Gender, and Culture**3 Credits (3)**

Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

ANTH 535. Adv. Human Health and Biological Variation**3 Credits (3)**

Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 435.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 538. Plants, Culture, and Sustainable Development**3 Credits (3)**

Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnoecology, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.

ANTH 539. Culture and Foodways**3 Credits (3)**

Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.

ANTH 540. Cultural Resource Management**3 Credits (3)**

Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.

ANTH 541. Advanced Indigenizing Methodologies in Native American Studies**3 Credits (3)**

This course utilizes indigenizing methodologies and praxis to gain insight into the complex effects of oppression and colonization. Critical and indigenous concepts are used to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Research theory and methodology such as community participatory action research that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people is emphasized.

Learning Outcomes

1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

ANTH 542. Cultural Resource Management II**3 Credits (3)**

Continuation of ANTH 540. This course introduces students to the business and practice of doing contractual cultural resource management in the United States.

Learning Outcomes

1. Map an archaeological site (meeting New Mexico state standards for archaeological survey)
2. Document an archaeological site (using a Laboratory of Anthropology site form)
3. Prepare a written site description suitable for inclusion in a survey report
4. Analyze and present data using relevant software (e.g., Excel, Access)
5. Prepare a research proposal or report (meeting New Mexico state standards)

ANTH 543. Indigenous Ways of Knowing**3 Credits (3)**

This course examines Indigenous knowledge and ways of knowing as a means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather than comparative analysis.

Learning Outcomes**ANTH 545. Advanced Museology****3 Credits (3)**

This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.

Learning Outcomes

1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 546. Advanced Contemporary Medical Anthropology**3 Credits (3)**

This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 402.

Learning Outcomes

1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 547. Museum Field Methods**3 Credits (3)**

This course will introduce students to many of the fundamental concepts behind the creation of a museum exhibition. Drawing from the extensive permanent collection of the University Museum, housed in the basement of Kent Hall, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition in the west gallery of the Museum. By turning the museum inside-out, this course will be a unique behind-the-scenes experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the cabinet of curiosity and wunderkammer, to readymades and Mark Dion's re-imagined museums. Crosslisted with: ANTH 347.

Learning Outcomes

1. Explain the basic concepts and terminology of the museum
2. Differentiate the functions, roles, duties and responsibilities of museums
3. Describe the types of museums and their historical development
4. Discuss the challenges and responsibilities that museums and their staff members encounter, most especially in collections
5. Employ the fundamental principles and practices of museum documentation (knowledge of deaccessioning and the challenges faced by museum and inherited collections)
6. Apply the fundamental principles and practices of collection management
7. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator
8. Object handling and basics of preventive conservation

ANTH 549. Advanced Museum Anthropology**3 Credits (3)**

This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.

Learning Outcomes

1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 556. Advanced Native American Intersections in Museums
3 Credits (3)

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 456.

ANTH 560. Advanced Forensic Anthropology
3 Credits (3)

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Understand how scientific findings from fields like biological anthropology are applied in forensic anthropology.
2. Understand the history and range of applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Gain a practical understanding of how forensic anthropologists identify human bones and the process of building a biological profile of human remains.
5. Understand processes like decomposition and recovery of remains at crime scenes.

ANTH 564. Advanced Curation Crisis in Archaeology
3 Credits (3)

This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#“crisis”#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.

Learning Outcomes

1. Learn about the maintenance of archaeological and repository collections over time
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about the development of a small as well as large archaeological database
6. Learn about various ways of disseminating archaeological collections to the public
7. Change the perception of the “just digging and we will deal with the collections later” approach.

ANTH 574. Advanced Human Osteology
3 Credits (3)

Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 574.

ANTH 575. Advanced Pottery Analysis in Archaeology
3 Credits (3)

This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 375.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 576. Lithic Technology Organization
3 Credits (3)

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data. Consent of Instructor required.

ANTH 577. Advanced Zooarchaeology
3 Credits (3)

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.

ANTH 578. Advanced Lab Methods in Archaeology
3 Credits (3)

Examination of advanced laboratory techniques used in the analysis of archaeological materials.

ANTH 579. Qualitative Data Analysis and Interpretation
3 Credits (3)

This course focuses on methods for qualitative data analysis, both computer-assisted and non-computer-assisted, and interpretation. It includes writing up data for academic articles or theses.

ANTH 585. Method and Theory in Archaeology
3 Credits (3)

Focus on major methodological and theoretical aspects of contemporary archeology.

ANTH 587. Field Work in Latin America

3-12 Credits

Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. No S/U grading.

Prerequisite: consent of instructor.

ANTH 596. Readings

1-6 Credits

Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.

ANTH 597. Internship

1-9 Credits

Anthropological or archaeological internship in private, state, or federal agency. May be repeated for a maximum of 18 credits. Consent of instructor required. Restricted to ANTH majors.

Prerequisite(s): graduate standing.

ANTH 598. Special Research Problems

1-6 Credits (6)

Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required. Restricted to ANTH majors.

Prerequisite(s): graduate standing.

ANTH 599. Master's Thesis

1-15 Credits

Thesis. Consent of instructor required. Restricted to ANTH majors.

Prerequisite(s): graduate standing.

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Anthropology - Bachelor of Arts

The field of anthropology provides a broadly based education in the social and biological sciences. Undergraduate anthropology majors develop an understanding of human diversity that will benefit them in a wide variety of careers. They have particular advantage in positions that require contact with different cultures and ethnic groups or with large organizations that provide human services.

Students intending to become professional anthropologists pursue careers in teaching, archaeological research, museums, public and private cultural resource management, international development and business, human services and health care, forensic sciences, urban planning, agricultural development, and administration. While anthropology is a traditional academic discipline, it also has become an applied profession.

Today, many anthropologists hold important positions in government, business, public policy organizations, and health professions. Anthropology's broad perspective on human diversity and intercultural relations provides students with valuable professional skills. NMSU anthropologists are committed to teaching practical knowledge and useful skills that will contribute to students' career goals and to their intellectual development.

Requirements

The BA in Anthropology requires 36 credits, 15 in upper division core courses (ANTH 301 Cultural Anthropology, ANTH 315 Introduction to Archaeology, ANTH 355 Biological Anthropology, ANTH 350 Anthropological Theory, and ANTH 399 Professionalism & Practice in Anthropology). Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I	
English Composition - Level 2		
Select one English course from the following list ¹		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication ²		
Area II: Mathematics		3-4
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G ²		
MATH 1350G	Introduction to Statistics (recommended)	10-11
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ^{3,4}		
Area III: Laboratory Sciences (4 credits)		
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab (recommended, not required)	
Area IV: Social/Behavioral Sciences (3 credits)		
The following are recommended but not required.		
ANTH 1115G	Introduction to Anthropology	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 or 3 credits)		
Area V: Humanities ²		3
Area VI: Creative and Fine Arts ²		3
General Education Elective ²		3-4
Viewing A Wider World ⁵		6
Departmental/College Requirements		
ANTH 301	Cultural Anthropology	3
ANTH 315	Introduction to Archaeology	3
ANTH 350	Anthropological Theory	3
ANTH 355	Biological Anthropology	3
ANTH 399	Professionalism & Practice in Anthropology	3

ANTH 301, ANTH 315, and ANTH 355 may be taken in any order that best suits the student's interests.

Departmental Electives

Select additional electives in anthropology to bring total credits in major to 36, including 27 upper-division. 15

Second Language Requirement: (required- see below)

Electives, to bring the total credits to 120 49-52

Students must graduate with 48 upper-division.

Total Credits 120

¹ A grade of C- or better must be earned.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area.

⁴ All students must take one Area III: Laboratory Science (4 credits), one Area IV: Social/Behavioral Science Course (3 credits) and one additional course in either area (3-4 credits) in order to complete the requirement.

⁵ Students must complete two Viewing the Wider World Courses (p. 224) (VWW) for a total of 6 credits. One VWW must be from outside of the College of Arts and Sciences, and the second must be from outside of Anthropology. A student may substitute three credits taken as study abroad for one of the VWW course requirements.

Second Language Requirement

For the Bachelor of Arts in Anthropology, all majors must reach a one year proficiency in a foreign language (through 1120 level, completed with a C- or better) or equivalent/placement. Student who choose to earn the Concentration in Culture and Language must reach a two year proficiency in a foreign language (through 2120 level with a C- or better) or equivalent/placement. The options to complete these requirements are listed below. The number of credits that a student needs to take may vary depending on what level of language proficiency they already possess. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree. Please note that language immersion courses are available through the Office of Experiential Learning and Education Abroad.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14

SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6

For Heritage Speakers:

SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9
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Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 or 2120 level for the following courses:		
CHIN 2120 or FREN 2120 or GRMN 2120 or JAPN 2120 or SPAN 2120	Mandarin Chinese IV French IV German IV Japanese IV Spanish IV	3
<i>OR</i>		
Challenge the 1120/2120 level for the following courses:		
PORT 1120 or SPAN 2210	Portuguese II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I or Composition I	4
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G		3
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory and Social/Behavioral Science: Select two of the Anthropology Gen Ed courses ¹		6-8
The following will count for the major:		
ANTH 1115G	Introduction to Anthropology	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
HNRS 2161G	Window of Humanity	
HNRS 2172G	Archaeology: Search for the Past	
Area V: Humanities or Area IV: Creative and Fine Arts ^{2,3}		3
Second Language 1110 or Placement ⁴		4
Area I: Communications, select one of the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities or Area VI: Creative and Fine Arts ^{2,3}		3
Second Language 1120 ⁴		4
Credits		30-32
Sophomore		
ANTH 301	Cultural Anthropology ⁵	3
Area I: Communications, select one of the following		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Second Language 2110 ⁴		3
Anthropology Elective Course or Core Course		3
General Education Elective Course ³		3-4
ANTH 315	Introduction to Archaeology ⁵	3
Area III: Laboratory Science Course ¹		4
Second Language 2120 ⁴		3
Anthropology and Archaeology Field Schools are typically offered in Summer		
ANTH 388	Intermediate Archaeological Field School	
ANTH 488	Archaeological Field School Advanced	
Elective Course(s)		5
Credits		30-31
Junior		
ANTH 350	Anthropological Theory (offered Fall only)	3
Viewing a Wider World Course ⁸		3

Anthropology Elective (Upper Division) ¹¹		3
Minor Course or Elective Course ⁹		3
ANTH 355	Biological Anthropology (offered Spring only) ⁵	3
ANTH 399	Professionalism & Practice in Anthropology (offered Spring only) ¹⁰	3
Viewing a Wider World Course ⁸		3
Minor Course or Elective Course ⁹		3
Minor Course or Elective Course ⁹		3
Summer Field Opportunities:		
Archaeological Field School ¹⁰		
Ethnographic Field School ¹⁰		
Elective Course		3
Study Abroad		
Credits		30
Senior		
Anthropology Elective Course (Upper Division) ¹¹		3
Anthropology Elective Course (Upper Division) ¹¹		3
Minor Course of Elective Course (Upper Division) ⁹		3
Minor Course of Elective Course (Upper Division) ⁹		3
Elective Course (Upper Division)		3
Elective Course (Upper Division)		3
Anthropology Elective Course (Upper Division) ¹¹		3
Minor Course or Elective Course (Upper Division) ⁹		3
Elective Course(s)		6
Credits		30
Total Credits		120-123

- Students must take one Area III: Laboratory Sciences course, one Area IV: Social/Behavioral Science Course and an additional course in either area in order to fulfill the General Education requirements.
- Students must take one Area V: Humanities course and one Area VI: Creative and Fine Arts Course in order to fulfill their General Education requirements. Students completing the Concentration in Culture and Language may take LING 2110G for their Area V requirement.
- See the General Education (p. 220) section of the catalog for a full list of courses.
- Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence. Language courses numbered 1110 and 1120 are needed for the basic foreign language requirement for the BA in Anthropology. Language courses numbered 2110 and 2120 are required for students pursuing the Concentration in Language and Culture.
- Core courses ANTH 301 Cultural Anthropology, ANTH 315 Introduction to Archaeology, and ANTH 355 Biological Anthropology may be taken in any order that best suits the student's academic development.
- Summer Course offerings commonly include ANTH 388 Intermediate Archaeological Field School, ANTH 488 Archaeological Field School Advanced, which follows logically from the ANTH 315 Introduction to Archaeology core class.
- Students are encouraged to Study Abroad or begin a minor in a related field, and a VWW course can often be an entry to a minor. Three credits of Study Abroad may substitute for one VWW requirement. Students completing the Concentration in Culture and Language may take LING 302V as one VWW requirement.
- Anthropology students often complete minors in related fields. It is recommended but not required. See faculty for advice about how to enhance your educational development with a minor.

⁹ Please note that ANTH 399 Professionalism & Practice in Anthropology is a capstone course for the degree and ideally should be taken in the Spring of the junior year, after completion or in conjunction with the Anthropology core courses. ANTH 399 is only offered in the Spring semester.

¹⁰ For summer field opportunities, consult a faculty advisor. Applications for summer field courses are usually due by mid March. Honors students in Anthropology are encouraged to seek out National Science Foundation - Research Experiences for Undergraduates Sites Programs in the Division of Social and Behavioral Sciences. The NMSU Honors College also offers the Honors College Scholarship for a self-designed international travel and research experience. Sophomore and Junior Crimson Scholars are eligible to apply.

¹¹ A minimum of 27 upper division credits in Anthropology is required overall. A minimum of 36 total credits in Anthropology is required for the B.A. degree.

Anthropology (Culture & Language) - Bachelor of Arts

The BA in Anthropology with a concentration in Culture and Language supports Anthropology majors who wish to develop a focus in cultural anthropology, linguistics, and foreign languages that develops the knowledge, skills, and abilities to navigate an increasingly globalized world. The concentration provides coursework that underpins successful international study abroad experiences, which enables students to gain cross-cultural experience needed for employment in transnational and international organizations and agencies.

A total of 12 credits earned with C- or above is required for the concentration along with non-departmental second language requirement demonstrating two years proficiency in a second language or equivalent/ placement.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I	
English Composition - Level 2		
Select one English course from the following list ¹		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication ²		3
Area II: Mathematics		3-4
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G ²		
MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ^{3,4}		
Area III: Laboratory Sciences (4 credits)		10-11
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab (recommended, not required)	

Area IV: Social/Behavioral Sciences (3 credits)		
The following are recommended but not required.		
ANTH 1115G	Introduction to Anthropology	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 or 3 credits)		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i> ²		3-4
Viewing A Wider World ⁶		6
Departmental/College Requirements		
ANTH 301	Cultural Anthropology ⁷	3
ANTH 315	Introduction to Archaeology ⁷	3
ANTH 350	Anthropological Theory ⁷	3
ANTH 355	Biological Anthropology ⁷	3
ANTH 399	Professionalism & Practice in Anthropology	3
<i>Concentration</i>		
LING 2110G	Introduction to the Study of Language and Linguistics ⁵	3
or LING 302V	Language and Society	
Select 9 credits from the following:		9
ANTH 305V	Contemporary Native Americans	
ANTH 306V	Peoples of Latin America	
ANTH 307V	Japanese Culture and Society: Anthropological Perspectives	
ANTH 313V	Ancient Mexico	
ANTH 330V	Magic Witchcraft and Religion	
ANTH 360V	Food and Culture Around the World	
ANTH 362V	Environmental Anthropology	
Courses in Language and Culture through the NMSU Office of Experiential Learning and Education Abroad, including FacultyLed International Programs ⁸		3-6
<i>Departmental Electives</i>		
Select additional electives in anthropology to bring total credits in major to 36, including 27 upper-division.		21
Second Language Requirement: (required- see below) ⁹		3-14
Electives, to bring the total credits to 120		11-28
Students must graduate with 48 upper-division.		
Total Credits		120

¹ A grade of C- or better must be earned.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area.

⁴ All students must take one Area III: Laboratory Science (4 credits), one Area IV: Social/Behavioral Science Course (3 credits) and one additional course in either area (3-4 credits) in order to complete the requirement.

⁵ Students completing the concentration in Culture and Language may take either LING 2110G Introduction to the Study of Language and Linguistics or LING 302V Language and Society, but not both to satisfy the core requirement (3 credits).

**Note: Students currently enrolled in the Anthropology program and who have completed ANTH 320 Anthropological Linguistics have fulfilled this*

- requirement. Please see the Anthropology department head to process a substitution form.
- 6 Students must complete two Viewing the Wider World Courses (p. 224) (VWW) for a total of 6 credits. One VWW must be from outside of the College of Arts and Sciences, and the second must be from outside of Anthropology. A student may substitute three credits taken as study abroad for one of the VWW course requirements.
- 7 ANTH 301 Cultural Anthropology, ANTH 315 Introduction to Archaeology, ANTH 350 Anthropological Theory, and ANTH 355 Biological Anthropology may be taken in any order that best suits the student's interests.
- 8 Study abroad and FLIP courses approved by the Anthropology Department Head.
- 9 Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence. Please see second language options below for other equivalencies and proficiency options.

Second Language Requirement

For the Bachelor of Arts in Anthropology, all majors must reach a one year proficiency in a foreign language (through 1120 level, completed with a C- or better) or equivalent/placement. Students who choose to earn the Concentration in Culture and Language must reach a two year proficiency in a foreign language (through 2120 level with a C- or better) or equivalent/placement. The options to complete these requirements are listed below. The number of credits that a student needs to take may vary depending on what level of language proficiency they already possess. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree. Please note that language immersion courses are available through the Office of Experiential Learning and Education Abroad.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 or 2120 level for the following courses:		
CHIN 2120	Mandarin Chinese IV	3
or FREN 2120	French IV	
or GRMN 2120	German IV	
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I or Composition I	4
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G		3
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	

MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory and Social/Behavioral Science: Select one of the Anthropology Gen Ed Courses ^{1,3}		6-8
The following will count for the major:		
ANTH 1115G	Introduction to Anthropology	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
HNRS 2161G	Window of Humanity	
HNRS 2172G	Archaeology: Search for the Past	
Area V: Humanities or Area IV: Creative and Fine Arts ^{2,3}		3
Second Language 1110 or Placement ⁴		4
Second Language 1120 ⁴		4
Area I: Communications, select one of the following		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
LING 2110G or LING 302V	Introduction to the Study of Language and Linguistics or Language and Society	3
Credits		30-32
Sophomore		
ANTH 301	Cultural Anthropology ⁵	3
Area I: Communications, select one of the following		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Second Language 2110 ⁴		3
Second Language 2120 ⁴		3
Anthropology Elective Course, Concentration Elective, or Core Course		3
General Education Elective Course ³		3-4
ANTH 315	Introduction to Archaeology ⁵	3
Area III: Laboratory Science Course ¹		4
Elective Courses		5
Anthropology and Archaeology Field Schools are typically offered in Summer ⁶		
ANTH 388	Intermediate Archaeological Field School	
ANTH 488	Archaeological Field School Advanced	
Credits		30-31
Junior		
ANTH 350	Anthropological Theory (offered Fall only)	3
Viewing a Wider World Course ^{3,7}		3
Anthropology Elective or Concentration Elective (Upper Division)		3
ANTH 355	Biological Anthropology (offered Spring only) ⁵	3
ANTH 399	Professionalism & Practice in Anthropology (offered Spring only) ⁹	3
Viewing a Wider World Course ^{3,7}		3
Minor Course or Elective Course ⁸		3
Minor Course or Elective Course ⁸		3
Minor Course or Elective Course ⁸		3

Elective Course ⁸	3
Summer Field Opportunities: ¹⁰	
Archaeological Field School ¹⁰	
Ethnographic Field School ¹⁰	
Study Abroad (credits may be applied to Concentration coursework) ⁴	

Credits	30
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Senior

Anthropology Elective Course (Upper Division)	3
Concentration Elective Course	3
Concentration Elective Course	3
Minor Course or Elective Course (Upper Division) ⁸	3
Minor Course or Elective Course (Upper Division) ⁸	3
Minor Course or Elective Course (Upper Division) ⁸	3
Elective Course (Upper Division)	3
Elective Course (Upper Division)	3
Elective Course(s)	6

Credits	30
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Total Credits	120-123
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- Students must take one Area III: Laboratory Sciences course, one Area IV: Social/Behavioral Science Course and an additional course in either area in order to fulfill the General Education requirements.
- Students must take one Area V: Humanities course and one Area VI: Creative and Fine Arts Course in order to fulfill their General Education requirements.
- See the General Education (p. 220) section of the catalog for a full list of courses.
- Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence. Language courses numbered 1110 and 1120 are needed for the basic foreign language requirement for the BA in Anthropology. Language courses numbered 2110 and 2120 are required for students pursuing the Concentration in Language and Culture.
- Core courses ANTH 301 Cultural Anthropology, ANTH 315 Introduction to Archaeology, and ANTH 355 Biological Anthropology may be taken in any order that best suits the student's academic development.
- Summer Course offerings commonly include ANTH 388 Intermediate Archaeological Field School, ANTH 488 Archaeological Field School Advanced, which follows logically from the ANTH 315 Introduction to Archaeology core class. Archaeological Field School is 6 credits and counts as upper division Anthropology elective class. It is also required for employment placement in the archaeology and cultural resource management industry.
- Students are encouraged to Study Abroad or begin a minor in a related field, and a VWW course can often be an entry to a minor. Three credits of Study Abroad may substitute for one VWW requirement. Students completing the Concentration in Culture and Language may take LING 302V as one VWW requirement.
- Anthropology students often complete minors in related fields. It is recommended but not required. See faculty for advice about how to enhance your educational development with a minor.
- Please note that ANTH 399 Professionalism & Practice in Anthropology is a capstone course for the degree and ideally should be taken in the Spring of the junior year, after completion or in conjunction with the Anthropology core courses. ANTH 399 is only offered in the Spring semester.

¹⁰ For summer field opportunities, consult a faculty advisor. Applications for summer field courses are usually due by mid March. Honors students in Anthropology are encouraged to seek out National Science Foundation - Research Experiences for Undergraduates Sites Programs in the Division of Social and Behavioral Sciences. The NMSU Honors College also offers the Honors College Scholarship for a self-designed international travel and research experience. Sophomore and Junior Crimson Scholars are eligible to apply.

Anthropology - Undergraduate Minor

Students who earn a minor in Anthropology must earn 18 credits, distributed as follows:

Prefix	Title	Credits
Required Courses		
Select one from the following:		3
ANTH 301	Cultural Anthropology	
ANTH 315	Introduction to Archaeology	
ANTH 350	Anthropological Theory	
ANTH 355	Biological Anthropology	
Upper division Anthropology courses 300 or above		9
Anthropology courses (any level)		6
Total Credits		18

Students who earn a B.A. in Anthropology may **not** also earn a minor in Anthropology. Students earning the minor must pass 18 credits with grades of C- or higher. Nine of the credits must be upper-division. Students may count S only in courses in which all grades are S/U.

Archaeology - Undergraduate Minor

The Undergraduate Minor in Archaeology is an interdisciplinary program through which students develop a deeper understanding of global culture change and the long-term anthropogenic impacts to our planet. Archaeologists use the material evidence of landscapes, sites, and artifacts to reconstruct past lifeways and interpret human behavioral variation and cultural change. They apply their knowledge to promote stewardship of cultural resources and respect for diverse pasts. The minor offers students the opportunity to acquire training in archaeology through experiential learning of field data collection techniques, laboratory analysis of archaeological materials, and cross disciplinary skills needed for careers in public and private cultural resource management, historic preservation, and heritage conservation. NMSU occupies a strategic position as a land grant institution in a multi-cultural regional setting, combined with its geographic location on a binational border. Students in different programs can use the minor in archaeology to enhance their undergraduate degrees and prepare themselves professionally to seek careers and graduate degrees in archaeology, public lands management, environmental sciences, public history, geography, or teaching.

The minor requires 18 credit hours, distributed as follows.

- At least 12 credits must be earned in upper division (300+) courses.
- At least one course and no more than two courses (6 credits) must be earned in a field other than Anthropology.
- At least three credits must be earned in each division – required, area studies, field methods, and laboratory methods.

Prefix	Title	Credits
Required Courses		18
ANTH 315	Introduction to Archaeology (required Archaeological Method & Theory course)	
<i>Select a minimum of 3 and a maximum of 6 credits in Area Studies in Archaeology from the following:</i>		
ANTH 1160G	World Archaeology	
GEOL 1110G	Physical Geology	
HNRS 2172G	Archaeology: Search for the Past	
ANTH 312	The Ancient Maya	
ANTH 313V	Ancient Mexico	
ANTH 467	Archaeology of the American Southwest	
ANTH 318	Historical Archaeology	
ANTH 414	The Archaeology of Religion	
HIST 371	Greek Civilization: From Helen of Troy to Alexander the Great	
HIST 372	Roman Civilization	
<i>Select a minimum of 3 and a maximum of 6 credits in Field Methods from the following:</i>		
ANTH 389	Archaeological Mapping	
ANTH 388	Intermediate Archaeological Field School	
or ANTH 488	Archaeological Field School Advanced	
GEOG 353	Geomorphology	
<i>Select a minimum of 3 and a maximum of 9 credits in Laboratory Methods and Analysis from the following:</i>		
ANTH 375	Pottery Analysis in Archaeology	
ANTH 376	Lithic Technology Organization	
ANTH 378	Introduction to Lab Methods in Archaeology	
ANTH 464	Curation Crisis in Archaeology	
ANTH 474	Human Osteology	
ANTH 477	Zooarchaeology	
GEOG 381	Cartography and Geographic Information Systems	
GEOL 1150	Introduction to Rocks and Minerals (pre/co-requisite GEOL 1110G)	
Total Credits		18

Notes:

- Students who earn a B.A. in Anthropology may also earn a minor in Archaeology.
- Students earning the minor must pass 18 credits with grades of C- or higher.
- Students may count S grades only in courses in which all grades are S/U.
- Alternate courses may be substituted with approval of the advisor for the minor.

Medical Anthropology - Undergraduate Minor

Program Overview and Objective

The goal of the Undergraduate Minor in Medical Anthropology is to help students develop a critical biocultural understanding of human health, disease, and illness. Students will learn about cultural, epidemiological, and evolutionary approaches to understanding health, wellness, and the body; culture and healing systems; social and structural determinants of health disparities; global/international health; human variation and

adaptation; and engaging with diverse communities on health issues. The minor is particularly appropriate for students who are pursuing careers in health professions.

Students who earn a minor in Medical Anthropology must complete 18 credits. ANTH 357V Medical Anthropology is required. A grade of C- or better must be obtained for each course. Students may count S grades only in courses in which all grades are S/U, and no more than 6 hours of S credit can be accepted. Students may count no more than 15 credits in Anthropology. Please contact the Department of Anthropology regarding the minor.

Prefix	Title	Credits
Required Course		
ANTH 357V	Medical Anthropology	3
Elective Courses (within Department)		15
Select a minimum of 9 credits and a maximum of 12 credits		
ANTH 402	Contemporary Medical Anthropology	
ANTH 431V	Nutritional Anthropology	
ANTH 435	Human Health and Biological Variation	
ANTH 436	Evolutionary Medicine	
ANTH 458	Fertility, Reproduction and Birth	
ANTH 468	Applied Medical Anthropology	
ANTH 385	Internship in Anthropology (with permission of Anthropology Department Head)	
Elective Courses (outside of Department)		
Select a minimum of 3 credits and a maximum of 6 credits		
BIOL 353	Pre-Professional Human Anatomy (prerequisite BIOL 2110G/L)	
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	
BIOL 354	Physiology of Humans (prerequisite BIOL 2110G/L)	
BIOL 354 L	Laboratory of Human Physiology	
CEPY 1120G	Human Growth and Behavior	
PHLS 3110V	Human Sexuality	
PHLS 3130V	Global Environmental Health Issues	
PHLS 3120V	Women's Health Issues	
PHLS 4620V	Cross-Cultural Aspects of Health	
PSYC 325	Health Psychology (prerequisite PSYC 1110G)	
Students may substitute other offerings in Human Biology, Anatomy, and Physiology (check prerequisites) with permission of Anthropology Department Head.		
Total Credits		18

Sustainability- Undergraduate Minor

The Undergraduate Minor in Sustainability is an interdisciplinary program through which students develop a deeper understanding of the relations between humans and the natural environment. The minor offers students the opportunity to cross disciplines and construct a coherent interdisciplinary program that focuses on:

- Human interactions with the natural environment
- Society's role in depleting and transforming natural resources
- Critical issues in sustainable development
- New strategies for conserving natural resources and/or sustainable agricultural production

NMSU occupies a unique strategic position as a land grant institution in a multi-cultural regional setting, combined with its geographic location

on a binational border. Students in different programs can use the minor in sustainable development to enhance their undergraduate degree and prepare themselves professionally to seek careers and graduate degrees in sustainable and international development.

A minor in Sustainability is available for students who want to include sustainable development in their academic training. The minor requires **18 credit hours**.

NMSU occupies a unique strategic position as a land grant institution in a multi-cultural regional setting, combined with its geographic location on a binational border. Students in different programs can use the minor in sustainability to enhance their undergraduate degree and prepare themselves professionally to seek careers and graduate degrees in sustainable and international development.

A minor in Sustainability is available for students who want to include sustainable development in their academic training. The minor requires **18 credit hours**.

Requirements

Prefix	Title	Credits
Core Courses ¹		
Choose 18 credits from the following:		18
AEEC 315V	World Agriculture and Food Problems	
or GEOG 315V	World Agriculture and Food Problems	
AEEC 337V	Natural Resource Economics	
or ECON 337V	Natural Resource Economics	
AEEC 384V	Water Resource Economics	
or ECON 384V	Water Resource Economics	
AXED 3210V	John Muir: Lessons in Sustainability	
EPWS 380V	Science & Society	
ANTH 360V	Food and Culture Around the World	
ANTH 362V	Environmental Anthropology	
GEOG 325V	New Mexico and the American West	
GEOG 357	Climatology	
GEOG 361V	Challenges of Globalization	
GEOG 363V	Cultural Geography	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
HNRS 321V	Agriculture in an Interconnected World	
PHLS 3130V	Global Environmental Health Issues	
PHYS 303V	Energy and Society in the New Millennium	
POLS 324	Environmental Policy & Administration	
SOCI 3310V	Social Issues in the Rural Americas	
SOCI 4335V	Advanced Environmental Sociology	

¹ Students who wish to substitute 3 credits of internship for one of the above listed classes may do so with permission of the Department Head, Anthropology. Suggested internship courses would include ANTH 385 Internship in Anthropology, ANTH 486 Community Engagement and Service Learning, or GEOG 401 Internship/Co-op.

Religious Studies - Undergraduate Minor

The Undergraduate Minor in Religious Studies introduces students to the diversity and history of religious experiences enabling them

to evaluate critically the roles religion plays in cultures of the world. Students engage with the study of religion across disciplines including Anthropology, Art History, History, Native American Studies, Government, History, Native American Studies, and Sociology. The curriculum covers archaeological evidence of religion, new religious movements, religious iconography, forms of religious organization, politics and religion, and religious violence. The minor is particularly appropriate for students who pursue careers impacted by religious practices and beliefs such as health professions, legal careers, government agencies, religious vocations, and charitable organizations.

Students must take the required core class ANTH 330V Magic Witchcraft and Religion. Students must pass a total of 18 credits of which at least 9 are upper division. Students must earn C- or higher grades in each course and cannot count S/U courses unless all grades in the course are S/U. No more than 9 credits (upper or lower division) can be earned in any one department. Please contact the Department of Anthropology regarding substitutions and questions for the minor.

Requirements

Prefix	Title	Credits
Required Courses		
ANTH 330V	Magic Witchcraft and Religion	3
Select 15 credits from the following: ¹		15
At least 9 credits must be upper division		
ANTH 2140G	Indigenous Peoples of North America	
ANTH 307V	Japanese Culture and Society: Anthropological Perspectives	
ANTH 313V	Ancient Mexico	
ANTH 414	The Archaeology of Religion	
NATV 4120V	Native American Visual Culture	
ANTH 455	Federal Indian Policy	
ARTH 305	Medieval Art	
ARTH 310	Native American Art	
ARTH 311	Art of China I: Neolithic to Song Dynasty	
ARTH 444	Art and Life in Renaissance Italy	
ENGL 2521	The Bible as Literature	
ENGL 392V	Mythology	
ENGL 407	Milton	
HIST 2245G	Islamic Civilization to 1500	
HIST 2246G	Islamic Civilizations since 1800	
HIST 2250G	East Asia to 1600	
HIST 471	China through the Ming Dynasty	
HIST 473	History of Japan	
HNRS 2160G	New Testament as Literature	
HNRS 2171G	The Worlds of Arthur	
HNRS 2172G	Archaeology: Search for the Past	
HNRS 326V	Art and Mythology	
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	
HNRS 362V	Native American Philosophy and Spirituality	
PHIL 1140G	Philosophy and World Religions	
PHIL 331	Philosophy of Religion	
SOCI 3110V	Sociology of Religion	
Total Credits		18

Art Undergraduate Program Information

Within the scope of the university’s land-grant mission, the Department of Art capitalizes on its unique geographic location to serve and reflect diverse border communities, support learning that combines innovative and hybrid techniques, critical and cultural theory, contemporary exhibitions, and art historical inquiry. Capitalizing on the specialties and research agendas of our faculty, we provide an environment and a platform for aesthetic and critical engagement through the application of studio, art historical and theoretical methodologies. Our curriculum fosters learning through immersion in experimental, collaborative and cross-disciplinary activity. Students develop their artistic aesthetic and professional growth by engaging with a variety of approaches to their individual research practice. Students research also includes critique and discourse related to the context of both historical and contemporary issues, and the development of new strategies of inquiry into contemporary culture and knowledge. As artists, historians, and conservators, we provide a space for active engagement with varied disciplines in local, national and international communities.

The department offers four undergraduate degrees: a Bachelor of Arts (BA) with a concentration in Studio Art, a BA with a concentration in Art History, a Bachelor of Fine Arts (BFA) in Studio Art and a BFA in Museum Conservation. Our studio degrees provide students with the opportunity to either specialize or diversify their program of study in the following media areas: graphic design and media arts, ceramics, sculpture, metals and jewelry, photography and lens-based media, painting and drawing and museum conservation. We also support students who are interested in research practices in installation, performance and multi-media.

BA in Art History – This program is designed to give students a broad familiarity with the visual arts through the study of aesthetics, cultural contexts, pictorial traditions, stylistic development and technical practices.

BA in Studio Art – The BA provides a solid background in materials, techniques and idea development across all media areas combined with art historical studies. Students have the opportunity to specialize or generalize in various medias.

BFA in Studio Art – The BFA curriculum provides students with a multidisciplinary understanding of contemporary visual arts. Students who wish to embark on a professional career in art apply to the BFA program through a portfolio process in their sophomore year. Areas of potential specialization include photography and lens-based media, graphic design and media arts, ceramics, drawing, painting, jewelry/ metalsmithing, and sculpture. Students may also elect to focus on several areas of specialization for an intermedia concentration. This degree culminates with a BFA thesis exhibition.

BFA in Museum Conservation - the BFA in Museum Conservation is an interdisciplinary degree, combining the studio arts, art history, anthropology, history, chemistry and conservation technologies to yield skills in the conservation of material objects of all types and historical value. NMSU offers one of only a few undergraduate degrees in museum conservation in the country.

The study of art provides an appropriate background for the pursuit of careers in studio art and art history in such areas as: the visual arts; graphic design; conservation; library work; museum work; advertising; architecture and interior design; photography; crafts; cinematography;

education and art therapy; publishing; theatre; set design; television; industry and business; communication; management and research in the creative and academic areas. A major in art also provides students with a broad humanistic background appropriate to preparation for advanced degrees in other fields.

Graduate Program Information

The Department of Art offers a Master of Fine Arts in Studio Art and Master of Arts with an emphasis in Art History. Graduate students focus on an individualized program of study, supported by required coursework and mentorship with the graduate faculty. Students are encouraged to work across disciplines and cultivate their personal research within the broad context of 21st-century art, art history and theory. The department supports work in and across the following areas: ceramics, graphic design, time-based media, lens-based media, jewelry and metalsmithing, painting and drawing, sculpture and museum conservation.

Degrees for the Department

Bachelor Degree(s)

- Art (Art History) - Bachelor of Arts (p. 474)
- Art (Museum Conservation) - Bachelor of Fine Arts (p. 477)
- Art (Studio Art) - Bachelor of Arts (p. 476)
- Art (Studio Art) - Bachelor of Fine Arts (p. 479)

Master Degree(s)

- Art - Master of Arts (p. 100)
- Fine Arts - Master of Fine Arts (p. 147)

Minors for the Department

- Art - Undergraduate Minor (p. 481)
- Art History - Undergraduate Minor (p. 481)
- Museum Conservation - Undergraduate Minor (p. 481)

Professor, Margaret Goehring, Department Head

Professors Cully, Goehring; **Associate Professors** d'Agostino, Furuhashi
Assistant Professors Clark, Lamb; **College Associate Professors** Cole-Dorn
College Assistant Professor Marinas-Feliner; **Museum Director** Sage;
Conservator Marinas-Feliner

J. Clark, MFA (Cranbrook Academy of Art)- Ceramics; T. Cole-Dorn, MFA (New Mexico State University)- Painting and Drawing; C. Cully, MFA (University of Arizona)- Painting and Drawing; B. d'Agostino MFA (University of Maryland Baltimore County)- Graphic Design; M. Furuhashi, MFA (University of Illinois- Champagne)- Jewelry and Metals; M. Goehring, Ph.D. (Case Western Reserve)- Art History; B. Lamb, MFA (University of New Mexico)-Photography; S. Marinas-Feliner, MA Art Conservation (Universidad Complutense de Madrid, Spain) and MA Anthropology (New Mexico State University)- Art Conservator; M. Sage, MFA (MICA)- University Art Museum Director;

Art History Courses

ARTH 1115G. Orientation in Art

3 Credits (2+3P)

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.

Learning Outcomes

1. Identify elements of art principles of design.
2. Articulate the relationship of art to the human experience.
3. Write and discuss critically using the vocabulary of art.
4. Interpret art within cultural, social, personal, and historical contexts.
5. Critically analyze an original work of art.

ARTH 2110G. History of Art I

3 Credits (3)

This survey course explores the art and architecture of ancient pre-historic cultures through the end of the fourteenth century. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development.

Learning Outcomes

1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2120G. History of Art II

3 Credits (3)

This survey course will explore the architecture, sculpture, ceramics, paintings, drawings, and glass objects from the 14th century to the modern era. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development. May be repeated up to 3 credits.

Learning Outcomes

1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2136. Writing in Art**3 Credits (3)**

This class looks at the variety of writings associated with art history and studio art practice. It explores the discipline of art history itself, and introduces students to the specific ways in which art historians study art. Within a workshop setting, students will practice approaches to research, understanding art and writing about art. Students will also be introduced to professional writing practices, including digital formats, relating to studio art.

Learning Outcomes

1. Develop visual literacy in looking at art 2 .Analyze a complex art historical argument
2. Apply art specific vocabulary to critically-based writings and discussions of art
3. Develop writing skills to articulate the relationship of art to the human experience

ARTH 300. Special Topics in Art History**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes, individual topics may not be repeated . Restricted to Las Cruces campus only. May be repeated up to 12 credits.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.

Learning Outcomes

1. Analysis of specific problems in art history
2. Evaluate approaches to specific problems in art history

ARTH 305. Medieval Art**3 Credits (3)**

History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ARTH 505.

Prerequisite(s): ARTH 2110G, ARTH 2120G, and ARTS 2671 or consent of instructor.

ARTH 310. Native American Art**3 Credits (3)**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. Considers the artistic expression and the function of art in diverse cultural and environmental contexts.

Prerequisite(s): ARTH 2110G, ARTH 2120G, and ARTS 2671 or consent of instructor.

ARTH 311. Art of China I: Neolithic to Song Dynasty**3 Credits (3)**

Survey of the art of China from the neolithic period to the end of the Song dynasty. Non-majors welcome.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2670 or HIST 2250G and HIST 2251G or consent of instructor.

Learning Outcomes

1. identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices
4. identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Taoist iconography

ARTH 312. Art of China II: Song Dynasty to Today**3 Credits (3)**

Survey of art, architecture and landscape design of China from the Song Dynasty to the present day Crosslisted with: ARTH 512.

Prerequisite(s): ARTS 2671 or ARTH 2110G or HIST 2250G and HIST 2251G or consent of instructor.

ARTH 330. Modern Architecture**3 Credits (3)**

A survey of the history of Modern Architecture with focus given to major architects, monumental buildings, and building groups stressing construction techniques and style from the 18th century to the present.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 336. Race and Art**3 Credits (3)**

Traces race, representation and appropriation through a historical and cultural lens. Issues of identity up to and including contemporary visual expression are examined. Non-majors welcomed. Each topic may be taken one time.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.

Learning Outcomes

1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience

ARTH 339. History of Photography**3 Credits (3)**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. May be repeated up to 3 credits.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 342. Global Modernisms**3 Credits (3)**

Examines themes and monuments from the late 19th century to 1968, emphasizing modern and avant-garde cultural practices.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136, or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerged in the Twentieth Century
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding Twentieth Century Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the human experience.

ARTH 343. Contemporary Global Art Practices**3 Credits (3)**

Examines the myriad of contemporary art practices, media, and forms from 1968 to the present.

Prerequisite: ARTH 2120G, ARTH 2136; or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the contemporary human experience.

ARTH 344. Gender, Sexuality, and Art in the Americas**3 Credits (3)**

This course examines woman power/trans/ queer discourses of both the global south and those of people of color in the United States in relation to art from Latin, Central, and North America.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 345. Latin American Film**3 Credits (3)**

Surveys films and their histories from Latin American and the LatinX diaspora.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic

ARTH 346. Museum and Curatorial Studies**3 Credits (3)**

This museum and curatorial studies course surveys practices, objects, and histories.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 390. Visual Culture of the 1960s**3 Credits (3)**

Focus on major cultural trends and historical events in 1960's America. Offers analysis of art, films, and pop culture phenomena of the period.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 444. Art and Life in Renaissance Italy**3 Credits (3)**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself. 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, titian, humanism, the Medici, and republican and courtly culture.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 477. Independent Research in Art History**1-9 Credits (1-9)**

Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required.

Learning Outcomes

1. Student will analyze approaches to a problem in art history
2. Student will evaluate approaches to a problem in art history
3. Student will formulate approaches to address a problem in art history

ARTH 478. Seminar in Art History**3 Credits (3)**

Reading, research, and discussion of advanced problems. Topics will be announced in the course schedule. Each topic may be only taken once. Non-art/art history majors, contact instructor for consent.

Prerequisite: ARTH 2110G, ARTH 2120G and ARTH 2136, and one 300 level ARTH course or consent of instructor.

Learning Outcomes

1. Analyze problems in art history
2. Propose a hypothesis relating to a problem in art history and support conclusions through research
3. Evaluate various approaches to problems in art history

ARTH 479. Methodologies and Theories of Art and Art History**3 Credits (3)**

Theories and methodologies in art, art history and art criticism; taught with ARTH 579

Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136 and one 300 level art history course or consent of instructor.

Learning Outcomes

1. understand the history of the discipline of art history, its origins, and its institutional developments
2. Assess the strengths and limitations of various approaches and methods to interpreting works of art
3. identify the methodology employed in an art historical argument
4. apply a variety of methodological and critical approaches to interpreting a work of art and assess the strengths and limitations of those applications
5. recognize strategies of art practice that correspond to different methodological and critical approaches

ARTH 500. Special Topics in Art History**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. Individual topics may only be taken one time. Students must be Graduate students to enroll.

Learning Outcomes

1. Analyze specific problems in Art History
2. Evaluate approaches to specific problems in Art History

ARTH 510. Advanced Native American Art**3 Credits (3)**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. The artistic expression and the function of art considered in diverse cultural and environmental contexts. Crosslisted with: ARTH 310.

Prerequisite(s): Graduate standing.

ARTH 511. Art of China I: Neolithic to Song Dynasty**3 Credits (3)**

Survey of the art of China from the neolithic period to the Song dynasty. Student must be a Graduate student to enroll.

Learning Outcomes

1. Identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. Describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices.
4. Identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Daoist iconography

ARTH 536. Race and Art**3 Credits (3)**

This course explores the visual expression of race and identity in art and visual culture from a diverse geographical and historical range. Each topic may only be taken one time. Crosslisted with: ARTH 336. Students must be Graduate students to enroll.

Learning Outcomes

1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. Identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience.
5. Formulate a question concerning race and art and using analysis, evaluate the research on that question and create an original argument.

ARTH 539. History of Photography**3 Credits (3)**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. Crosslisted with: ARTH 339.

Prerequisite(s): Graduate standing.

ARTH 542. Global Modernisms**3 Credits (3)**

Examines themes and monuments of created from the end of the 19th century to 1968 emphasizing modern and avant-garde cultural practices. Crosslisted with: ARTH 342. Students must be Graduate students to enroll.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles that emerged in the early Twentieth Century to 1968
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding the art of this period
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in art history relating to the topic of the course, evaluate and assess research, and create an original argument concerning that problem

ARTH 543. Contemporary Global Art Practices**3 Credits (3)**

Examines the myriad of contemporary art practices, media, and forms from 1968 to the present. Crosslisted with: ARTH 343. Students must be in Graduate standing to enroll.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in contemporary art, evaluate and assess research, and create an original argument concerning that problem

ARTH 544. Gender, Sexuality, and Art in the Americas**3 Credits (3)**

This course examines woman power/trans/ queer discourses of both the global south and people of color in the United States in relation to art from Latin, Central, and North America. Cross-listed with ARTH 344. Students must be in graduate standing to enroll.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 545. Latin American Film**3 Credits (3)**

Surveys films and their histories from Latin American and the LatinX diaspora. Taught with ARTH 345. Students must be in graduate standing to enroll.

Learning Outcomes

1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic works

ARTH 546. Museum and Curatorial Studies**3 Credits (3)**

This museum and curatorial studies course surveys practices, objects, and histories. Taught with ARTH 346. Students must be in graduate standing to enroll.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 578. Seminar in Art History**3 Credits (3)**

Reading, research, and discussion of advanced problems in art history; rotating topics will be announced in the course schedule. Individual topics may only be taken once. Student must be Graduate students to enroll.

Learning Outcomes

1. Analyze advanced problems in art history
2. Evaluate approaches to advanced problems in art history

ARTH 579. Graduate Seminar: Art Theory, Criticism, Historiography**3 Credits (3)**

Theories and methodologies in art history and art criticism.

Prerequisite: graduate standing.

ARTH 597. Independent Study in Art History**3 Credits (3)**

Supervised independent study in topics in art history. Students must be in graduate standing to enroll.

Learning Outcomes

1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

ARTH 599. Art History Thesis**1-15 Credits (1-15)**

Art history master's thesis research. Students must be in Graduate standing to enroll.

Learning Outcomes

1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

Studio Art Courses

ARTS 1121. Foundations in Art**3 Credits (2+4P)**

The Foundations course will focus on a deceptively simple question. "What is Contemporary Art, and how can we make it?" Through the exploration of basic visual design concepts, collaborative learning, and interdisciplinary studio production, this course will help us to discover what it means to be an artist in the 21st century.

Learning Outcomes

1. Create original works of art through the investigation of ideas and concepts resulting in the communication of meaning. Develop forms that convey meaning.
2. Evaluate works of art through critiques that appraise how the form communicates meaning. Justify the decisions that were made in the use and application of the chosen medium and form to communicate meaning in a work of art.
3. Analyze the differences in clarity of communication between works of art based subject matter, medium and form.
4. Apply knowledge provided in lectures to produce works of art that communicate meaning. Demonstrate an ability to express concepts in visual form.
5. Understand how the choice of subject matter, medium and form translate in the expression of concepts through discussion and description.
6. Remember the fundamental tenets of art, elements and principles of design, through the duplication of them in works of art as well their use in discussions.

ARTS 1145G. Visual Concepts**3 Credits (2+4P)**

Visual Concepts is an introduction to the philosophies of art, visual thinking, and principles of visual organization. Designed to give students a broad view of aesthetic traditions, ideologies, and techniques basic to the creation and evaluation of art. Principles and concepts are taught in a common lecture and applied in parallel small studio sections. For non-art majors only.

Learning Outcomes

1. Develop understanding of history, major styles and contemporary issues in art.
2. Introduce students to the language of visual perception and aesthetic evaluation.
3. Introduce students to the fundamental processes of visual perception and artistic expression.
4. Develop students' confidence in using various art materials for artistic expression.
5. Develop students' ability to verbalize ideas and processes in art making.
6. Develop student's ability to communicate through writing about art and art experiences.

ARTS 1240. Design I**3 Credits (3)**

This course introduces the fundamentals of two-dimensional design as it applies to fine art and commercial contexts. Emphasis will be on basic color theory, elements of dynamic composition, vocabulary of visual arts and design, and development of visual conceptual skills. Students will use a variety of materials and techniques. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Produce art works that apply and organize the elements of two-dimensional form (line, shape, value, texture, color and space).
2. Produce artworks that apply the principles of two-dimensional design (harmony, variety, repetition, balance, rhythm, proportion, dominance, movement, and economy).
3. Demonstrate effective use of materials and techniques with consideration for craftsmanship and presentation.
4. Use visual art vocabulary in the development and critique of work
5. Explore concepts and ideas: from conceptual, realistic/referential to non-representational

ARTS 1250. Design II**3 Credits (3)**

This course introduces the basic formal (aesthetic), spatial, and physical aspects of 3-D form as they can be applied to sculptural and functional design. Techniques that explore structure, mass, volume, scale, surface, form, and function are covered, along with various media, which may include paper, wood, clay, and/or metal. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Apply the artistic qualities of the elements of art and principles of design to three-dimensional form.
2. Create 3 dimensional form using varied sculptural methods, construction techniques and media.
3. Produce 3 D design projects safely with proper use of equipment and materials.
4. Apply realistic, referential, and abstract concepts and ideas to projects.
5. Demonstrate knowledge of 3-D related art vocabulary, origin and trends in sculpture, and 3-D design fundamentals.

ARTS 1310. Introduction to Ceramics**3 Credits (2+4P)**

This course introduces the technical processes and conceptual concerns of working with ceramic material. Various methods of forming functional and expressive works out of clay are explored. Methods used include handbuilding and throwing, basic clay bodies, slip and glaze, and atmospheric firing.

Learning Outcomes

1. Explain the transformation of the ceramic material from raw clay form to glazed ceramic object
2. Demonstrate proficiency of technical ceramic skills
3. Explain larger concepts and design principles
4. Apply basic 3-D design principles in the formation of a work of art, as they apply to the ceramic media
5. Create ceramic works of art based on conceptual prompts
6. Critically evaluate a variety of artwork
7. Gain an understanding of the history of ceramic art from a multicultural perspective

ARTS 1320. Ceramics I**3 Credits (2+4P)**

An introduction to the medium of clay incorporating hand building and wheel throwing to introduce the student to both the sculptural and utilitarian uses of clay. The student will also be introduced to a variety of glazing and firing techniques

Learning Outcomes

1. Demonstrate through critical discourse or writing an introductory knowledge of the history of ceramics, and ceramic language and terminology.
2. Demonstrate through mechanical application an introductory knowledge of the properties of clays, glazes, and a variety firing techniques.
3. Produce a body of work that exemplifies good ceramic design through the effective use of form, surface, and color.
4. Through the production a body of work demonstrate competency in hand building and throwing on the wheel.

ARTS 1410. Introduction to Photography**3 Credits (2+4P)**

This course introduces the making of photographic images from a broad viewpoint to consider both as an art practice and as a cultural practice. The course covers technical information on camera use and functionality, composition and visual design, digital workflow and editing, professional functions of manipulating and enhancing images, and printing correctly and effectively. The historical aspects of photography are also covered. May be repeated up to 3 credits.

Learning Outcomes

1. Gain fluency with basic camera function as well as a working knowledge of other photographic equipment and software to produce technically competent photographs
2. Have a familiarity with current image-editing software to enhance images as well as developing a digital workflow for the management of digital images
3. Be able to develop creative solutions to visual photographic problems
4. Gain awareness of contemporary issues in contemporary art photographic practice that can be applied to the one's own individual practice
5. Develop the ability to critically analyze and discuss photographic images
6. Print and produce a final project that demonstrates synthesis of ideas presented in the course readings, critiques, and individual research
7. Demonstrate photographic terminology, and the many ways photographs function in society, both currently and historically

ARTS 1520. Digital Media I**3 Credits (2+4P)**

This course provides an introduction to two of Adobe's major software applications, Illustrator and Photoshop, which are essential in creating artwork, designing promotional materials, websites and more. Part of the course deals with creating a variety of documents using the major tools of each program, and gaining an understanding of the contemporary graphic design industry and basic elements and principles of design. Community Colleges only.

Learning Outcomes

1. Demonstrate appropriate skills in configuring and navigating computer systems software applications as appropriate to digital image making needs including organization of files using keywords and running batch processes.
2. Exhibit an understanding of a layer based bitmap editing program, through photo retouching, precise use of selection tools, and color adjustment techniques.
3. Create imagery using a vector based illustration program which demonstrates an understanding of vector based drawing tools.
4. Integrate the use of bitmap and vector images using bitmap and vector based image making applications to demonstrate a basic understanding of composition, color, and appropriate image size and resolution.

ARTS 1610. Drawing I**3 Credits (2+4P)**

This course introduces the basic principles, materials, and skills of observational drawing. Emphasis is placed on rendering a 3-D subject on a 2-D surface with visual accuracy. Other topics include historical and contemporary references as well as an investigation of linear perspective, line, value, shape, space & composition. May be repeated up to 3 credits.

Learning Outcomes

1. Produce drawings that demonstrate techniques and mechanics of observational drawing.
2. Demonstrate competency in the following practices: measuring and sighting, gesture, contour line, negative space, shape, value, space, volume, plane and texture.
3. Create drawings primarily from observation with black and white traditional drawing media.
4. Demonstrate effective verbal or written response to one's own art and the art of others.

ARTS 1630. Painting I**3 Credits (2+4P)**

This course introduces the tradition of painting as a medium for artistic expression. Students will investigate materials, tools, techniques, history and concepts of painting. Emphasis is placed on developing descriptive and perceptual skills, color theory, and composition. May be repeated up to 3 credits.

Prerequisite(s): ARTS 1610.

Learning Outcomes

1. Produce paintings that demonstrate the tradition of methods, techniques, materials, and tools of oil painting.
2. Construct a variety of support structures and grounds on which paintings are created
3. Examine the historical origins and practices of painting from the personal, social and cultural perspective.
4. Identify and apply environmentally safe painting practices, care of tools, equipment, and facilities, as well as disposal of mediums, solvents and paints.
5. Apply basic color theory to representational and non-representational painting.

ARTS 1710. Introduction to Printmaking**3 Credits (2+4P)**

This course provides direct experience of exploring basic printmaking processes, including relief, intaglio, and monoprint processes, as well as the investigation of materials/media, tools, techniques, history, and concepts of printmaking. Emphasis is given to solving problems through thematic development while producing a portfolio of prints.

Learning Outcomes

1. Properly operate a printing press and safely handle materials and equipment.
2. Demonstrate an adequate ability to utilize basic historical printmaking techniques that are widely relevant to contemporary, artistic expressions.
3. Utilize formal elements of art and design (line, shape, value, texture, space, and color), to create prints that are formally sophisticated.
4. Create imagery that contains conceptual depth, which can be interpreted by viewers with regard to social, cultural, political, geographical, and/or psychological experiences and relevance.

ARTS 1711. Computer-Based Illustration**3 Credits (2+4P)**

Introduction to the principles of computerized drawing and design. Using the basic concepts, drawing tools, and vocabulary of Adobe Illustrator.

Prerequisite: ARTS 1610, ARTS 1240, or consent of instructor.

Learning Outcomes

1. Demonstrate drawing with the pen tool.
2. Demonstrate the use of blending color and creating shapes.
3. Create spot colors and effectively use them in a page layout.
4. Demonstrate formatting and creating typography.
5. Demonstrate the use of layers, effects, graphic styles, symbols, and brushes
6. Demonstrate competency in creating digital graphics using of Adobe Illustrator software

ARTS 1712. Digital Graphics**3 Credits (2+4P)**

Importing and exporting images and text into various desktop publishing formats. Exploring imaging, drawing, and page layout applications.

Introduction to typography.

Prerequisite: ARTS 1520.

Learning Outcomes

1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 1713. Web Page Design**3 Credits (2+4P)**

Introduction to the creation of well-designed and organized Web sites. Emphasis on building creative but functional user-friendly sites. Introduction to HTML, Flash, Java Script, and Web-authoring software. Community Colleges only.

Prerequisite: ARTS 1520.

Learning Outcomes

1. Outline the structure and functionality of a typical website.
2. Demonstrate design and layout skills.
3. Demonstrate competency in the use of Dreamweaver software.
4. Demonstrate competency in the use of photo editing software.
5. Demonstrate skills learned for website functionality.
6. Create an Internet compatible website.

ARTS 1810. Jewelry and Small Metal Construction I**3 Credits (2+4P)**

This course introduces the basic techniques, materials, and tools traditionally used in the creation of jewelry and/or small-scale sculptural objects.

Learning Outcomes

1. Apply basic jewelry fabrication techniques (such as: piercing, cold connections, soldering, metal forming, casting and stone setting) to complete projects.
2. Create design sketches of the objects prior to fabrication.
3. Demonstrate knowledge of materials and safe practices for making jewelry, as well as small functional and non-traditional objects.
4. Analyze projects through critiques, oral presentations, and discussions.

ARTS 2010. Portfolio Development**3 Credits (2+4P)**

This course presents the practicalities of building an art career with emphasis on developing a professional portfolio through visual aids, resumes, statements, and presentations. It covers professional practices of the studio artist including self-promotion, contracts, research tools for exhibition venues and other art related opportunities.

Prerequisites: ARTS 1712, ARTS 2611, and ARTS 1520, or consent of instructor.

Learning Outcomes

1. Develop a portfolio package with visual aids, photographic documentation, resumes, bios and artist statements.
2. Analyze the qualifications, procedures and portfolio requirements necessary for professional art related opportunities.
3. Complete an oral presentation on a series of personal works.
4. Distinguish pathways for navigating the business side of being a professional artist.

ARTS 2355. Stained Glass**3 Credits (2+4P)**

Instruction in the fundamental fabrication and design techniques for stained glass. Introduction to visual decision making skills, historical, and critical issues of the medium. Community Colleges only.

Learning Outcomes

1. Demonstrate an understanding of the theory, principles and procedures that comprise the art and science of designing at least four (40 stained glass techniques through both written and verbal assessments, as well as, actual completed examples of each technique.
2. Properly select and safely employ various glass studio tools, instruments, procedures, methods and techniques in the fabrication processes of stained glass.
3. Select and apply suitable problem-solving strategies in a practical studio environment.
4. Work cooperatively in a studio classroom.
5. Relate historical background and significant developments of glass in general and stained glass in particular.
6. Understand the chemical processes associated with various processes used in working with and manipulating glass.
7. Develop critical thinking and problem solving strategies in various stained glass fabrication technics.
8. Be able to critically analyze, assess and appreciate the value of glass works of every kind.

ARTS 2410. Black & White Photography**3 Credits (2+2P)**

This course introduces the fundamental techniques of black and white photography, which includes camera functions and use, exposure techniques and film processing, traditional darkroom printing, and presentation of work. Same as ARTS 1410.

Learning Outcomes

1. Demonstrate competent film development and photographic printing skills
2. Demonstrate an emerging understanding of aesthetic, compositional, conceptual, and communicative tools in photography including lighting and dynamic composition techniques.
3. Be able to critically analyze and discuss photographic images using photographic terminology
4. Demonstrate proper image adjustment and correction techniques, and apply proper exposure techniques

ARTS 2430. Photographic Portraiture**3 Credits (2+2P)**

This course covers the study of professional photography that involves people, including studio and environmental portraits. Topics include studio and exterior lighting techniques, and selecting lighting equipment and supplies. Restricted to: Community Colleges only.

Prerequisite(s): ARTS 1410 or FDMA 1545.

Learning Outcomes

1. Demonstrate successful operation of studio lighting equipment and accurately define lighting equipment terminology
2. Illustrate the principles of photographic lighting
3. Demonstrate and apply how to use and modify natural light effectively
4. Demonstrate understanding of different approaches such as formal, informal, candid, vernacular and their cultural implications
5. Distinguish historic and contemporary cultural notions informing different types of portraits

ARTS 2431. Introduction to Graphic Design**3 Credits (2+4P)**

Introduction to the principles of visual communication and digital media, letterforms, typography and identity marks. Projects produced using conventional and digital tools.

Learning Outcomes

1. Demonstrate working knowledge of the graphic design software.
2. Identify and apply basic design concepts for the purpose of visual communication.
3. Conduct visual research and create presentations on design topics.
4. Solve graphic design problems through solving fundamental communication challenges by sketching, drawing, typographic composition, use of image and color.

ARTS 2440. Photo Finishing & Presentation**2 Credits (1+2P)**

Use of visual language for personal expression. Freelance photography; care of original photos; preparation of portfolios, photographic markets, exhibitions and judging, galleries and copyrights. Students will prepare a photographic portfolio. Restricted to: Community Colleges only.

Prerequisite(s): FDMA 1545.

Learning Outcomes

1. Define your target market and create a complete "Personal Promotional Package"
2. Produce a professional Resume Cover Letter.
3. Produce a professional looking Business Card, Letterhead Mailing Labels
4. Produce a single page Promotional Piece, (and possible follow-up material)
5. Produce a PDF Formatted Portfolio (Create in Photoshop Export as PDF)
6. Produce a clean, professional looking traditional hard portfolio with 20-30 pieces
7. Present the Entire Promotional Portfolio and promo materials in a "Job Interview"

ARTS 2610. Drawing II**3 Credits (2+4P)**

This course introduces color and colored media as an element of composition while emphasizing descriptive and perceptual drawing skills and conceptual approaches to contemporary drawing. Restricted to ART and ANVE/DFM majors.

Prerequisite(s): ARTS 1610.

Learning Outcomes

1. Create drawings in wet and dry color media.
2. Practice analyzing and visually translating observed subjects from realistic, referential, and/or objective form, to non-representational or abstract imagery in drawings.
3. Compose fully developed drawings that include a conceptual or historical basis.
4. Engage in effective written and oral critique in response to one's own art and the art of others.

ARTS 2611. Advanced Computer-Base Illustration**3 Credits (2+4P)**

Design custom graphics and create special effects with filtering, special effects on type, graphing, technical illustrations, and three-dimensional drawing using Adobe Illustrator.

Prerequisites: ARTS 1212, ARTS 1711, and ARTS 1520, or consent of instructor.

Learning Outcomes

1. Demonstrate competency in the use of Adobe Illustrator software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 2616. Aspects of Drawing**2-3 Credits**

Continued work in drawing with emphasis on personal creative endeavor. Community Colleges only.

Prerequisites: ARTS 1610 and ARTS 2610.

Learning Outcomes

1. Advanced skill level in the visual dynamics of line involved in the creation of drawing.
2. Advanced skill level in the visual dynamics of shape involved in the creation of drawing.
3. Advanced skill level in the visual dynamics of value involved in the creation of drawing.
4. Advanced skill level in the visual dynamics of color involved in the creation of drawing.
5. Advanced skill level in the visual dynamics in the combination of line, shape, value and color involved in the creation of drawing.

ARTS 2630. Painting II**3 Credits (2+4P)**

This course focuses on the expressive and conceptual aspects of painting, building on the observational, compositional, technical, and critical skills gained previously. Students will investigate a variety of approaches to subject matter, materials, and creative processes through in-class projects, related out-of-class assignments, library research or museum/gallery attendance, written responses, and critiques. **Prerequisite(s):** ARTS 1610 and ARTS 1630

Learning Outcomes

1. Produce paintings building on the skills and techniques learned in Painting I
2. Solve unique format, support, ground, over and under texturing surface challenges
3. Practice analyzing and translating observed subjects from realistic, referential, and/or objective form, to non-representational imagery
4. Create paintings that explore personal content, stylization, symbolism, narrative, and/or iconography

ARTS 2635. Painting III**2-3 Credits**

Continuation of ARTS 2630.

Prerequisites: ARTS 1610, ART 1240 (for art majors), ART 1630, or consent of instructor.

Learning Outcomes

1. Color mixing and color relationships
2. Create illusions of space and volume
3. The student will strengthen his or her own personal artistic style.
4. Knowledge of the proper use and maintenance of painting tools
5. Explore and learn the technique of a master painter of the past.
6. Awareness of nature, "eye hand response," and an imaginative or personal use of the medium.
7. Awareness of the creative process, exploring unforeseen possibilities
8. An ability to work independently.
9. Understanding of painting styles and arts vocabulary

ARTS 2839. Introduction to Sculpture**3 Credits (2+4P)**

Beginning sculpture students "explore space" while learning new processes and skills, including mold making, welding and woodworking.

Learning Outcomes

1. Be able to utilize a variety of traditional materials and sculpture processes, including: mold making, metal fabrication/wood fabrication, and the creative integration of mixed media.
2. You will learn to differentiate between objects and installations, and be prepared to explore sculpture in upper division, topics based courses.

ARTS 2993. Art Workshop**0.5 Credits (.5)**

Required for all freshman and sophomore Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 308. Restricted to: BA Studio Art, BA Art History BFA Studio Art, BFA Museum Conservation majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Varies

ARTS 2996. Special Topics in Studio**1-3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

ARTS 308. Art Workshop**0.5 Credits (.5)**

Required for all junior and senior Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 208. Restricted to: BA studio art, BA Art History BFA studio art, BFA Museum Conservation majors.

ARTS 340. Internship in Art**1-9 Credits (3P)**

This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 350. Special Topics in Intermediate Drawing and Painting**3 Credits (2+4P)**

Intermediate drawing and painting course focusing on the following topics: Realism, Color, Narrative, and Abstraction. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

Prerequisite(s): ARTS 1610 and ARTS 1630, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to drawing and painting.

ARTS 355. Special Topics in Intermediate Graphic Design**3 Credits (2+4P)**

Intermediate graphic design course focusing on the following topics: web design, typography, motion graphics, publication design. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

Prerequisite(s): ARTS 2431 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 360. The Figure**3 Credits (2+4P)**

Introduction to working from live models, anatomical skeletons, source images and the imagination in a variety of two-dimensional media, including painting and drawing. An emphasis is placed on anatomical accuracy and with a focus on the figure as an expressive subject. May be repeated up to 6 credits.

Prerequisite(s): ARTS 1610 or consent of instructor.

ARTS 365. Intermediate Sculpture Special Topics**3 Credits (2+4P)**

Intermediate sculpture students will expand their fabrication skills in metal, wood and mixed media. Assignments incorporate topics such as Pop art, Process Art, and The Body in Contemporary Art. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 6 credits.

Prerequisite(s): ARTS 2839 or consent of instructor.

ARTS 370. Special Topics in Intermediate Digital Photography
3 Credits (2+4P)

Intermediate digital photography course addressing techniques and production of photo media within the context of contemporary art. Course focuses on the following rotating special topics: Networks, Photo-book and Video art. May be repeated up to 12 credits.

Prerequisite(s): ARTS 1410, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.

ARTS 373. Intermediate Analog Photography
3 Credits (2+4P)

Introduction to skills and techniques of black and white film photography within the context of contemporary art. Emphasis on analog camera work and darkroom procedures. 35 mm SLR or rangefinder film camera required for course. May be repeated up to 6 credits.

Prerequisite(s): ARTS 1410, or consent of instructor.

ARTS 374. Intermediate Ceramics Multiples (Design and Production)
3 Credits (2+4P)

Intermediate ceramics course focusing on an introduction to the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. May be repeated up to 3 credits.

Prerequisite(s): ARTS 1310 or consent of instructor.

Learning Outcomes

1. Develop the basic visual and tactile problem solving skills necessary to making one part and two part molds.
2. Demonstrate competency is using these techniques to translate basic cylindrical, spherical, and rectangular forms.
3. Develop ability to make successful clay casts from properly made molds.
4. Apply the principles of design to creating multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Apply the visual element to glazing and surface design of ceramic forms: Line, Shape, Mass, Value, Color, Texture, Pattern, Space
7. Through research, writing, and class critiques develop the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art.

ARTS 375. Intermediate Ceramics Sculptural Concerns
3 Credits (2+4P)

Intermediate ceramics course focusing on the refinement of technical skills with an emphasis on conceptual development related to materiality.

Prerequisite(s): ARTS 1310 or consent of instructor.

Learning Outcomes

1. Refine and master the basic skills in all the standard ceramic building techniques. This includes wheel throwing, coil building, and slab building.
2. Demonstrate competency is using these techniques to replicate complex geometric, organic, and figurative forms
3. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural forms.
4. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural form.
5. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
6. Demonstrate clear understanding of the visual element to glazing and surface design: Line, Shape, Mass, Value, Color, Texture, Pattern, Space
7. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent and nuanced way.

ARTS 376. Museum/Gallery Research Internship
1-9 Credits

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTS 385. Special Topics in Intermediate Metals/Jewelry
3 Credits (2+4P)

Intermediate Metals/Jewelry course focusing on the following topics: design and production, materiality and sculptural concern. Techniques may include casting, complex construction, forming, and mix media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

Prerequisite(s): ARTS 1810 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level metals/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metals/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.

ARTS 394. Special Topics in Studio
3 Credits (3)

Specific subjects and credits to be announced in the Schedule of Classes online. Topics cannot be repeated. May be repeated up to 9 credits.

ARTS 401. Museum Conservation Techniques I**3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process.

Learning Outcomes

1. Identify and explain strengths and weaknesses of the theory of conservation
2. Analyze a ceramic object through testing and observation; evaluate the results of an object to be conserved.
3. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
4. Apply conservation and restoration techniques to the ceramic object in the lab, after analyzing, evaluating and creating a treatment plan for the object.
5. Create a Condition Report of the ceramic object by describing the condition and its treatment during the conservation process.

ARTS 402. Museum Conservation Techniques II**3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation.

Prerequisite(s): ARTS 401.

Learning Outcomes

1. Analyze different types of materials by examining two objects, a painted canvas and a painted wood panel, through testing and observation and evaluate the results of the objects to be conserved
2. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
3. Apply conservation and restoration techniques to both objects in the lab, a painted canvas and a painted wood panel, after analyzing, evaluating and creating a treatment plan for the object.
4. Create a Condition Report for each object, describing the condition of the object, history, the problems the object presents, its treatment during the conservation process, and any remaining issues after treatment.

ARTS 403. Preventative Conservation/Collections Care**3 Credits (3)**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation.

Learning Outcomes

1. Understand the principles of Preventive Conservation and Collections Care and develop conservation skills through recognizing, describing, explaining, locating, and reporting symptoms and causes of the agents of deterioration that affect all types of art objects
2. Apply methods of Preventive Conservation and collections care for causes of deterioration in museum collections
3. Analyze and Evaluate several museums and create a Museum Assessment that could serve a plan of action to remediate any problems encountered.
4. Create a plan for re-organizing a museum based on the Museum Assessment
5. Create a binder based on the readings from class that includes all the causes of deterioration of materials, how to prevent deterioration, and environmental control of collections.

ARTS 404. Applied Projects in Museum Conservation**3 Credits (3)**

This course provides student with the practical application of techniques and policies learned in previous museum conservation coursework with the underpinnings of basic museum and conservation practices, particularly in collection care, preventive conservation, conservation, ethics, teamwork and security. Rotating special projects. May be repeated up to 6 credits.

Prerequisite(s): ARTS 401, ARTS 402, ARTS 403 or ARTS 501, ARTS 502, ARTS 503.

Learning Outcomes

1. Analyze and examine the different types of materials that compose one or various objects through testing and observation and evaluate the results of the object/s to be conserved
2. Create and defend the conservation treatment plan based on conservation theory and the principles of conservation for cultural objects, the tests results, and the observations.
3. Apply conservation and restoration techniques to the object/s in the lab after analyzing, evaluating and creating a treatment plan for the object/s.
4. Create Condition Reports, one for each object, by describing the condition of the object and its treatment during the conservation process.

ARTS 440. Internship in Art**1-9 Credits (3P)**

This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 450. Special Topics In Advanced Drawing and Painting
3-6 Credits (2-4+4P)

Advanced drawing and painting course focusing on the following topics: Identity, Place, Spirituality, and Body. Topics will be announced in the course schedule. May be repeated up to 12 credits.

Prerequisite(s): 6 credits of ARTS 350, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting

ARTS 455. Special Topics in Advanced Graphic Design
3 Credits (2+4P)

Advanced graphic design course focusing on the following special topics: special projects, identity design, storytelling, portfolio. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 15 credits.

Prerequisite(s): 6 credits of ARTS 355, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 465. Advanced Sculpture Special Topics
3-6 Credits (2-4+4P)

Thematic classes deepen students' knowledge of contemporary sculpture and extended media through a series of interpretive assignments that culminates in a unified body of work. Course topics include: "Artists' Maps", Installation Art/Land Art", "Sculpture and the 1960s", "Sculpture and the 1970's". Topics will be announced in the course schedule. May be repeated up to 18 credits.

Prerequisite(s): ARTS 365 or permission of the instructor.

ARTS 470. Advanced Digital Photography
3 Credits (2+4P)

Advanced digital photography course addressing technique and production of photo media within the context of contemporary art. Course focuses on the following rotating topics: Temporality, Photo-installation and Video Art. Each topic may only be taken once.

Prerequisite: ARTS 370 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced digital photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in digital photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography

ARTS 474. Advanced Ceramics Design and Production
3-6 Credits (3-6)

Advanced ceramics course focusing on the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. Discussions may also include issues of professional practice, marketing, and branding. May be repeated up to 6 credits.

Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.

Learning Outcomes

1. Refine the basic visual and tactile problem solving skills necessary to making two part molds, and develop the ability to make complex multipart molds.
2. Demonstrate competency is using these techniques to translate complex geometric and organic forms
3. Develop pertinent conceptual reasoning for creating multiples of a form in ceramic material.
4. Demonstrate clear understanding of the principles of design in designing ceramic multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Demonstrate clear understanding of the visual element of art to the glaze and surface design of ceramic multiples: Line, Shape, Mass, Value, Color, Texture, Pattern, Space,
7. Through research, writing, and class critiques refine the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art and articulate.

ARTS 475. Advanced Ceramics Sculptural Concerns**3-6 Credits (2-4+4P)**

Advanced ceramics course focusing on conceptual development as it relates the creation of a unified body of work. Topics may include discussions of advanced techniques, professional practices, and contemporary issues in ceramics. May be repeated up to 15 credits.

Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.

Learning Outcomes

1. Strive to innovate the standard ceramic building techniques in a way that contributes to, and is informed by, the field of ceramic sculpture.
2. Develop a cohesive body of work, which explores completely original concepts and themes.
3. Demonstrate clear understand of the principles of design by challenging them in an informed way.
4. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
5. Demonstrate clear understanding of the visual element of art by challenging them in an informed way.
6. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent, nuanced, and critical way. Begin to measure one's work against the larger context of contemporary art.

ARTS 485. Special Topics in Advanced Metals/Jewelry**3-6 Credits (2-4+4P)**

Advanced Metals/Jewelry course focusing on the following topics: conceptual development and personal aesthetic and style, professional practices, contemporary issues in Metals/Jewelry, and senior exhibition. Techniques may include enameling, coloring, historical processes, and digital technology. Topics will be announced in the course schedule. Each topic may only be taken once.

Prerequisite: 6 credits of ARTS 385, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level metal/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metal/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.

ARTS 490. Museum Conservation Internship**1-6 Credits (1-6)**

The goal of this internship is to provide a student with a practical learning experience in preventative conservation techniques and policies so that they can relate what they have learned in the classroom from ART 403 Preventative Conservation/Collections Care to applied situations. It will provide the student an opportunity to learn skills and knowledge needing in working with museum collections. Tasks and projects will be assigned by the instructor. 3 credits required for BFA in Museum Conservation. May be repeated up to 6 credits.

Prerequisite(s): ARTS 403.

ARTS 494. Special Topics in Studio**3 Credits (3)**

Specific subjects and credits to be announced in the Schedule of Classes online. May be repeated up to 9 credits.

ARTS 495. Undergraduate Studio Thesis**3-6 Credits (3-6)**

Special research and independent study leading to undergraduate thesis exhibition. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

ARTS 496. Fundamentals of Studio Management**1 Credit (1)**

Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.

Prerequisite: consent of instructor.

ARTS 499. Problems in Studio Art**1-6 Credits (1-6)**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 9 credits. Consent of Instructor required.

ARTS 501. Museum Conservation Techniques I**3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. May be repeated up to 3 credits. Crosslisted with: ARTS 401.

ARTS 502. Museum Conservation Techniques II**3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ARTS 402.

Prerequisite(s): ARTS 501.

ARTS 503. Preventive Conservation/Collections Care**3 Credits (3)**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ARTS 403.

ARTS 504. Applied Projects in Museum Conservation
3 Credits (3)

This course provides students with the practical application of techniques and policies learned in previous conservation coursework with the underpinnings of basic museum and conservations practices, particularly in collection care, preventative conservation, conservation, ethics, teamwork and security. May be repeated up to 6 credits. Crosslisted with: ARTS 404.

Prerequisite(s): ARTS 401, ARTS 402, ARTS 403 OR ARTS 501, ARTS 502, ARTS 503.

ARTS 540. Internship in Art
1-9 Credits (3P)

This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits. Crosslisted with: ARTS 440 and ARTS 340.

ARTS 550. Drawing and Painting Workshop
3-6 Credits (2-4+4P)

Graduate level drawing and painting course focusing on the development of concepts, expression and visual form. May be repeated up to 27 credits.

Prerequisite(s): Graduate standing.

ARTS 555. Graphic Design
3 Credits (3)

May be repeated up to 27 credits.

ARTS 565. Sculpture Media
3-9 Credits

May be repeated up to 27 credits.

ARTS 570. Photography Seminar
3-9 Credits (3-9)

Graduate students develop and implement a research program using photographic media and processes. Outcomes and program developed in consultation with photography faculty.

Prerequisite: .

Learning Outcomes

1. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography at the graduate level.

ARTS 575. Ceramic Arts
3-9 Credits

May be repeated up to 27 credits.

ARTS 576. Museum/Gallery Research Internship
1-9 Credits

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. May be repeated for a maximum of 9 credits.

Prerequisite: graduate standing.

ARTS 585. Metals and Jewelry Design
3-9 Credits

May be repeated up to 27 credits.

ARTS 595. Problems in Studio
1-6 Credits

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 12 credits. Consent of Instructor required.

ARTS 596. Graduate Studio Seminar
3 Credits (3)

Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form. May be repeated for a maximum of 18 credits. Restricted to majors.

Prerequisite(s): Graduate standing.

ARTS 598. Studio Thesis
1-15 Credits

Special research in studio, leading to an exhibition and written thesis statement.

Name: Dr. Margaret Goehring, Department Head

Office Location: Devasthali Hall, Room 118

Mailing Address: 1308 University Avenue, Room 118A, P.O. Box 30001, MSC 3572, Las Cruces, NM 88003-8001

Phone: (575) 646-1705

Website: <http://artdepartment.nmsu.edu/> (<http://artdepartment.nmsu.edu>)

University Art Museum Website: <https://uam.nmsu.edu>

Art (Art History) - Bachelor of Arts

The art history program is designed to give the student a broad familiarity with the visual arts through the factual and theoretical study of aesthetics, cultural contexts, iconography, stylistic development and technical practices. Students explore a range of methodologies and theoretical lenses through which to study objects and images. Art history coursework opens up broader questions about structures of race, class, sexuality, gender, identity and power as it relates to art, with a particular emphasis on the unique lens of the border region in which we are located. Art history is fundamentally interdisciplinary, therefore, students should take related courses in anthropology, history, languages and literature, music history, philosophy, religion, and theatre history. Students are strongly encouraged to study at least one other language to prepare them for advanced research in the discipline, as the study of art is especially dependent on written sources in other languages. A degree in art history is excellent preparation for a range of careers, including in museum and galleries, education, travel and tourism, auction houses and estate sales, art and copyright law, equity analysis and public relations, arts correspondence and journalism, appraisal, libraries and archives, and more.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10

<i>English Composition - Level 1</i> ¹	
<i>English Composition - Level 2</i> ¹	
<i>Oral Communication</i> ¹	
<i>Area II: Mathematics</i> ²	3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>	
10-11	
Area III: Laboratory Sciences Course (4 credits) ¹	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹	
<i>Area V: Humanities</i> ¹	3
<i>Area VI: Creative and Fine Arts</i>	
ARTH 2110G History of Art I	3
<i>General Education Elective</i>	
ARTH 2120G History of Art II	3
Viewing a Wider World ³	6
Departmental/College Requirements	
Both ART 2110G and ART 2120G count towards Area VI and the General Education elective and Departmental/College Requirements	
ARTS 1121 Foundations in Art	3
ARTH 2136 Writing in Art	3
ARTH 479 Methodologies and Theories of Art and Art History	3
Choose one introductory ARTS course ⁴	3
Choose two 300-level art history courses ⁴	6
Choose two 400-level art history courses ⁴	6
Choose 9 credits of 300/400-level ARTH courses ⁴	9
Choose 9 credits of ARTS or ARTH electives	9
Electives, to bring the total credits to 120 ⁵	38-40
While 6 credits can be either ARTS at any level or ARTH at upper-division level, 3 credits must be Upper-Division level ARTS/ARTH	
Total Credits	120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Please see the Courses (p. 459) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
ARTH 2136	Writing in Art	3
ARTH 2110G	History of Art I	3
ARTS 1121	Foundations in Art	3
Area III: Laboratory Science Course ¹		4
Area II: Mathematics Course (C- or better) ¹		3-4
Area IV: Social/Behavioral Sciences Course ¹		3
Elective Courses		7

Credits 30-31

Sophomore		
ARTH 2120G	History of Art II	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ARTS Course (1000-2000 level) Course (C- or better) ³		3
ARTH Course (300-level) (C- or better) ³		3
ARTH Course (300-level) (C- or better) ³		3
Either a ARTS Course (2000/400-level) or an ARTH Course (300/400-level) (C- or better in either) ³		3
Elective Courses(s)		9

Credits 30

Junior		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course ¹		3-4
ARTH Course (300/400-level) (C- or better) ³		3
Either an ARTS Course (any level) or an ARTH course (300/400-level) (C- or better) ³		3
Area V: Humanities Course ¹		3
Viewing a Wider World ⁴		3
ARTH Course (300/400-level) (C- or better) ³		3
ARTH Course (300/400-level) (C- or better) ³		3
Elective Course(s)		9

Credits 30-31

Senior		
Viewing a Wider World ⁴		3
ARTH Course (400-level) (C- or better) ³		3
ARTH 479	Methodologies and Theories of Art and Art History (C- or better)	3
Upper-Division ARTS/ARTH Elective Course (C- or better in either) ³		3
ARTH Course (400-level) (C- or better) ³		3
Elective Course(s)		15

Credits 30

Total Credits 120-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Students must complete a Second Language requirement, see the Requirements (p. 474) tab for more information about the ways to complete this.

³ Please see the Courses (p. 459) tab of the Art Department page within this catalog to determine which courses are Studio Arts (ARTS) and which are Art History (ARTH).

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Art (Studio Art) - Bachelor of Arts

The Bachelor of Arts is designed to give the student a broad interdisciplinary understanding of the areas of painting/drawing, graphic design, printmaking, sculpture, photography, ceramics, conservation, jewelry and metalsmithing, through a series of introductory and special topics courses and the history and appreciation of art in the context of a liberal education. Students are required to take 30 credits of upper-level studio art classes and 18 credits of Art History.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ²		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i>		
ARTH 2110G	History of Art I	3
<i>General Education Elective</i>		
ARTH 2120G	History of Art II	3
Viewing a Wider World ³		6
Departmental/College Requirements		
Both ART 2110G and ART 2120G count towards Area VI and the General Education elective and Departmental/College Requirements		
ARTS 1121	Foundations in Art	3
ARTH 2136	Writing in Art	3
Choose five or six Introductory Studio Art Courses from the following:		15
ARTS 1310	Introduction to Ceramics	
ARTS 1410	Introduction to Photography	
ARTS 1610	Drawing I	
ARTS 1710	Introduction to Printmaking	
ARTS 1810	Jewelry and Small Metal Construction I	
ARTS 1630	Painting I	
ARTS 2431	Introduction to Graphic Design	
ARTS 2839	Introduction to Sculpture	
Choose 18 credits of 300-level ARTS courses		18
Choose one 300-level ARTH course		3
Choose two 300-400 ARTH courses		6

Choose 12 credits of 400-level ARTS courses	12
Choose one Upper-Division ARTS or ARTH elective	3
Second Language: (not required)	
Electives, to bring the total credits to 120 ⁴	17-19
Total Credits	120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- with a concentration in Studio Art there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
ARTH 2136	Writing in Art (C- or better)	3
Introductory ARTS Course (C- or better) ¹		3
ARTS 1121	Foundations in Art (C- or better)	3
Elective Course or FYEX 1112		2-3
<i>Area II: Mathematics Course</i> ²		3-4
<i>Area IV: Social/Behavioral Sciences Course</i> ²		3
ARTH 2110G	History of Art I (C- or better)	3
Introductory ARTS Course (C- or better) ¹		3
Introductory ARTS Course (C- or better) ¹		3
Credits		30-32

Sophomore		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Choose from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2120G	History of Art II (C- or better)	3
Introductory ARTS Course (C- or better) ¹		3
Introductory ARTS Course (C- or better) ¹		3

Area III: Laboratory Science Course ²	4
ARTS Course (300-level) (C- or better) ³	3
ARTS Course (300-level) (C- or better) ³	3
ARTH Course (300-level) (C- or better) ³	3
Elective Course	2
Credits	30
Junior	
Area V: Humanities Course ²	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course ¹	3-4
ARTS Course (300-level) (C- or better) ³	3
ARTS Course (300-level) (C- or better) ³	3
ARTH Course (300/400-level) (C- or better) ³	3
ARTS Course (300-level) (C- or better) ³	3
ARTS Course (300-level) (C- or better) ³	3
Elective Courses	9
Credits	30-31
Senior	
Viewing a Wider World Course ⁴	3
Viewing a Wider World Course ⁴	3
ARTS Course (400-level) (C- or better) ³	3
ARTS Course (400-level) (C- or better) ³	3
ARTS Course (400-level) (C- or better) ³	3
ARTS Course (400-level) (C- or better) ³	3
ARTS Course (400-level) (C- or better) ³	3
Elective Course - Upper Division ⁵	4
Elective Courses	5
Credits	30
Total Credits	120-123

¹ **Introductory ARTS Courses:** Certain ARTS 100-level courses, in addition to the ones below, may count but only apply for Transfer Students.

- ARTS 1310 Introduction to Ceramics
- ARTS 1410 Introduction to Photography
- ARTS 1610 Drawing I
- ARTS 1630 Painting I
- ARTS 1710 Introduction to Printmaking
- ARTS 1810 Jewelry and Small Metal Construction I
- ARTS 2431 Introduction to Graphic Design
- ARTS 2839 Introduction to Sculpture

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Please see the Courses (p. 459) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Students can take one 4 credit Upper-Division Elective or can take one 3 credit Upper-Division and a 1 credit Elective to fulfill the requirement.

Art (Museum Conservation) - Bachelor of Fine Arts

Art Conservation is the study of the preservation and restoration of art as well as of other cultural and natural objects. The B.F.A. degree with an concentration in Museum Conservation provides an academic

structure within which students master specific sets of practical skills while developing broad professional and theoretical perspectives toward the issue of conserving objects in a museum or collection setting. By combining theory with practice, the program offers students the interpretive, quantitative and administrative skills needed for careers as conservators, curators, registrars, collections managers, exhibit designers and museum administrators, all of whom must have specialized training in the care and handling of works of art to be successful.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social Behavioral Science Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i>		
ARTH 2110G	History of Art I	3
<i>General Education Elective</i>		
ARTH 2120G	History of Art II	3
Viewing A Wider World ³		6
Departmental/College Requirements		
Both ARTH 2110G and ARTH 2120G count towards Area VI and the General Education elective and Departmental/College Requirements		
Both CHEM 1215G and CHEM 1225G count towards Area III and Area III-IV General Education elective and Department/College Requirements		
<i>Science</i>		
Select Option A or Option B:		16
<i>Option A</i> ⁴		
CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	
Choose one sequence from the following for eight credits:		8
CHEM 315	Organic Chemistry Laboratory	
CHEM 1215G & CHEM 1225G	General Chemistry I Lecture and Laboratory for STEM Majors and General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 1216 & CHEM 1226	General Chemistry I Lecture and Laboratory for CHEM Majors and General Chemistry II Lecture and Laboratory for CHEM Majors	
<i>Option B</i> ⁵		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	

CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
or EPWS 303	Economic Entomology	
Art Department requirements		
ARTS 1121	Foundations in Art	3
ARTS 1630	Painting I	3
ARTS 1610	Drawing I	3
ARTH 2136	Writing in Art	3
ARTS 401	Museum Conservation Techniques I	3
ARTS 402	Museum Conservation Techniques II	3
ARTS 403	Preventative Conservation/Collections Care	3
ARTS 490	Museum Conservation Internship	3
Choose three 300-400 ARTH courses		9
Choose two ARTS courses or 300-400 level ARTS course		6
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
History/Anthropology		
ANTH 315	Introduction to Archaeology	3
Select three credits of HIST with the approval of the program advisor.		3
Select nine credits of ANTH with the approval of the program advisor.		9
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 ⁷		2-4
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section for a full list of courses

⁴ Recommended for students planning to attend graduate school in art conservation.

⁵ Recommended for students who do NOT plan to attend graduate school in art conservation.

⁶ Courses are open by permission of the instructor only.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Art with a concentration in Museum Conservation there is no second language requirement for the degree.

A Suggested Plan of Study (Option A)

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course (C- or better) ¹		3-4
Area IV: Social/Behavioral Sciences Course ¹		3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2136	Writing in Art (C- or better)	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C- or better) ²	4
ARTS 1121	Foundations in Art	3
ARTH 2110G	History of Art I (C- or better)	3
Elective Course		1
Credits		30-31
Sophomore		
Area V: Humanities Course ¹		3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C- or better) ²	4
ARTH 2120G	History of Art II (C- or better)	3
ARTS 1610	Drawing I (C- or better) ²	3
ARTS Course (2000 or 300-level) (C- or better) ³		3
CHEM 313	Organic Chemistry I (C- or better) ²	3
ARTS 1630	Painting I ²	3
ARTS Course (200-level) (C- or better) ³		3
ARTH Course (300-level) (C- or better) ³		3
Elective Course		2
Credits		30
Junior		
Viewing a Wider World Course ⁴		3
CHEM 314	Organic Chemistry II (C- or better) ²	3
CHEM 315	Organic Chemistry Laboratory (C- or better)	2
ANTH 315	Introduction to Archaeology (C- or better) ²	3
ARTH Course (300-level) (C- or better) ³		3
ARTS 403	Preventative Conservation/Collections Care (C- or better) ²	3
ARTH Course (300-level) (C- or better) ³		3
Viewing a Wider World Course ⁴		3
Elective Courses		7
Credits		30
Senior		
HIST Elective Course (C- or better) ^{2,5}		3
ANTH Elective Course (C- or better) ^{2,6}		3
ARTS 490	Museum Conservation Internship (C- or better) ²	3
ARTS 401	Museum Conservation Techniques I (C- or better) ²	3
ANTH Elective Course (C- or better) ^{2,6}		3
ANTH Elective Course (C- or better) ^{2,6}		3
ARTS 402	Museum Conservation Techniques II (C- or better) ²	3

Elective Courses	9
Credits	30
Total Credits	120-121

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² For students interested in graduate school in this major, it is highly recommended to obtain a B- or better for all Museum Conservation Requirements

³ Please see the Courses (p. 459) tab of the Art Department page within this catalog to determine which courses are Studio Arts (ARTS) and which are Art History (ARTH).

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Work with your program advisor to select an approved HIST course to meet this requirement.

⁶ Work with your program advisor to select an approved ANTH course to meet this requirement.

A Suggested Plan of Study (Option B)

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I	4
Area II: Mathematics Course (C- or better) ¹		3-4
Area IV: Social/Behavioral Sciences Course ¹		3
Choose one from the following:		3
AXED 2120G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2136	Writing in Art (C- or better)	3
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C- or better) ²	4
ARTS 1121	Foundations in Art	3
ARTH 2110G	History of Art I (C- or better) ¹	3
Elective Course		1
Credits		30-31

Sophomore		Credits
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C- or better) ²	4
ARTS 1610	Drawing I (C- or better) ²	3
ARTS 1630	Painting I (C- or better) ²	3
ARTH 2120G	History of Art II (C- or better)	3
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
ARTS Course (200 or 300-level) (C- or better) ³		3
ARTH Course (300-level) (C- or better) ³		3
Area V: Humanities Course ¹		3

Elective Courses	4
Credits	30

Junior		Credits
Viewing a Wider World Course ⁴		3
ANTH 315	Introduction to Archaeology (C- or better) ²	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (C- or better)	3
ARTS Course (200 or 300-level) (C- or better) ³		3
ARTS 403	Preventative Conservation/Collections Care (C- or better) ²	3
ARTH Course (300-level) (C- or better) ³		6
ARTS 401	Museum Conservation Techniques I (C- or better) ²	3
HIST Elective Course ³		3
Elective Courses		3
Credits		30

Senior		Credits
Viewing a Wider World ⁴		3
ANTH Elective Courses (C- or better) ^{2,6}		9
ARTS 402	Museum Conservation Techniques II (C- or better) ²	3
Elective Course (Upper Division)		3
Elective Courses		12
Credits		30
Total Credits		120-121

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² For students interested in graduate school in this major, it is highly recommended to obtain a B- or better for all Museum Conservation Requirements

³ Please see the Courses (p. 459) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Work with your program advisor to select an approved HIST course to meet this requirement.

⁶ Work with your program advisor to select an approved ANTH course to meet this requirement.

Art (Studio Art) - Bachelor of Fine Arts

The studio art curriculum is designed to give the student a broad, transdisciplinary understanding of the field of visual arts, including appreciation and criticism, art history, ceramics, drawing, graphic design and media arts, jewelry/metalsmithing, painting, photography, printmaking, sculpture and museum conservation. This program is recommended for those students who wish to embark on a professional career in art. The Bachelor of Fine Arts degree is a professional baccalaureate degree, which requires a senior thesis exhibition and capstone class in the final semester of study. Students seeking a BFA must apply in the spring of their sophomore year for acceptance into the BFA program - this is done via a portfolio review.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹		
<i>Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i>		
ARTH 2110G	History of Art I	3
<i>General Education Elective</i>		
ARTH 2120G	History of Art II	3
Viewing A Wider World ³		6
Departmental/College Requirements		
Both ARTH 2110G and ARTH 2120G count towards Area VI and the General Education elective and Departmental/College Requirements		
ARTS 1121	Foundations in Art	3
ARTH 2136	Writing in Art	3
ARTS 495	Undergraduate Studio Thesis	3
<i>Introductory ARTS Courses</i> ⁴		18
Choose 18 credits of 300-level ARTS courses		18
Choose 18 credits of 400-level ARTS courses		18
Choose one 300-level ARTH course		3
Choose 6 credits of 300-400 level ARTH courses		6
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		8-10
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section for a full list of courses

⁴ **Introductory ARTS Courses:** Certain ARTS 1000/2000-level courses, in addition to the ones below, may count but only apply for Transfer Students.

- ARTS 1310 Introduction to Ceramics
- ARTS 1410 Introduction to Photography
- ARTS 1610 Drawing I
- ARTS 1630 Painting I
- ARTS 1710 Introduction to Printmaking
- ARTS 1810 Jewelry and Small Metal Construction I

- ARTS 2431 Introduction to Graphic Design
- ARTS 2839 Introduction to Sculpture

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Art with an emphasis in Studio Art there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G	Composition I (C- or better)	4
ARTH 2136	Writing in Art (C- or better)	3
Introductory Studio Art Course (C- or better) ¹		3
ARTS 1121	Foundations in Art (C- or better)	3
Area V: Humanities Course ²		3
Area II: Mathematics Course ²		3-4
Area IV: Social/Behavioral Sciences Course ²		3
ARTH 2110G	History of Art I (C- or better)	3
Introductory ARTS Course (C- or better) ¹		6
Credits		31-32

Second Year		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2120G	History of Art II (C- or better)	3
Introductory ARTS Course (C- or better) ¹		9
Area III: Laboratory Sciences Courses ²		4
ARTS Course (300-level) (C- or better) ³		6
ARTH Course (300-level) (C- or better) ³		3
Credits		31

Third Year		
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course ²		3-4
ARTS Course (300-level) (C- or better) ³		12
ARTH Course (300/400-level) (C- or better) ³		6
Elective Course ³		3
ARTS Course (400-level) (C- or better) ³		6
Credits		30-31

Fourth Year

Viewing a Wider World Course ⁴	6
ARTS Courses (400-level) (C- or better) ³	12
Elective Course(s)	7
ARTS 495 Undergraduate Studio Thesis	3
Credits	28
Total Credits	120-122

¹ **Introductory ARTS Courses:** Certain ARTS 200-level courses, in addition to the ones below, may count but only apply for Transfer Students.

- ARTS 1310 Introduction to Ceramics
- ARTS 1410 Introduction to Photography
- ARTS 1610 Drawing I
- ARTS 1630 Painting I
- ARTS 1710 Introduction to Printmaking
- ARTS 1810 Jewelry and Small Metal Construction I
- ARTS 2431 Introduction to Graphic Design
- ARTS 2839 Introduction to Sculpture

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Please see the Courses (p. 459) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Art - Undergraduate Minor

The Studio Art minor requires 18 credits. Students earning a BA or BFA in Studio Art cannot get a minor in Studio Art. Students earning a BA in Art History or BFA in Museum Conservation can get a minor in Studio Art by passing at least 6 credits in the minor beyond the requirements of the major.

Prefix	Title	Credits
Required Courses		
Studio art or art history at the 300-400 level		9
Select three from the following:		9
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
ARTS 1310	Introduction to Ceramics	
ARTS 1410	Introduction to Photography	
ARTS 1610	Drawing I	
ARTS 1630	Painting I	
ARTS 1810	Jewelry and Small Metal Construction I	
ARTS 1710	Introduction to Printmaking	
ARTH 2136	Writing in Art	
ARTS 2431	Introduction to Graphic Design	
ARTS 2839	Introduction to Sculpture	
Total Credits		18

Art History - Undergraduate Minor

The Art History minor requires 18 credits. Students earning a BA in Art History cannot get a minor in Art History. Students earning a BA in Studio Art, BFA in Studio Art, or BFA in Museum Conservation can get a

minor in Art History by passing at least 6 credits in the minor beyond the requirements of the major.

Prefix	Title	Credits
Required Courses		
ARTH 2110G	History of Art I	3
ARTH 2120G	History of Art II	3
ARTH 2136	Writing in Art	3
ARTH courses at the 300-499 level		9
Total Credits		18

Museum Conservation - Undergraduate Minor

The Museum Conservation minor requires 18 credits. Students cannot earn both a bachelor's degree in the Department of Art and the Museum Conservation minor unless they pass at least 6 credits in the minor beyond the requirements of the major. An undergraduate minor in Museum conservation requires the completion of 9 credits of the three 400 level museum conservation courses listed below, and 9 credits of the courses selected from one of the three tracks listed below.

Prefix	Title	Credits
Required Courses		
ARTS 401	Museum Conservation Techniques I (Spring)	3
ARTS 402	Museum Conservation Techniques II (Fall)	3
ARTS 403	Preventative Conservation/Collections Care (Directed Readings)	3
Select one from the following tracks:		9
Anthropology		
Art		
History		
Total Credits		18

Track 1: Anthropology

Prefix	Title	Credits
Select 9 credits from the following:		9
ANTH 315	Introduction to Archaeology	
ANTH 345	Introduction to Museology	
ANTH 349	Museum Anthropology	
ANTH 313V	Ancient Mexico	
ANTH 330V	Magic Witchcraft and Religion	
ANTH 464	Curation Crisis in Archaeology	
ANTH 467	Archaeology of the American Southwest	
ANTH 318	Historical Archaeology	
ANTH 378	Introduction to Lab Methods in Archaeology	
Total Credits		9

Track 2: Art

Prefix	Title	Credits
Select 9 credits from the following:		9
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
ARTS 1310	Introduction to Ceramics	
ARTS 1410	Introduction to Photography	
ARTS 1610	Drawing I	
ARTS 1630	Painting I	

ARTS 1710	Introduction to Printmaking	
ARTS 1810	Jewelry and Small Metal Construction I	
ARTH 2136	Writing in Art	
ARTS 2839	Introduction to Sculpture	
Total Credits		9

Track 3: History

Prefix	Title	Credits
Select 9 credits from the following:		9
HIST 334	Art and Life in Renaissance Italy	
HIST 371	Greek Civilization: From Helen of Troy to Alexander the Great	
HIST 397	Introduction to Public History	
HIST 438	Antiquity and Modernity	
HIST 483	Historic Preservation	
HIST 486	Interpreting Historic Places for the Public	
Total Credits		9

Astronomy

Undergraduate Program Information

The department offers an undergraduate astronomy minor degree, which requires 18-20 credits. The department does not offer a BS degree but encourages interested students to enroll in the physics program as a first step toward a career in astronomy. Our 100- and 300-level courses meet various university general education requirements. All students are invited to share with us this exciting area of study, through our basic and advanced undergraduate courses

Prefix	Title	Credits
Course List ¹		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	4
ASTR 1120G	The Planets Lecture & Laboratory	4
ASTR 301V	Revolutionary Ideas in Astronomy	3
ASTR 305V	The Search for Life in the Universe	3
ASTR 308V	Into the Final Frontier	3
ASTR 400	Undergraduate Research	1-3
ASTR 401	Topics in Modern Astrophysics	3
ASTR 402	Astronomical Observations and Techniques	3

¹ Other courses at the 300 and 400-levels are offered on an occasional basis. Consult the "Course Descriptions" section in this catalog.

Graduate Program Information

The Department of Astronomy offers graduate work leading to the Doctor of Philosophy and Master of Science degrees. To be admitted as a regular student to the NMSU Graduate School as a major in astronomy, a student must present a suitable undergraduate background with emphasis (12-16 credits) on junior-senior level physics, and mathematics.

Information on assistantships and fellowships in teaching and research can be obtained from the department.

Each entering graduate student will be assigned a committee that will guide the student in choice of courses, suggest training if needed to remedy deficiencies and determine specific degree requirements in accord with the student's needs and objectives, and in agreement

with departmental policies. The program requires 33 traditional course credit hours (11 classes), 4 seminar class credit hours, plus research in astronomy. Each student must demonstrate no later than during the third year sufficient academic and research ability to qualify for continuation in doctoral studies.

The MS degree in astronomy is closely connected with the astronomy Ph.D. program, and questions concerning requirements should be directed to the department.

Qualifying, Comprehensive and Final examinations are described elsewhere in this catalog. Questions concerning styles of the examinations should be directed to the department head.

The department has access to several different observing facilities. NMSU operates the Apache Point Observatory on behalf of the Astrophysical Research Corporation and the observatory is home to several telescopes:

- the ARC 3.5m telescope,
- a 1m telescope owned by NMSU
- the ARCSAT 0.5m telescope, and
- the Sloan Digital Sky Survey (SDSS) 2.5m telescope.

The Department is a full partner in the SDSS project. The Department also operates the Dunn Solar Telescope and the Visitor Center at the Sunspot Solar Observatory. The Department also operates a 24-inch telescope on Tortugas Mountain, near the NMSU campus.

The department is home to the NASA Planetary Data System Atmosphere Node, where solar system exploration data are archived.

Degrees for the Department

Master Degree(s)

- Astronomy - Master of Science (p. 100)

Doctoral Degree(s)

- Astronomy - Doctor of Philosophy (p. 175)

Minors for the Department

- Astronomy - Undergraduate Minor (p. 486)

Professor, Jason Jackiewicz, Department Head

Professors: Chanover, Churchill, Holtzman, Jackiewicz, McAteer, Murphy;
Associate Professors: Finlator, Lyra, Prescott; **Assistant Professors:** Burchett, Nielsen, Shetye; **College Professors:** Beebe **Observatory Specialist:** Edwards

J. Burchett, Ph.D. (University of Massachusetts) - galaxy clusters, intergalactic medium, cosmic simulations; N. Chanover, Ph.D. (New Mexico State) - planetary astronomy; C. Churchill, Ph.D. (California-Santa Cruz) - galaxies and intergalactic medium; K. Finlator, Ph.D. (University of Arizona) - galaxy evolution, the intergalactic medium, cosmological reionization; J. Holtzman, Ph.D. (California- Santa Cruz) - stars and stellar populations in galaxies; J. Jackiewicz, Ph.D. (Boston College) - solar physics, helioseismology, stellar structure and evolution, planetary interiors; W. Lyra (Uppsala University) - planet formation, habitability; R. T. J. McAteer, Ph.D. (Queen's University, Belfast) - solar physics, Sun-Earth connection; J. Murphy, Ph.D. (U. Washington) - planetary atmospheres and exploration; E. Nielsen, Ph.D. (University of Arizona) - extrasolar planets; M. Prescott, Ph.D. (University of Arizona) - Lyman-

alpha nebulae, kinematics of gas within cosmic web; J. Shetye, Ph.D. (Armagh Observatory) - solar physics

Astronomy Courses

ASTR 1115G. Introduction to Astronomy Lecture & Laboratory **4 Credits (3+2P)**

This course surveys observations, theories, and methods of modern astronomy. The course is predominantly for non-science majors, aiming to provide a conceptual understanding of the universe and the basic physics that governs it. Due to the broad coverage of this course, the specific topics and concepts treated may vary. Commonly presented subjects include the general movements of the sky and history of astronomy, followed by an introduction to basic physics concepts like Newton's and Kepler's laws of motion. The course may also provide modern details and facts about celestial bodies in our solar system, as well as differentiation between them – Terrestrial and Jovian planets, exoplanets, the practical meaning of “dwarf planets”, asteroids, comets, and Kuiper Belt and Trans-Neptunian Objects. Beyond this we may study stars and galaxies, star clusters, nebulae, black holes, and clusters of galaxies. Finally, we may study cosmology—the structure and history of the universe. The lab component of this course includes hands-on exercises that work to reinforce concepts covered in the lecture, and may include additional components that introduce students to the night sky. May be repeated up to 4 credits.

Learning Outcomes

1. Students will discuss the night sky as seen from Earth, including coordinate systems, the apparent daily and yearly motions of the sun, Moon, and stars, and their resulting astronomical phenomena.
2. Students will list and apply the steps of the scientific method.
3. Students will describe the scale of the Solar System, Galaxy, and the Universe.
4. Students will explain telescope design and how telescopes and spectra are used to extract information about Astronomical objects.
5. Students will describe the formation scenarios and properties of solar system objects.
6. Students will describe gravity, electromagnetism, and other physical processes that determine the appearance of the universe and its constituents.
7. Students will describe methods by which planets are discovered around other stars and current results.
8. Students will describe the structure, energy generation, and activity of the sun.
9. Students will compare our sun to other stars and outline the evolution of stars of different masses and its end products, including black holes. 1
10. Students will describe the structure of the Milky Way and other galaxies and galaxy clusters. 1
11. Students will describe the origin, evolution, and expansion of the universe based on the Big Bang Theory and recent Astronomical observations. 1
12. Students will describe conditions for life, its origins, and possible locations in the universe.

ASTR 1116. Introduction to Astronomy Lab, Special **1 Credit (1)**

This lab-only listing exists only for students who may have transferred to NMSU having taken a lecture-only introductory astronomy class, to allow them to complete the lab requirement to fulfill the general education requirement. Consent of Instructor required. , at some other institution). Restricted to Las Cruces campus only.

Prerequisite(s): Must have passed Introduction to Astronomy lecture-only.

Learning Outcomes

1. Course is used to complete lab portion only of ASTR 1115G or ASTR 112
2. Learning outcomes are the same as those for the lab portion of the respective course.

ASTR 1120G. The Planets Lecture & Laboratory **4 Credits (3+2P)**

Comparative study of the planets, moons, comets, and asteroids which comprise the solar system. Emphasis on geological and physical processes which shape the surfaces and atmospheres of the planets. Laboratory exercises include analysis of images returned by spacecraft. Intended for non-science majors, but some basic math required. May be repeated up to 4 credits.

Learning Outcomes

1. Students will describe the sky as seen from Earth, the apparent daily and yearly motions of the Sun, Moon, planets and stars, and resulting astronomical phenomena.
2. Students will apply the process of the scientific method in an astrophysical setting.
3. Students will describe the structure of the solar system and explain the development of the currently accepted model of solar system formation.
4. Students will explain how telescopes and spectra are used to extract information about astronomical objects.
5. Students will describe properties of minor solar system objects, such as dwarf planets, moons, asteroids, meteoroids, and comets.
6. Students will compare and contrast bulk and unique properties of the Terrestrial and Jovian worlds.
7. Students will describe how gravity and other physical processes determine the appearance of the solar system and its constituents.

ASTR 301V. Revolutionary Ideas in Astronomy **3 Credits (3)**

Examines recent fundamental scientific revolutions that have shaped our view of Earth and the universe. Topics in astronomy range from exoplanets to black holes to dark energy and raise questions about the very nature of how we use the scientific method to see the unseen, and how this shapes science research today.

Prerequisite(s): Any general education science course.

ASTR 305V. The Search for Life in the Universe **3 Credits (3)**

Use of information from several of the sciences to explore the likelihood that life exists elsewhere in the universe. Subjects include an overview of historical ideas about the possibility of life elsewhere in the universe, the chemistry and biology of life on Earth, recent explorations for life within our solar system, and current search strategies for life in the universe and their scientific basis.

ASTR 308V. Into the Final Frontier**3 Credits (3)**

Exploration of space: a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. Same as HNRS 308V.

ASTR 400. Undergraduate Research**1-3 Credits**

Supervised individual study or research. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

ASTR 401. Topics in Modern Astrophysics**3 Credits (3)**

This course is designed for students interested in astrophysics who have some background in math and physics and want to learn about basic astrophysics and interesting current topics. The course will cover basic astrophysical concepts such as orbital mechanics, light, and radiative processes and transfer. These concepts will be applied to the discussion of exciting modern topics involving planets, exoplanets, stars, galaxies, and/or cosmology, with topical emphasis determined by the instructor.

Prerequisite(s): MATH 1521G and (PHYS 2110 or PHYS 1310G).

ASTR 402. Astronomical Observations and Techniques**3 Credits (3)**

Designed for students interested in astrophysics who have some background in math and astronomy and want to learn about techniques for obtaining and analyzing astronomical data. This course will review the properties of light and discuss the process of experimental design. The course will describe basic observational tools such as telescopes and detectors. It will discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for. Some topics in basic astronomical data analysis will be discussed, with topical emphasis determined by the instructor. Some simple data analysis projects will be assigned. May be repeated up to 3 credits.

Prerequisite: MATH 1511G and (PHYS 2140 or PHYS 1320G) and (ASTR 1120G, ASTR 1115G, or ASTR 401).

Learning Outcomes

1. Review the properties of light and discuss the process of experimental design.
2. Describe basic observational tools such as telescopes and detectors.
3. Discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for.
4. Discuss topics in basic astronomical data analysis.

ASTR 403. Fundamentals of Astronomy**3 Credits (3)**

This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology. While this course is designed for first year graduate students, it is also cross-listed as a undergraduate course for students who have already had some exposure to astronomy and are prepared for a fast-paced review of fundamental topics and concepts in astronomy. Undergraduates will have a reduced homework load. Consent of Instructor required. Crosslisted with: ASTR 505.

Prerequisite(s): ASTR 401 or demonstrated background in astronomy and problem solving.

ASTR 500. Seminar**1 Credit (1)**

Organized group study treating selected topics.

ASTR 503. Fundamentals of Astrophysics**3 Credits (3)**

This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

Learning Outcomes

1. Ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics.
2. Discuss orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

ASTR 506. Dynamics and Hydrodynamics**3 Credits (3)**

Graduate level course on basic stellar dynamics and fundamentals of hydrodynamics. May be repeated up to 3 credits.

Learning Outcomes

1. Learn and be able to apply basics of stellar dynamics and hydrodynamics.

ASTR 535. Observational Techniques**3 Credits (3)**

Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss an introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.

ASTR 545. Stellar Spectroscopy**3 Credits (3)**

This course covers the physics of stellar atmospheres with emphasis on using spectra as a diagnostic tool for understanding the properties of stars. Topics include spectral classification, radiative transfer, gas equilibrium physics, line and continuum opacities, adiabatic and superadiabatic convection, and extraction of observed quantities from spectra for deducing physical conditions of the source.

ASTR 555. Galaxies I**3 Credits (3)**

Fundamentals of the properties of galaxies and galaxy components, including stars and stellar populations, gas and dust, central black holes, and dark matter. Includes a detailed description of the properties of the Milky Way Galaxy.

ASTR 565. Stellar Interiors**3 Credits (3)**

Internal constitutions of stars, computation of stellar models, and stellar evolution.

ASTR 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental.

ASTR 599. Master's Thesis**1-15 Credits (1-15)**

Master's level research in astrophysics or observational astronomy. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

ASTR 600. Pre-dissertation Research**1-15 Credits**

Research.

ASTR 601. Thesis Proposal Preparation**1 Credit (1)**

This is a one-credit course that introduces students to Departmental expectations regarding the Thesis Proposal and provides rigorous training in proposal-writing. Drawing heavily from the presentation in the course textbook, Writing Science by Joshua Schimel, students will practice devising, developing, and proposing three new ideas for astronomical research over the course of the academic term. Classroom activity will consist of a mixture of short lecture-discussions and focused peer-editing sessions; homework will consist of readings and writing assignments. While the course will assist students in developing their thesis proposals, its topics are general enough to be useful for any proposal. Students taking Pre-Dissertation Research in their fifth semester are required to register for this course, while students in their fourth and fifth years who have not yet defended their thesis proposals are strongly encouraged to join them. This course should not change the total number of credits for which students are expected to register in a semester

Corequisite: ASTR 600.

Learning Outcomes

1. Provide continuing programmatic/structural support to students as they transition from structured coursework/cumes to unstructured thesis work.
2. Suppress the temptation for students to distance physically starting in the third year.
3. Optimize balance between programmatic progress and ongoing research/outreach commitments.
4. Clarify thesis proposal expectations and improve consistency between experiences of different students.
5. Suppress thesis proposal inflation.
6. Train students in ideation and proposal writing.

ASTR 605. Interstellar Medium**3 Credits (3)**

Basics of radiative transfer and processes in the interstellar medium. Properties of dust and infrared emission from grains. Applications to neutral atomic and molecular gas and ionized plasmas in galaxies. May be repeated up to 3 credits.

ASTR 616. Galaxies II**3 Credits (3)**

Galaxy formation within a cosmological context. Topics include an introduction to cosmology, the growth of linear and nonlinear structures, the formation of dark matter halos, galaxy growth and feedback processes, and their observational signatures in the intergalactic and circumgalactic media.

ASTR 620. Planetary Processes**3 Credits (3)**

Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.). Restricted to Astronomy Majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.)

ASTR 621. Planetary System Formation**3 Credits (3)**

The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy. May be repeated up to 3 credits. Restricted to: ASTR majors.

ASTR 630. Advanced Methods in Astrophysics**3 Credits (3)**

Provides basic background in numerical and statistical methods relevant to astrophysical research. Topics include a review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics. May be repeated up to 3 credits.

Learning Outcomes

1. Perform basic background in numerical and statistical methods relevant to astrophysical research.
2. Review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics.

ASTR 670. Heliophysics, Space Plasmas, and Space Weather**3 Credits (3)**

Explore the Sun and its processes. the heliosphere, and its interactions with the planets. Topics include: A introductory description of space weather and its physics; energy interaction with the space environment; the quiet Sun and its interactions with planetary atmospheres (with an emphasis on Earth); Magnetohydrodynamics; frozen-in flux; the solar wind; magnetized fluid dynamics; the active Sun(flares and coronal mass ejections); the effects of Space Weather. May be repeated up to 3 credits.

Learning Outcomes

1. Manipulate the equations of electromagnetism for any astrophysical plasma, and thereby predict the behavior of any plasma under specific conditions.
2. Use the equations of electromagnetism to explain temporal and spatial size scales throughout the heliosphere.
3. Interpret the role magnetism plays in both the storage and release of energy in plasmas.
4. Analyze the effect and impact of solar particles and radiation on Earth, and at other planets.

ASTR 671. Solar Astrophysics

3 Credits (3)

Solar astrophysics, including observational and theoretical aspects of the Sun's atmosphere. Although focused on the Sun, the course will be conducted so be of general interest to all astronomy graduate students

Learning Outcomes

- 1. Develop critical thinking skills in study the solar atmosphere.
- 2. Asses the validity of solar MHD and other approximations in uncovering the physics of the Sun.
- 3. Investigate the evolution of solar features at multiple size scales.
- 4. Determine the connections of the solar plasma oscillations and particle acceleration to energy release processes.

ASTR 698. Special Topics.

1-9 Credits

Special topics.

ASTR 700. Doctoral Dissertation

1-15 Credits (1-15)

Dissertation. May be repeated up to 88 credits.

Learning Outcomes

- 1. Varies

Phone: (575) 646-4438

Website: <http://astro.nmsu.edu/> (<http://astro.nmsu.edu/>)

Astronomy - Undergraduate Minor

The department offers a minor created for majors in a variety of scientific fields, and two minor emphases specifically designed to address the needs and interests of students from the Colleges of Education and Engineering. Any undergraduate, however, may pursue any of the three minor tracks.

Requirements

The requirements for the regular minor requires 19 credits, from the following:

Prefix	Title	Credits
Requirements		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	4
or ASTR 1120G	The Planets Lecture & Laboratory	
Select two from the following: ¹		6
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
Select 9 credits between the following groups: ²		9
<i>Group A</i>		
Select 6-9 credits from the following: ²		
ASTR 401	Topics in Modern Astrophysics	
ASTR 402	Astronomical Observations and Techniques	
<i>Group B</i>		
Select 3-9 credits from the following: ^{2,4}		
A E 424	Aerospace Systems Engineering	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 473	Ecology of Microorganisms	
C S 475	Artificial Intelligence I	

C S 482	Database Management Systems I
C S 491	Parallel Programming
CHEM 431	Physical Chemistry
CHEM 433	Physical Chemistry I
E E 395	Introduction to Digital Signal Processing
E E 400	Undergraduate Research
E E 444	Advanced Image Processing
E E 446	Digital Image Processing
E E 454	Antennas and Radiation
E E 460	Space System Mission Design and Analysis
E E 465	Machine Learning I
E E 473	Introduction to Optics
E E 478	Fundamentals of Photonics
ENGR 401	Engineering Capstone I
ENGR 402	Engineering Capstone II
GEOL 465	Isotope Geochemistry
MATH 471	Complex Variables
MATH 472	Fourier Series and Boundary Value Problems
PHYS 451	Intermediate Mechanics I
PHYS 461	Intermediate Electricity and Magnetism I
PHYS 480	Thermodynamics
STAT 371	Statistics for Engineers and Scientists I
STAT 470	Probability: Theory and Applications
STAT 480	Statistics: Theory and Applications

Total Credits **19**

- ¹ Three credits of ASTR 400 Undergraduate Research may replace one of these courses.
- ² ASTR 401 Topics in Modern Astrophysics and ASTR 402 Astronomical Observations and Techniques are the preferred classes but are generally offered only in alternate years. Three credits of ASTR 400 Undergraduate Research may replace one of these courses, but not the same three if used above.
- ³ Cross-listed with graduate classes and require special permission.
- ⁴ Alternative 400-level courses in the physical sciences, engineering, or related fields, including one-time seminars, may be proposed on a case-by-case basis to fulfill this requirement, drawn from the fields of astronomy, biochemistry, biology, chemistry, computer science, geology, geophysics, mathematics, physics, statistics or from engineering. Proposals should include a clear justification that connects the course materials to a particular topic in astronomy or astrophysics.

Emphasis: Education

The requirements for the education track minor requires 18-20 credits from the following:

Prefix	Title	Credits
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	4
ASTR 1120G	The Planets Lecture & Laboratory	4
Select two from the following:		6
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
Select 4-6 credits from the following: ⁵		4-6
ASTR 400	Undergraduate Research	
ASTR 401	Topics in Modern Astrophysics	
ASTR 402	Astronomical Observations and Techniques	

EDUC 4310	Methods of Teaching Elementary School Science
EDUC 4410	Teaching Science at the Middle and High School Level
Total Credits	18-20

⁵ This requirement will generally be fulfilled by two 3-credit courses. Students may request the 4 credit option instead, if an appropriate topic and instructor for 1 credit of ASTR 400 Undergraduate Research are available. ASTR 401 Topics in Modern Astrophysics and ASTR 402 Astronomical Observations and Techniques are generally offered only in alternate years, and have prerequisites.

Emphasis: Engineering

The requirements for the engineering track minor requires 18-19 credits from the following:

Prefix	Title	Credits
Required Courses		
Select 3-4 credits from the following:		3-4
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
PHYS 1310G	Calculus -Based Physics I	
PHYS 1320G	Calculus -Based Physics II	
Select one from the following:		3
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
Select 12 credits from the following two groups:		12
Group A		
Select 6-9 credits from the following: ⁶		
A E 428	Aerospace Capstone Design	
ASTR 400	Undergraduate Research	
ASTR 401	Topics in Modern Astrophysics ⁷	
ASTR 402	Astronomical Observations and Techniques ⁷	
E E 400	Undergraduate Research	
M E 400	Undergraduate Research	
Group B		
Select 3-6 credits from the following: ⁹		
A E 424	Aerospace Systems Engineering	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 473	Ecology of Microorganisms	
C S 475	Artificial Intelligence I	
C S 482	Database Management Systems I	
C S 491	Parallel Programming	
CHEM 431	Physical Chemistry	
CHEM 433	Physical Chemistry I	
E E 454	Antennas and Radiation	
E E 460	Space System Mission Design and Analysis	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
GEOL 465	Isotope Geochemistry	
MATH 471	Complex Variables	
MATH 472	Fourier Series and Boundary Value Problems	
PHYS 451	Intermediate Mechanics I	

PHYS 461	Intermediate Electricity and Magnetism I
PHYS 480	Thermodynamics
STAT 371	Statistics for Engineers and Scientists I
STAT 470	Probability: Theory and Applications
STAT 480	Statistics: Theory and Applications
Total Credits	18-19

⁶ Taking any of the non-astronomy classes for this requirement requires prior approval from the head of astronomy on a case-by-case basis, with a clear connection being established between the proposed research or design project and a particular topic in astronomy or astrophysics (astronomy instrumentation or observational projects are particularly encouraged); no more than 3 non-ASTR credits can be counted toward the minor.

⁷ Generally offered in alternate years.

⁸ Cross-listed with graduate classes and require special permission.

⁹ Alternative 400-level courses in the physical sciences, engineering, or related fields, including one-time seminars, may be proposed on a case-by-case basis to fulfill this requirement, drawn from the fields of astronomy, biochemistry, biology, chemistry, computer science, geology, geophysics, mathematics, physics, statistics, or from engineering. Proposals should include a clear justification that connects the course materials to a particular topic in astronomy or astrophysics.

Biology

Undergraduate Program Information

A student may earn the Bachelor of Arts in biology or the Bachelor of Science in biology, genetics, microbiology, or conservation ecology through major studies in the Department of Biology. The Bachelor of Science in biology or microbiology is recommended for premedical and pre dental students, for those preparing to teach biology and other sciences at the secondary and college levels, for those interested in the numerous fields of biological research and applied biology, and for those planning on obtaining an advanced degree in biology.

Freshmen should begin taking required biology and chemistry courses in their first year. Degree plans for specific areas of interest can be obtained from the Biology Success Center (<https://bio.nmsu.edu/success2.html>) in Foster Hall room 204. More information on the Department of Biology is available on our web site (<http://bio.nmsu.edu>).

A student must earn a grade of C- or better to receive credit for any nondepartmental or departmental requirement for any major or minor offered by the Department of Biology.

Students who wish to explore a minor or supplementary course work in a specific discipline to enhance their academic experience are encouraged to speak with an advisor. The Biology Department offers minors in biology, microbiology, human biology, conservation ecology, or genetics and biotechnology. A student may not earn a major and a minor in the same discipline.

A student must fulfill a second language requirement to receive a Bachelor of Arts or Bachelor of Science degree in the Biology and Microbiology majors. ***This requirement does not apply to the Conservation Ecology major, offered jointly with the Department of Fisheries, Wildlife and Conservation Ecology, or the Genetics and Biotechnology major, offered jointly with the Department of Plant and Environmental Science.*** To meet the second language requirement, the student must do one of the following:

- Complete two semesters of second language courses numbered 1110 and 1120 with a grade of C- or better. Spanish speakers should complete SPAN 1210 Elementary Spanish for Heritage Learners I, SPAN 1220 Spanish for Heritage Learners II or SPAN 2210 Spanish for Heritage Learners III with a C- or better to fulfill the requirement.
- Challenge the 1120 level of French, Chinese, German, Japanese, or Spanish; or the 1130 level for the Spanish-for Heritage Learners student or the 1130 level for Portuguese.
- Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level. (i.e. equivalent to FREN 2120G French IV, GRMN 2120 German IV, SPAN 2120 Spanish IV, etc.)
- Complete two semesters of American Sign Language, courses SIGN 1110 American Sign Language I and SIGN 1120 American Sign Language II, with a grade of C- or better.
- Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.
- Obtain certification of a working knowledge of a Native American language from the American Indian program director.
- Obtain certification of a working knowledge of a second language if such language is not taught at NMSU from the head of the Department of Languages and Linguistics.
- In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Graduate Program Information

The Department of Biology offers research and coursework that cover the natural world whether it is at the molecular, organismic, or ecosystem level. Our goal is to prepare students for careers in diverse areas such as ecology, microbiology, evolution, botany, health science, and biology education through formal coursework, research experiences, interactive seminars, and professional development activities. Biology graduate students conduct their own research in a productive environment using state-of-the-art facilities. The Biology Department offers the following degree emphasis:

- Thesis Masters research program in Biology (M.S.)
- Non-thesis Masters program in Biology (M.S.)
- Non-thesis Masters program in Biology (Biotechnology emphasis) (M.S.)
- Doctorate research program in Biology (Ph.D.)

For research toward the Master of Science or the Doctorate of Philosophy, students can choose among the Department’s three areas of emphasis:

1. Behavioral, Ecological, and Evolutionary Biology
2. Cell and Organismal Biology
3. Microbiology

There are two formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are

Prefix	Title	Credits
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3

All graduate students develop their curriculum plan in consultation with their faculty advisor and graduate committee. Graduate students may also take a minor in other graduate departments and programs. Sample course sequences within the Department’s three different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website (<https://bio.nmsu.edu/students/grads.html>).

All prospective applicants must submit all required materials specified in the Department Graduate Application Packet available in the Graduate Student section of the Biology website (<https://bio.nmsu.edu/students/grads.html>).

Degrees for the Department

Bachelor Degree(s)

- Biology - Bachelor of Arts (p. 501)
- Biology - Bachelor of Science (p. 503)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 505)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 507)
- Microbiology - Bachelor of Science (p. 509)

Master Degree(s)

- Biology - Master of Science (p. 105)

Doctoral Degree(s)

- Biology - Doctor of Philosophy (p. 179)

Minors for the Department

- Biology - Undergraduate Minor (p. 511)
- Conservation Ecology - Undergraduate Minor (p. 512)
- Genetics and Biotechnology - Undergraduate Minor (p. 512)
- Human Biology - Undergraduate Minor (p. 512)
- Microbiology - Undergraduate Minor (p. 513)

C. Shuster, Professor, Department Head
Donovan Bailey, Professor, Associate Department Head

Professors Bailey, Boecklen, Hanley, Hansen, Houde, Milligan, C. Shuster, M. Shuster, Serrano, Smith, Unquez, Wright, Xu; **Associate Professors** Castillo, Curtiss, James, Mabry; **Assistant Professors** Catalan-Dibene, Orr, Romero-Olivares

C. D. Bailey, Ph.D. (Cornell)– plant systematics; W. J. Boecklen, Ph.D. (Northern Arizona)– plant/ insect and community ecology; M. G. Castillo, Ph.D. (Wisconsin)– microbiology/immunology; J. Catalan-Dibene, Ph.D. (University of California-Irvine)- microbiology and immunology; J. Curtiss, Ph.D. (University of Colorado at Boulder)– cell and development; K. A. Hanley, Ph.D. (California-San Diego)– evolution, ecology, and control of flaviviruses; I. A. Hansen, Ph.D. (University of Wurzburg)– molecular vector biology; P. W. Houde, Ph.D. (Howard)– avian systematics; A. C. James, Ph.D. (University of Rochester)- science education; K. E. Mabry, Ph.D. (California-Davis)– behavioral ecology; B. G. Milligan, Ph.D. (California-Davis)– plant evolutionary biology; T. J. Orr, Ph.D. (University of California, Riverside)- reproductive physiology/ecology; A. L. Romero-Olivares, Ph.D. (University of California-Irvine)- soil microbiology/microbial ecology; E. E. Serrano, Ph.D. (Stanford)– biophysics, neuroscience; C. B. Shuster, Ph.D. (Tufts)– cell and developmental biology; M. Shuster, Ph.D. (Tufts)– biology education; G. B. Smith, Ph.D. (North Carolina State)– environmental microbiology; G. A.

Unquez, Ph.D. (California-Los Angeles)– *developmental biology*; T. F. Wright, Ph.D. (California-San Diego)– *animal behavior and evolution*; J. Xu, Ph.D. (Military Medical University, Shanghai)– *mosquito-malaria interactions*.

Biology Courses

BIOL 1120G. Human Biology

3 Credits (3)

This course is an introduction to modern biological concepts with an emphasis on the relevance to humans and their relationships with the environment.

Learning Outcomes

1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability).

BIOL 1120L. Human Biology Laboratory

1 Credit (3P)

This course introduces exercises, experiences, and activities exploring biological concepts and theories relevant to humans and their relationship to the environment in a laboratory setting.

Prerequisite(s)/Corequisite(s): BIOL 1120G.

Learning Outcomes

1. Understand general principles of cell structure and function.
2. Understand general principles of genetics.
3. Understand basic human anatomy and physiology.
4. Communicate scientific information effectively.
5. Demonstrate an understanding of the scientific method.
6. Knowledge of appropriate laboratory skills
7. Apply quantitative reasoning and scientific thinking to real world problems.

BIOL 1130G. Introductory Anatomy & Physiology (non-majors)

4 Credits (3+3P)

This course introduces the anatomy (structure) and physiology (function) of the human body, which includes the study of basic chemistry, molecules, cells, tissues, organs, organ systems, and terminology related to these concepts. May be repeated up to 4 credits. Restricted to Community Colleges campuses

Learning Outcomes

1. (Lecture) Define and explain anatomy and physiology.
2. (Lecture) Use anatomic directional, regional, and sectional terminology related to the human body.
3. (Lecture) Explain and describe the basic chemical principles of the human body including the structure and function of carbohydrates, lipids, proteins and nucleic acids.
4. (Lecture) Develop a basic familiarity with cells and cell organelles that include cell division, DNA replication, and protein synthesis.
5. (Lecture) Describe the structure and function of the major tissues in the human body.
6. (Lecture) Identify and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
7. (Lecture) Describe the basic physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
8. (Lecture) Apply and describe the principles of homeostasis in the human body.
9. (Laboratory) Use and apply proper anatomic terms 1
10. (Laboratory) Develop skills using the microscope correctly. 1
11. (Laboratory) Identify basic tissue types. 1
12. (Laboratory) Discuss and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems. 1
13. (Laboratory) Demonstrate and describe physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.

BIOL 1190G. Contemporary Problems in Biology

4 Credits (3+3P)

Fundamental concepts of biology will be presented using examples from relevant problems in ecology, medicine and genetics. For nonscience majors only. Community Colleges only.

Learning Outcomes

1. Identify the unity and diversity of living things
2. Identify the structure and function of cells and biological molecules
3. Recognize and demonstrate patterns of inheritance
4. Describe mechanisms of evolution
5. Describe the human body systems including immune response
6. Discuss population dynamics and ecological systems
7. Describe the process of scientific inquiry, solve problems scientifically, and communicate on a scientific level
8. Apply quantitative analysis and scientific thinking to scientific and real world problems

BIOL 1996. Topics in Biology**1-3 Credits (1-3)**

Introductory level coverage of biological topics. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

BIOL 2110G. Principles of Biology: Cellular and Molecular Biology**3 Credits (3)**

This course introduces students to major topics in general biology. This course focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, DNA replication, transcription, and translation. Must be taken with BIOL 2110L to meet general education requirements. May be repeated up to 3 credits.

Prerequisite/Corequisite: a C- or better in MATH 1215 or higher and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).

Learning Outcomes

1. Apply the scientific method to develop and evaluate hypotheses and propose an experiment to test a scientific hypothesis related to cell biology and molecular biology.
2. Describe the distinguishing characteristics of various biological molecules (water, carbohydrates, lipids, proteins, and nucleic acids).
3. Compare and contrast the basic features of cells and how prokaryotic cells differ from eukaryotic cells.
4. Understand how organisms maintain homeostasis in a dynamic environment.
5. Describe how biological molecules are acquired and how they are subsequently used to meet the metabolic needs of organisms.
6. Describe membrane structure and function.
7. Describe and analyze the nature of bioenergetic transformations and metabolism within the cell.
8. Describe the processes of cellular respiration and photosynthesis.
9. Analyze with specific detail the processes of DNA replication, transcription, and translation. 1
10. Analyze with specific detail the types, mechanisms, and regulation of cellular division. 1
11. Assess important applications of cell and molecular biology to energy use, medicine, and other day-to-day processes.

BIOL 2110L. Principles of Biology: Cellular and Molecular Biology**Laboratory****1 Credit (3P)**

This course introduces students to major topics in general biology. This course focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, genetics, DNA replication, transcription, and translation. May be repeated up to 1 credit.

Prerequisite: MATH 1215 or higher, and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).

Prerequisite/Corequisite: BIOL 2110G.

Learning Outcomes

1. Describe and apply the scientific method to solve problems in biological context
2. Demonstrate knowledge of laboratory safety skills and procedures.
3. Practice principles of scientific method while conducting laboratory activities and experiments.
4. Perform laboratory activities using relevant laboratory equipment, chemical reagents, and supplies to observe biological specimens, to measure variables, and to design and conduct experiments.
5. Operate light microscopes, prepare wet mount slides, and use stains.
6. Exhibit ability to use pipettes and other volumetric measuring devices, chemical glassware, balances, pH meters or test papers, spectrophotometers, and separation techniques, such as chromatography and/or electrophoresis to perform activities relevant to other course competencies.
7. Analyze and report data generated during laboratory activities and experiments.

BIOL 2210. Human Anatomy and Physiology I for the Health Sciences**4 Credits (3+3P)**

This course is the first of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on anatomic, directional, and sectional terminology, basic cellular structure and metabolism, tissue differentiation and characteristics, and organ system structure and function; Specifically the integumentary, skeletal, muscular, and nervous systems.

Prerequisite(s)/Corequisite(s): CHEM 1120G or CHEM 1215G. Restricted to: Community Colleges only.

Learning Outcomes

1. Describe and apply anatomical terminology.
2. Describe multi cellular organization.
3. Distinguish and describe major tissue types.
4. Describe the structure and function of the integumentary system.
5. Describe the structure and function of the skeletal system.
6. Describe the structure and function of the muscular system.
7. Describe the structure and function of the nervous system.
8. Describe the structure and function of the special senses.
9. Define homeostasis and describe specific examples for the integumentary, skeletal, muscular, and nervous systems.

BIOL 2221. Human Physiology**3 Credits (3)**

Physical and chemical operation of the organs and systems of the human body. Not open to students who have passed BIOL 354 or BIOL 381.

Prerequisite(s): Grade of at least C- in BIOL 2110G; BIOL 2110L; CHEM 1215G or CHEM 1120G.

Learning Outcomes

1. Understand the central physiological principle of homeostasis
2. Be able to explain why concentration gradients are essential to maintain homeostasis
3. Understand the regulation of homeostasis by neuronal / endocrine chemical messengers
4. Understand that changes in bodily function occur throughout the entire life span of the human animal
5. Incorporate the importance of evolutionary biology to your understanding of human disease
6. Teach a physiological concept to your classmates
7. Design experiments to test physiological concepts
8. Put in plain words how the laws of thermodynamics can explain human disease

BIOL 2225. Human Anatomy and Physiology II**4 Credits (3+3P)**

This course is the second of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on specific cellular, tissue, and organ structure and physiology, and organ system structure and function; specifically the endocrine, cardiovascular, respiratory, urinary, and reproductive systems. Additionally, an analysis of these concepts is included: fluid and electrolyte balance, pregnancy, growth and development from zygote to newborn, and heredity. Restricted to: Community Colleges only.

Prerequisite(s): BIOL 2210, CHEM 1120G or CHEM 1215G.

Learning Outcomes

1. Identify and describe the major anatomical features of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.
2. Analyze the physiological roles of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems in maintaining homeostasis in the human body.
3. Explain how fluid and electrolyte balance is maintained in the human body.
4. Compare and contrast the anatomy and physiology of male and female reproductive systems.
5. Describe pregnancy from conception to parturition including human growth and development from zygote to newborn.
6. Explain heredity and genetic control.

BIOL 2310. Microbiology**3 Credits (3P)**

Introduction to the basic principles of microbiology, microbial pathogenesis, host defenses and infectious diseases. The course will emphasize concepts related to the structure and function of microorganisms, including their mechanisms of metabolism and growth. Host parasite interactions will also be emphasized, including mechanisms of microbial pathogenesis and mechanisms of host defenses against infectious diseases. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEM 1120G or CHEM 1215G or CHEM 1225G.

Corequisite(s): BIOL 2310L.

Learning Outcomes

1. Describe and compare the structure and function of prokaryotic and eukaryotic cells.
2. Describe and compare the techniques used for staining of and microscopic observation of bacteria including morphology.
3. Describe the nutritional requirements for bacterial growth and the impact of environmental factors on bacterial growth (temperature, pH, oxygen, etc.).
4. Describe and compare the mechanisms of aerobic respiration, anaerobic respiration, and fermentative metabolism.
5. Describe the mechanism of bacterial growth by binary fission, and laboratory methods used for observing and measuring bacterial growth.
6. Describe the mechanisms of bacterial DNA replication, RNA transcription, and translation, and compare and contrast with eukaryotic cells.
7. Describe the structure and replication strategies of viruses.
8. Describe and contrast mechanisms of innate nonspecific immunity and adaptive specific immunity.
9. Describe immune hypersensitivity reactions, autoimmune diseases, and immunodeficiency diseases. 1
10. Differentiate between host microbe relationships, mechanisms of microbial pathogenesis, differentiate between communicable and noncommunicable diseases and describe mechanisms of direct and indirect transmission of communicable diseases.

BIOL 2310L. Microbiology Lab**1 Credit (3P)**

This course will emphasize both the theory and hands-on application of techniques used in a microbiology laboratory for the growth and identification of bacterial species. Students will learn microscopy skills and staining techniques for the observation of bacteria. Students will also learn aseptic techniques used for isolation of bacteria, inoculation of cultures, and interpretation of selective and differential growth media for the identification of bacterial species.

Prerequisite: BIOL 2310 or BIOL 2320 or concurrent enrollment.

Learning Outcomes

1. Demonstrate skills of microscopy.
2. Demonstrate skills of bacterial staining.
3. Demonstrate aseptic technique for inoculation of bacterial growth media.
4. Interpret results from selective and differential media.
5. Demonstrate appropriate use of diagnostic reagents.
6. Interpret results of diagnostic assays.
7. Identify unknown bacterial species through the use of a dichotomous key, inoculation and interpretation of laboratory assays, and application of the scientific method.

BIOL 2320. Public Health Microbiology**3 Credits (3)**

This course introduces microbiology on the health profession level. It incorporates cell structure, metabolism, growth, controls of growth, infectious epidemiology, etiology, pathogenicity, and relative virulence of pathogens. It will lead to students assessing a clinical infection scenario from the microbiological perspective that includes making diagnoses based on data from appropriate diagnostic tests, investigating appropriate treatment options, and making recommendations for prevention.

Prerequisite: BIOL 2110G and BIOL 2110L.

Learning Outcomes

1. Identify key physical features of various infectious agents and describe their structure and function in the pathogen
2. Describe the microbiological, serological, biochemical and genetic tests that are used to identify infectious agents in a laboratory setting and be able to interpret test results in order to identify the pathogen
3. Explain how structural and metabolic differences between infectious agents and human host can be exploited for chemotherapy
4. Explain the observed effect of a particular environmental change on the growth of a given microorganism, and the relationship between bacterial growth patterns and selected foodborne illnesses
5. Describe several mechanisms by which pathogens generate genetic diversity and the role genetic diversity plays in resistance to therapy and treatment failure
6. Explain the role of innate, and adaptive immunity in host defense
7. Describe general virulence strategies used by variety of pathogens, and different types of vaccines along with recommendations for vaccinations of specific populations
8. Demonstrate understanding of signs and symptoms of selected diseases, and be able to relate disease agents with environmental reservoirs and transmission

BIOL 2505. Pathophysiology**3 Credits (3)**

This course is designed to provide the conscientious student with a solid foundation for understanding the pathophysiological processes of the human organism. Successful completion of this course will promote the general student learning outcomes listed below. Corequisite/ Prerequisites(s): AHS 154 or BIOL 2225. Restricted to: Community Colleges only.

Prerequisite(s): AHS 153 or BIOL 2210.

Learning Outcomes

1. To describe the general concepts of disease processes and factors associated with disease causation.
2. To identify the function of basic cellular structures, determining the process of cellular malfunctions.
3. To describe the response of the body to injury and immunologic challenge.
4. To discuss the etiology, pathogenesis, and treatment modalities of frequently occurring diseases.

BIOL 2511. Human Pathophysiology**3 Credits (3)**

The first in a two-course sequence that covers changes in body physiology that result from disease or injury. Includes a general introduction to pathophysiology as well as an overview of altered cellular and tissue biology, injury, inflammation, and neoplasia. Students will also explore deviation from fluid, hemodynamic, and endocrinologic balance. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of C- or higher in BIOL 2210 and BIOL 2225.

Learning Outcomes

1. The cellular adaptations occurring in atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia; the types and causes of cellular injury; and the types of necrosis.
2. The different compartments for body fluids; the factors that affect water movement; the processes that drive and affect capillary exchange; the mechanisms causing edema; the electrolytes in body compartments; the various electrolyte imbalances; the body mechanisms that maintain acid-base balance; and the various acid-base imbalances and how they are compensated for.
3. The interrelationships of DNA, RNA, and proteins; the various types of mutations; the various types of mutagens, the various types of numerical and structural chromosomal aberrations; the various genetic terms; the single-gene disorders discussed in class; the multifactorial disorders discussed in class.
4. The relationships between genes, environment, and multifactorial diseases; the criteria used to define multifactorial disease; the characteristics of multifactorial traits; and the various features of the threshold model.
5. The terms related to tumor/cancer biology, classification, and nomenclature; the various features of cancer biology, including the characteristics of cancer and the genetic basis of cancer; features related to cancer invasion and metastasis; and the clinical manifestations and treatments of cancer.
6. Features related to Innate and adaptive immunity; features related to the first, second, and third lines of defense; the mechanisms and manifestations of inflammation; components/mechanisms related to the complement, clotting, and kinin systems; mechanisms of wound healing; and features of dysfunctional wound healing.
7. Aspects/mechanisms of specific (adaptive) immunity, features related to the structure, function, and classification of immunoglobulins; features related to haptens, antigens, immunogens, and epitopes; the different types of antigens; features related to immunological memory; and features related to the different types of active and passive immunity.
8. Aspects related to allergy, autoimmunity, and alloimmunity; aspects/mechanisms/examples related to the four basic types of hypersensitivity reactions; mechanisms and examples related to autoimmunity; and aspects/mechanisms related to immunodeficiency.
9. The risk factors for infection; the six components of the chain of infection; general concepts, terms, and processes/mechanisms related to basic microbiology; and the mechanisms of microbial pathogenicity.
10. General concepts, terms, and processes/mechanisms related to normal hormonal action; mechanisms of hormonal alterations; processes/mechanisms related to the pathophysiology of the various disorders discussed in class; and the clinical manifestations and treatment of the hormonal alterations discussed in class.

BIOL 2512. Human Pathophysiology II**3 Credits (3)**

The second in a two-course sequence that covers changes in body physiology that result from disease or injury. This course focuses on the pathophysiology of the nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.

Prerequisite: Grade of C- or higher in BIOL 2210, BIOL 2225, and BIOL 2511.

Learning Outcomes

1. The different types of sensory modalities; the different dysfunctions of the general and special senses; the different pain theories discussed in class; the various aspects of the neuroanatomy and neuromodulation of pain; the various clinical descriptions of pain; the various aspects of temperature regulation; components of the pathogenesis of fever; the various disorders of temperature regulation; the various aspects of sleep disorders; the various components of visual dysfunction; and the various aspects of auditory, gustatory, and olfactory dysfunction.
2. The various alterations in cognitive systems; the various alterations in arousal; the outcomes of alterations in arousal; the various alterations in awareness; the various seizure disorders; the various data processing deficits; various alterations in cerebral hemodynamics; and alterations in neuromotor function.
3. The various disorders of the central and peripheral nervous systems; and the various disorders of the neuromuscular junction.
4. The components of normal blood; the process/stages of hematopoiesis; the various normal RBC laboratory values; the components and functions of the lymphatic system; the various types of imbalances of erythropoiesis; the various types of anemias and their causes; the various types of polycythemia and their causes; the processes related to hemostasis; the various alterations of white blood cells and their causes; and the various alterations of lymphoid and hemostatic function.
5. The various diseases of the veins; the various diseases of the arteries; the various aspects of atherosclerosis; features related to the pathogenesis and consequences of coronary artery disease; the disorders of the heart wall and their consequences; the various aspects of valvular dysfunction; aspects of the pathogenesis and manifestations of rheumatic disease; the causes, pathogenesis, and manifestations of infective endocarditis; the causes, manifestations, and pathophysiology of heart failure; and the various types of shock.
6. The various signs and symptoms of pulmonary disease; the various conditions caused by pulmonary disease/injury; the various disorders of the chest wall and pleura; and the causes, manifestations, and pathophysiology of selected pulmonary disorders.
7. The features and consequences of upper and lower urinary tract obstruction; the various types of urinary tract infection; the causes, pathogenesis, and clinical manifestations of glomerulonephritis; the various features of nephrotic and nephritic syndrome; and the various features (etiology, pathophysiology, and clinical manifestations) of both acute kidney injury and chronic kidney disease.
8. The various clinical manifestations of gastrointestinal dysfunction; the various aspects (etiology, pathophysiology, and clinical manifestations) of disorders of motility; the causes, manifestations, and pathophysiology of gastritis; features related to the causes, manifestations, and pathophysiology of peptic ulcer disease; features related to the etiology, pathogenesis and pathophysiology of selected malabsorption syndromes, inflammatory bowel diseases, diverticular disease of the colon, appendicitis, and irritable bowel syndrome;

BIOL 2610G. Principles of Biology: Biodiversity, Ecology, and Evolution
3 Credits (3)

This course is an introduction to the dynamic processes of living things. Major topics include the mechanisms of evolution, biological diversity, Mendelian genetics, and ecology.

Prerequisite/Corequisite: grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.

Learning Outcomes

1. Understand the scientific method and apply it to biological topics of genetics, evolution, ecology, and biodiversity.
2. Apply quantitative reasoning and scientific thinking to real world problems.
3. Identify and describe the basic principles of evolution.
4. Analyze the relationships between the genetics of populations and evolution.
5. Analyze the processes of speciation.
6. Describe how the hierarchical classification scheme is used to categorize organisms.
7. Describe how DNA research has modernized bio systematics.
8. Compare and contrast the general characteristics of each of the living domains and kingdoms.
9. Relate the structure of organisms to the way they function. 1
10. Explain how the life histories of organisms are adapted for different environments. 1
11. Relate the complexity of behavior to the overall complexity of an organism. 1
12. Describe the ecological roles played by organisms in each kingdom. 1
13. Compare basic ecological principles at the population and community levels of organization. 1
14. Describe and compare energy relationships and the cycling of materials in ecosystems. 1
15. Identify and describe the basic principles of Mendelian genetics.

BIOL 2610L. Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
1 Credit (3P)

This laboratory course is an introduction to the dynamic processes of living things. This course introduces students to the methods used in the study of Mendelian genetics, evolution, ecology, and biological diversity. Designed for students continuing in life sciences.

Prerequisite/Corequisite: BIOL 2610G; grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.

Learning Outcomes

1. Describe and apply the scientific method to generate testable hypotheses in evolution and ecology.
2. Design and conduct laboratory experiments using relevant laboratory equipment and methods.
3. Analyze and report data generated during laboratory activities and experiments.
4. Communicate scientific results from experiments in Mendelian genetics, evolution, ecology, and biodiversity.

BIOL 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits. Community Colleges only.

Learning Outcomes

1. Varies

BIOL 301. Principles of Ecology**3 Credits (3)**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. MATH 1511G and A ST 311 recommended. Same as ENVS 301. Crosslisted with: ENVS 301.

Prerequisite(s): BIOL 2610G, MATH 1220G.

BIOL 302. Molecular Biology Techniques Laboratory**3 Credits (6P)**

This combined lecture and laboratory course emphasizes molecular biology laboratory practices through the hands-on application of commonly applied techniques, protocols, and equipment. The topics covered include both the fundamental development of empirical data as well as data analysis using stand-alone and web-based resources. Consent of instructor required.

Prerequisite(s): BIOL 2110G or equivalent, and MATH 1220G.

BIOL 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

BIOL 309. Guided Biological Research Lab**3 Credits (3)**

This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career undergraduates who have finished the introductory sequence of Biology courses. Topics will vary with instructor.

Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 311. General Microbiology**3 Credits (3)**

Principles of physiology, molecular biology, ecology, and taxonomy of microorganisms.

Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 311 L. General Microbiology Laboratory**2 Credits (4P)**

Microbiology techniques and procedures, including isolation and identification of microorganisms and biotechnology procedures that employ microorganisms.

Prerequisite(s)/Corequisite(s): BIOL 2320 or BIOL 311. Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 312. Plant Taxonomy**3 Credits (2+3P)**

Classification and identification of representative plant families and local plants. Emphasis on ability to use technical sources. Saturday field trips may be recommended.

Prerequisite(s): BIOL 2610G and MATH 1220G.

BIOL 313. Structure and Function of Plants**3 Credits (2+3P)**

Structure, function, and survey of plants. BIOL 2110G recommended.

Prerequisite(s): BIOL 2610G, MATH 1220G, and sophomore-level standing.

BIOL 314. Plant Physiology**3 Credits (3)**

Photosynthesis, respiration, water relation of plants, minerals and organic nutrition, growth and development.

Prerequisite(s): BIOL 2110G and CHEM 1225G.

BIOL 322. Zoology**3 Credits (2+3P)**

Structure, function, and survey of animals. BIOL 2110G recommended.

Prerequisite(s): BIOL 2610G, MATH 1220G, and at least sophomore-level standing.

BIOL 350. Special Topics**1-4 Credits**

Specific subjects announced in Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 351. Biology Internship**1-6 Credits**

Substantial off-campus experience in biology selected by student in consultation with regular biology faculty member. Internship must be approved by faculty member. Student will supply mutually agreed upon documentation of internship activities after the internship is completed. May be repeated up to 6 credits. Restricted to: BIOL, MBIO, CEC, GEBT majors. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): 45 college credits, 2.5 or better GPA, consent of instructor.

BIOL 353. Pre-Professional Human Anatomy**4 Credits (4)**

Pre-professional clinically-oriented survey of human anatomy. Designed primarily for pre-nursing majors. Provides comprehensive anatomical training for students planning careers in health and allied health sciences, such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. Suitable as a biology elective.

Concurrent enrollment in BIOL 353 L is recommended but not required. May be repeated up to 4 credits.

Prerequisite(s): BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 353 L. Pre-Professional Human Anatomy Laboratory**1 Credit (3P)**

Laboratory experience in human anatomy using anatomical models and cat dissections. Designed as a learning aid to support and augment BIOL 353 pre-professional Human Anatomy. For students planning careers in health and allied health sciences such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. May be repeated up to 1 credits.

Prerequisite(s)/Corequisite(s): BIOL 353. **Prerequisite(s):** BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 354. Physiology of Humans**3 Credits (3)**

Principles of integrative functions in humans. A systems approach emphasizing tissues, organs, and their regulation.

Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 354 L. Laboratory of Human Physiology**1 Credit (3P)**

Laboratory to accompany BIOL 354.

Prerequisite(s): MATH 1220G and either BIOL 2221, BIOL 381, BIOL 354, or concurrent enrollment in BIOL 354.

BIOL 373. Fungal Biology**3 Credits (3+2P)**

Same as EPWS 372.

Prerequisite: EPWS 310 or BIOL 311 or consent of instructor.

BIOL 377. Cell Biology**3 Credits (3)**

Fundamentals of eukaryotic cell structure, organization, and function. Emphasis on membranes, subcellular organelle systems, cytoskeleton, and cell cycle. Includes basic aspects of molecular biology. May be repeated up to 3 credits. BIOL 2610G recommended.

Prerequisite(s): (BIOL 2110G, BIOL 305 or GENE 315) and MATH 1220G.

BIOL 381. Animal Physiology**3 Credits (3)**

Principles of integrative function in animals, emphasizing tissues, organs, organ systems, and regulation. Includes adaptations of animals to their environments. BIOL 2610G and BIOL 377 recommended.

Prerequisite(s): BIOL 2110G and junior-level standing, MATH 1220G.

BIOL 382. Plant Signalling and Development**3 Credits (3)**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 385. An Introduction to Cancer**3 Credits (3)**

This course will cover 3 areas of cancer research and their interdisciplinary connections: clinical cancer research, epidemiology and public health, and basic cancer research. May be repeated up to 3 credits.

Prerequisite(s): BIOL 305 or GENE 315 or equivalent and MATH 1220G.

BIOL 398. Biology Research Programs**1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 402. Biology Honors Thesis**1-3 Credits (1-3)**

Provides guidance in how to write a scientific paper in the sciences. Students will produce an honors thesis based on previous independent research. Consent of instructor required.

Prerequisite(s): MATH 1220G and consent of instructor.

BIOL 412. Seminar in Microbiology**1 Credit (1)**

Seminar to aid students in assessment and presentation of current topics in microbiology.

Prerequisite(s): BIOL 311, BIOL 311 L, and MATH 1220G.

BIOL 417. Topics in Environmental Microbiology**3 Credits (3)**

This is an advanced undergraduate course based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA, and the human microbiome. Crosslisted with: BIOL 577.

Prerequisite(s): MATH 1220G, BIOL 477 or consent of instructor.

BIOL 424. Human Osteology**3 Credits (3)**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Students are recommended to take ANTH 355 or an equivalent before enrolling in this course. BIOL 424L should be taken concurrently when it is offered. Crosslisted with: ANTH 474.

BIOL 427. Symbiosis**3 Credits (3)**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 527.

Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 436. Disease Vector Biology**3 Credits (3)**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Crosslisted with: BIOL 536

Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 442. Genomics Technology**3 Credits (3)**

The course introduces current genomic techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Crosslisted with: BIOL 562.

Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 446. Bioinformatics and NCBI Database**3 Credits (3)**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study.

Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 450. Special Topics**1-3 Credits**

Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 451. Physiology of Microorganisms**3 Credits (3)**

Aspects of cellular physiology unique to prokaryotes. BCHE 395 recommended.

Prerequisite(s): C- or better in BIOL 311, MATH 1220G.

BIOL 455. Biometry**3 Credits (3)**

Biometry is the analysis of biological data using mathematical and statistical models. The course will cover basic theories of probability and statistics and will introduce principles of sampling, estimation, experimental design, and hypothesis testing. Students will analyze biological data using computer programs and will perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.

Prerequisite(s): BIOL 2310G or BIOL 2110G, and MATH 1220G.

BIOL 459. Darwinism Versus Creationism**3 Credits (3)**

This course examines the debate regarding Creationism versus Darwinism as explanations for the origin and diversification of life on Earth. Topics covered include the nature and philosophy of science, new-world creationism, old-world creationism, intelligent design, history of evolutionary thought, modern evolutionary theory, and the Creationism-Darwinism debate at the societal, political, and educational interfaces. The course structure will include formal lectures and in-class discussion of assigned readings.

Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 459 H. Darwinism versus Creationism Honors**3 Credits (3)**

This course will examine the history and philosophy surrounding the debate between Darwinism and Creationism. The course will also examine the consequences of the debate at the interface of sociology, economics, politics, and education. The Honors version of the course (BIOL 459H) will require a term paper in addition to the requirements of BIOL 459. Crosslisted with: BIOL 459.

Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 462. Conservation Biology**3 Credits (3)**

Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally.

Prerequisite(s): BIOL 301 and either MATH 1430G or MATH 1511G.

BIOL 465. Invertebrate Zoology**4 Credits (3+3P)**

Survey, ecology, behavior and physiology. BIOL 322 recommended.

Prerequisite(s): MATH 1220G, BIOL 2610G, and junior-level standing.

BIOL 466. Invertebrate Zoology Field Trip**1 Credit (1)**

A one-week field trip for the study of marine invertebrates. Registrants must provide own camping gear. Graded: S/U.

Prerequisite(s): MATH 1220G, BIOL 465 or equivalent (or concurrent enrollment) or consent of instructor.

BIOL 467. Evolution**3 Credits (3)**

Covers theory, historical background, population variation, natural selection, adaptation, speciation.

Prerequisite(s): BIOL 2610G, BIOL 305 or GENE 320, and MATH 1220G.

BIOL 469. Biology of Emerging Infectious Diseases**3 Credits (3)**

This class will investigate the evolutionary and ecological drivers of disease emergence. The effect of emerging diseases on human health will be addressed throughout the class, but the class will also consider the consequences of disease emergence for the health of wildlife and plant populations. Additionally, the class will consider the mechanisms used to control disease emergence and why they succeed or fail.

Prerequisite(s): MATH 1220G, Introductory Genetics (BIOL 305 or equivalent) or consent of the instructor.

BIOL 470. Developmental Biology**3 Credits (3)**

The purpose of this course is to introduce students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and, how changes in development provide the material basis for evolutionary change.

Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 472. Primate Behavior and Ecology**3 Credits (3)**

Survey of the social behavior and ecology of nonhuman primates. Crosslisted with: ANTH 472.

BIOL 473. Ecology of Microorganisms**3 Credits (2+3P)**

The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes.

Prerequisite(s): MATH 1220G, BIOL 311 or consent of instructor.

BIOL 474. Immunology**3 Credits (3)**

Basic concepts of the immune response.

Prerequisite(s): MATH 1220G, BIOL 305, and CHEM 2115 or CHEM 313.

BIOL 475. Virology**3 Credits (3)**

Mechanisms of viral infections of animals and man. BCHE 395 or BIOL 305 are recommended.

Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 476. Soil Microbiology**3 Credits (3)**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land framing, bioremediation, and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as SOIL 476.

BIOL 476 L. Soil Microbiology Laboratory**1 Credit (3P)**

Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as SOIL 476L.

Prerequisite(s)/Corequisite(s): BIOL 476.

BIOL 477. Applied and Environmental Microbiology**4 Credits (4)**

A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology.

Prerequisite(s): MATH 1220G, BIOL 311, and 311 L, or consent of instructor.

BIOL 478. Molecular Biology of Microorganisms**3 Credits (3)**

The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. BIOL 305 and BCHE 395 recommended.

Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 479. Medical Microbiology**3 Credits (3)**

An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease.

Prerequisite(s): MATH 1220G and BIOL 311 required, BIOL 474 recommended.

BIOL 479 L. Medical Microbiology Laboratory**1 Credit (1)**

Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. May be repeated up to 1 credits.

Prerequisite(s)/Corequisite(s): BIOL 479. **Prerequisite(s):** MATH 1220G, BIOL 311, BIOL 311 L.

BIOL 480. Animal Behavior**3 Credits (3)**

A survey of the field of animal behavior. BIOL 322 recommended.

Prerequisite(s): MATH 1220G, BIOL 2610G, and junior-level standing.

BIOL 484. Animal Communication**3 Credits (3+3P)**

An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products. May be repeated up to 3 credits.

Prerequisite: BIOL 2610G or consent of instructor, and MATH 1220G or higher.

Learning Outcomes

1. Describe how animal signals are produced, transmitted, and received in various taxa,
2. Understand how evolutionary, ecological and economic principles help predict how animals will communicate,
3. Describe general patterns of animal communication across a range of social contexts.

BIOL 488. Principles of Conservation Genetics**3 Credits (3)**

Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations.

Prerequisite(s): MATH 1220G and BIOL 305.

BIOL 489. Genetic Aspects of Population Biology**3 Credits (3)**

Basic theory of population genetics and how that theory has guided, and been influenced by, studies of natural populations.

Prerequisite(s): MATH 1220G and BIOL 305 or equivalent.

BIOL 490. Neurobiology**3 Credits (3)**

Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems.

Prerequisite(s): BIOL 2110G, MATH 1430G or equivalent.

BIOL 498. Biology Research Programs**1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 509. Guided Biological Research Lab**3 Credits (3P)**

This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career graduate students wishing an introduction to research practices. Topics will vary with instructor. Crosslisted with: BIOL 309.

BIOL 510. Current Topics in Biology**3 Credits (3)**

Introduction to diverse topics in modern biology, including dynamic areas of current research.

BIOL 514. Plant Physiology**3 Credits (3)**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. May be repeated up to 2 credits.

Prerequisite: BIOL 2110G and CHEM 1225G.

Learning Outcomes

1. Describe how individual plants survive in variable environments.
This means that students will be able to: a. Summarize the chemical and physical bases for major plant processes. b. Explain how major plant processes interact to support plant growth and development. c. Describe the adaptive forms of physiological processes and their underlying anatomical modifications.
2. Predict consequences of environmental change on physiological processes within individual plants.
3. Apply course concepts to real-world scenarios that involve plant function and plant development.
4. Describe experimental approaches used to understand physiological processes within individual plants.

BIOL 520. Molecular Cell Biology**3 Credits (3)**

An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature.

Prerequisite: BIOL 377 or equivalent.

BIOL 527. Symbiosis**3 Credits (3)**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 427.

Prerequisite(s): Graduate status.

BIOL 536. Advanced Disease Vector Biology**3 Credits (3)**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Taught with: BIOL 436.

Prerequisite(s): BIOL 2110G and BIOL 305.

BIOL 540. Science and Ethics**1-3 Credits (1-3)**

Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated up to 4 credits. Crosslisted with: PHIL 540.

BIOL 541. Professional Development Seminar**1-3 Credits**

Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc.

Prerequisite: consent of instructor.

BIOL 550. Special Topics**1-3 Credits**

Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic entomology, or parasitism in animals. May be repeated for unlimited credit.

Prerequisite: consent of instructor, and designation of a specific topic before registration.

BIOL 562. Advanced Genomics Technology**3 Credits (3)**

This course covers current genomics techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: BIOL 442.

BIOL 565. Biology In The K-6 Curriculum**3 Credits (3)**

Linking important biological concepts to the K-6 curriculum and standards. Addressing known content area challenges with effective pedagogical approaches. Aligning content, standards, classroom activities and assessment. Does not fulfill requirements for degrees in biology. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability) 1
11. Describe the benefits of a case study approach to teaching 1
12. Align biology content with specific K-6 (e.g. NGSS) science standards 1
13. Design an instructional case study (complete with teaching notes and assessment) to address specific K-6 science standards

BIOL 566. Advanced Bioinformatics and NCBI Database**3 Credits (3)**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study. Consent of Instructor required.

BIOL 568. Communities and Ecosystems**3 Credits (3)**

Community ecology is an interdisciplinary field that integrates numerous theories, concepts, and methods to study the patterns and dynamics of biotic assemblages. Because biotic groups affect the biogeophysical and biogeochemical processes that govern Earth system functioning, community ecology also plays an increasingly large role in the study of ecosystem ecology, a discipline which seeks to understand the processes governing nutrient and energy flow across the Earth system. This course will explore the theories and methods for study of biodiversity, biogeography, and community assembly, as well as the pathways through which communities exert influence on ecosystem functioning. Topics will also include evolutionary influences on communities, the integration of community ecology into conservation and land management, and community ecology in an era of rapid environmental change.

BIOL 572. Advanced Primate Behavior and Ecology**3 Credits (3)**

Advanced review of non-human primate social behavior and ecology. Crosslisted with: ANTH 572.

BIOL 577. Advanced Topics in Environmental Microbiology**3 Credits (3)**

This course is based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA and the human microbiome.

Prerequisite(s): Consent of instructor.

BIOL 581. Physiology of Animals**3 Credits (3)**

Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. BIOL 2610G, BIOL 377 recommended.

Prerequisite: BIOL 2110G.

BIOL 582. Advanced Plant Signalling and Development**3 Credits (3)**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 587. Behavioral and Evolutionary Ecology**3 Credits (3)**

This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.

BIOL 589. Speciation and Adaptation**1-3 Credits (1-3)**

Examination of the two great themes of evolutionary biology. Begins with an historical overview of perspectives on these evolutionary processes, and then moves through the foundations of modern research to focus on recent advances driven by improvements in theory and technology. Emphasis on synthesis of the primary literature through lectures, discussion, and written assignments.

Learning Outcomes

1. Students will actively participate in discussions focused on both classic foundational texts as well as recent research in this field.
2. Students are expected to lead class discussions on relevant evolution topics.
3. Students will learn to write a literature review paper on a specific topic in the field of evolutionary biology.

BIOL 590. Neuroscience**1-3 Credits**

Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. May be repeated up to 9 credits.

BIOL 598. Special Research Programs**1-9 Credits**

Individual investigations either analytical or experimental.

BIOL 599. Master's Thesis**15 Credits**

Thesis.

BIOL 600. Doctoral Research**1-15 Credits**

Research.

BIOL 610. Seminar**1-3 Credits (1-3)**

Oral presentation and discussion of journal articles and ongoing research projects. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

BIOL 612. Microbiology Seminar**1 Credit (1)**

Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.

BIOL 697. University Teaching Experience**1-3 Credits**

Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

BIOL 698. Selected Topics**1-3 Credits**

Selected topics for doctoral students.

BIOL 700. Doctoral Dissertation**15 Credits**

Dissertation.

Genetics Courses

GENE 1110. Experimental Systems in Genetics**1 Credit (1)**

Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.

Learning Outcomes

1. To give the students a historical perspective on the field of genetics.
2. To familiarize the students to introductory concepts and vocabulary to the field of genetics.
3. Introduce experimental systems within the field of genetics and to give perspective to current genetic research.
4. As this course is designed for beginning students as an overview of faculty and research labs on campus. The students majoring in genetics are encouraged to meet with faculty and to explore opportunities available to them on campus

GENE 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

GENE 305 L. Genetic Techniques**1 Credit (3P)**

Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics.

Prerequisite(s)/Corequisite(s): GENE 315, or AGRO/ANSC/BIOL/HORT 305.

GENE 315. Molecular Genetics**3 Credits (3)**

Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics. Recommend CHEM 313.

Prerequisite(s): CHEM 1225G and BIOL 2110G.

GENE 320. Hereditary and Population Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.

Prerequisite(s): CHEM 1215G & BIOL 2110G.

GENE 391. Genetics Internship**1-6 Credits (1-6)**

Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

GENE 440. Genetics Seminar**1 Credit (1)**

Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology. Consent of instructor required.

Prerequisite(s): Seniors only; GENE 315 & GENE 320.

GENE 449. Special Problems**1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

GENE 450. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

GENE 452. Applied Bioinformatics**3 Credits (3)**

Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.

GENE 486. Genes and Genomes**3 Credits (3)**

Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

GENE 488. Gene Regulation**3 Credits (3)**

Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315.

Name: Biology Department

Office Location: Foster Hall room 275

Phone: (575) 646-3611

Website: <http://bio.nmsu.edu/> (<http://bio.nmsu.edu/>)

Biology - Bachelor of Arts

The Bachelor of Arts curriculum is intended for students who desire a broad education with emphasis in biology in a program chosen by the student in consultation with an academic advisor. The Bachelor of Arts is recommended for those who plan to teach at the primary levels or to use a background in life science in business or other endeavors.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ²		3-4
MATH 1430G	Applications of Calculus I	
or MATH 1511G	Calculus and Analytic Geometry I	

<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences course (3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	4
Viewing a Wider World ³		6
Departmental Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 377	Cell Biology	3
BIOL 467	Evolution	3
<i>Biology Electives</i>		12
Select sufficient upper-division biology electives to bring total upper-division credits to 24. ⁴		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Organic Chemistry Requirement</i>		4-8
CHEM 2115	Survey of Organic Chemistry and Laboratory	
OR		
CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
Select 3-4 credits from one of the following departments: astronomy, computer science, geology or physics		3-4
Second Language Requirement (See below)		0-8
The number of credits required to satisfy this requirement will vary depending on the option a student chooses.		
Electives, to bring the total credits to 120 ⁵		31-45
Selective sufficient electives to bring the total to 120, including at least 48 upper-division credits.		
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need prerequisite courses before entering one of these.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Choice of Biology electives should be done in consultation with an advisor.

⁵ Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

Second Language Requirement

For the Bachelor of Arts in Biology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4
<i>OR</i>		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
MATH 1220G	College Algebra ¹	3
ENGL 1110G	Composition I ¹	4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	4
Area IV: Social and Behavioral Science Course ²		3
Elective Course		3
Credits		17

Semester 2		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
CHEM 1121	General Supplemental Instruction I	1
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I ¹	
MATH 1511G	Calculus and Analytic Geometry I	
Choose from one of the following Area I Oral Communication General Education Courses:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Credits		15-16

Second Year

Semester 1		
ENGL 2210G	Professional & Technical Communication	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
CHEM 1122	General Supplemental Instruction II	1
BIOL 305	Principles of Genetics ¹	3

Elective Course ³	4
Credits	15
Semester 2	
BIOL 377 Cell Biology ¹	3
First Course in Second Language Series	3-4
Upper-division Biology Elective Course ¹	3
Area VI: Creative and Fine Arts Course ²	3
Area V: Humanities Course ²	3
Credits	15-16
Third Year	
Semester 1	
CHEM 313 Organic Chemistry I ¹	3
CHEM 303 Organic Supplemental Instruction I	1
Upper-division Biology Elective Course ¹	3
Next Second Language Course in Series ¹	3-4
VWW: Viewing a Wider World Course ⁴	3
Elective Course ³	2
Credits	15-16
Semester 2	
CHEM 314 Organic Chemistry II	3
CHEM 315 Organic Chemistry Laboratory	2
Upper-division Biology Elective Course ¹	3
Science Elective Course with prefix ASTR, C S, GEOL or PHYS	4
Elective Course ³	3
Credits	15
Fourth Year	
Semester 1	
BIOL 301 Principles of Ecology ¹	3
Upper-division Biology Elective Course ¹	3
VWW: Viewing a Wider World Course ⁴	3
Upper-division Elective Course ³	3
Upper-division Elective Course ³	3
Credits	15
Semester 2	
BIOL 467 Evolution	3
Upper-division Elective Course ¹	3
Elective Course ³	4
Elective Course ³	3
Credits	13
Total Credits	120-123

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Biology - Bachelor of Science

The major in biology provides a solid academic base for those planning to enter any of the various fields of the biological sciences. The program allows considerable latitude. Degree plans for specific areas of interest can be obtained from the Biology Success Center (<http://bio.nmsu.edu/success/>) in Foster Hall room 204.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
PHYS 2230G	General Physics for Life Science I	
or PHYS 1230G	Algebra-Based Physics I	
PHYS 2230L	Laboratory to General Physics for Life Science I	
or PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 2240G	General Physics for Life Science II	
or PHYS 1240G	Algebra-Based Physics II	
PHYS 2240L	Laboratory to General Physics for Life Science II	
or PHYS 1240L	Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences course (3 credits) ¹		
<i>Area V: Humanities¹</i>		3
<i>Area VI: Creative and Fine Arts¹</i>		3
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and	4
& BIOL 2610L	Evolution	
	and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	
Viewing a Wider World³		6
Departmental/College Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 377	Cell Biology	3
BIOL 455	Biometry ⁴	3
or A ST 311	Statistical Applications	
BIOL 467	Evolution	3
Select sufficient upper-division biology electives to bring total upper-division credits to 28. ⁵		18

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
<i>Organic Chemistry Requirement</i>		4-8
CHEM 2115	Survey of Organic Chemistry and Laboratory	
OR		
CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	
BCHE 341	Survey of Biochemistry	3-4
or BCHE 395	Biochemistry I	
Second Language Requirement (see below)		0-8
The number of credits required to satisfy this requirement will vary depending on the option a student chooses.		
Electives, to bring the total credits to 120 ⁶		14-27
Select sufficient electives to bring the total to 120 credits, including at least 48 upper-division credits.		
Total Credits		120

¹ See the General Education (p. 220) Section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisite courses needed to enter MATH 1511G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Only BIOL 455 will count as Departmental Requirements, students taking A ST 311 will need 3 more credits of upper-division Biology.

⁵ At least one upper-division course must include a laboratory and/or field experience. The laboratory/field requirement can be satisfied by any BIOL course above the 300 level that includes a laboratory or is a field course—including BIOL 350 Special Topics or BIOL 450 Special Topics.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirement list is the amount needed to bring the total to 120 credits and may vary depending on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

Second Language Requirement

For the Bachelor of Science in Biology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8

GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in

mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
MATH 1220G	College Algebra ¹	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution ¹	3
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	1
ENGL 1110G	Composition I ¹	4
Area IV: Social and Behavioral Science Course ²		3
Elective Course		1
Credits		15

Semester 2

MATH 1250G	Trigonometry & Pre-Calculus ¹	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
CHEM 1121	General Supplemental Instruction I	1
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose from one of the following Area I General Education Courses:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Credits		16

Second Year

Semester 1		Credits
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
CHEM 1122	General Supplemental Instruction II	1
ENGL 2210G	Professional & Technical Communication	3
BIOL 305	Principles of Genetics	3
Credits		15

Semester 2

BIOL 377	Cell Biology ¹	3
Upper-division Biology Elective Course ¹		3
Area V: Humanities Course ²		3
Area VI: Creative and Fine Arts Course ²		3
First Second Language Course in Series		3-4
Credits		15-16

Third Year

Semester 1		Credits
CHEM 313	Organic Chemistry I ¹	3
CHEM 303	Organic Supplemental Instruction I	1
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I ¹	4
Second Second Language Course in Series ¹		3-4
VWW: Viewing a Wider World Course ³		3
Elective Course		1
Credits		15-16

Semester 2

PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ¹	4
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
CHEM 304	Organic Supplemental Instruction II	1
Choose from one of the following:		3
BIOL 455	Biometry ¹	
A ST 311	Statistical Applications ¹	
Upper-division Biology Elective Course ¹		3
Credits		16

Fourth Year

Semester 1		Credits
BCHE 395	Biochemistry I	3
BIOL 301	Principles of Ecology	3
Upper-division Biology Elective Course ¹		3
Upper-division Biology Elective Course ¹		3
VWW: Viewing a Wider World Course ³		3
Credits		15

Semester 2

BIOL 467	Evolution	3
Upper-division Biology Elective Course ¹		3
Upper-division Biology Elective Course ¹		3
Additional Elective Course		4
Credits		13
Total Credits		120-122

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Conservation Ecology - Bachelor in Conservation Ecology

Co-directors of the Program:

Professor, Charles Shuster, Department Head, Biology

Professor, Matthew Gompfer, Department Head, Fish, Wildlife and Conservation Ecology

Professors Bailey, Boecklen, Boeing, Caldwell, Cowley, Desmond, Gompfer, Hanley, Houde, Milligan, Nishiguchi, Roemer, Smith, Wright; **Associate Professors** Cain, James, Mabry; **Assistant Professors** Ferrenberg, Orr

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of our Earth's natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from the Biology; Fish, Wildlife and Conservation Ecology; Geography; and Range Science departments.

The educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The requirements are listed below. In addition, each required course must be passed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		3
ENGL 2210G	Professional & Technical Communication (preferred)	
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		3-4
MATH 1430G	Applications of Calculus I ²	
or MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Choose one from the following (3 credits):		
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
FWCE 1110G	Introduction to Natural Resources Management	4
Viewing a Wider World		3
One VWW course will be met with the 9-credit rule ³		
Major Requirements		

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301 or FWCE 301	Principles of Ecology Wildlife Ecology	3
BIOL 305 or AGRO 305	Principles of Genetics Principles of Genetics	3
BIOL 312 or RGSC 316	Plant Taxonomy Rangeland Plants	3
BIOL 313	Structure and Function of Plants	3
BIOL 322	Zoology	3
BIOL 455 or FWCE 457	Biometry Ecological Biometry	3
BIOL 462	Conservation Biology	3
BIOL 467	Evolution	3
BIOL 488 or BCHE 341	Principles of Conservation Genetics Survey of Biochemistry	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	3
<i>Physiology Requirement</i>		3-4
BIOL 314	Plant Physiology	
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BIOL 381	Animal Physiology	
ANSC 370	Anatomy and Physiology of Farm Animals	
FWCE 432	Environmental Biology of Fishes	
<i>Diversity of Life Requirement</i>		6-8
BIOL 465	Invertebrate Zoology	
BIOL 480	Animal Behavior	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	

Second Language: (not required)**Electives, to bring the total credits to 120⁴** **6-10**

Select additional electives to bring total to 120 credits including 48 upper division credits.⁵

Total Credits **120**

¹ See the General Education (p. 220) Section of the catalog for a full list of courses.

² Either MATH 1430G Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take any prerequisites needed to enter these courses.

³ One Viewing a Wider World (p. 224) course will be satisfied using the 9-hour rule: students with Biology as home department use FWCE courses and students with Fish, Wildlife and Conservation Ecology as home department use BIOL courses.

⁴ Other related courses may include BIOL 436 Disease Vector Biology, BIOL 442 Genomics Technology, BIOL 446 Bioinformatics and NCBI Database, BIOL 469 Biology of Emerging Infectious Diseases, BIOL 489 Genetic Aspects of Population Biology, ECON 337V Natural Resource Economics, GEOG 381 Cartography and Geographic Information Systems, GEOG 481 Fundamentals of Geographic Information Science (GIS), GEOL 1110G Physical Geology, GEOL 424 Soil Chemistry, POLS 378 U.S.-Mexico Border Politics, RGSC 318 Watershed Management, RGSC 325 Rangeland Restoration Ecology, RGSC 452 Vegetation Measurements for Rangeland Assessment.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Conservation Ecology there is no second language requirement for the degree.

Genetics and Biotechnology - Bachelor of Science in Genetics

Codirectors of the Program:

Professor, Charles Shuster, Department Head, Biology

Professor, Rolston St. Hilaire, Department Head, Plant and Environmental Sciences

Professors Bailey, Cramer, Hanley, Houde, Milligan, Nishiguchi, Ray, St. Hilaire, Serrano, C. Shuster, M. Shuster, Smith, Unguez, Zhang; **Associate**

Professors Curtiss, James, Xu **Assistant Professors** Indriolo

Have you ever wondered why your hair or eye color, facial features, or the build of your body resembles that of your parents, grandparents, or other close relatives? What factors are responsible for generating all the variety of colors and shapes of flowers, trees, and different types of animals? If these questions have crossed your mind, then you have been thinking about Genetics; the science of heredity. Genetics is studied at the DNA/gene/genome level (molecular genetics, biotechnology, genomics and bioinformatics), the level of organisms (classical or Mendelian genetics), and within/among populations of individuals (population and quantitative genetics).

One of the most significant scientific accomplishments in history has been the use of genomic technologies to recently identify most human genes, as well as, most genes for a number of other animals, plants, fungi, and bacteria. Geneticists now have tremendous opportunities to use molecular, biochemical, mathematical, and computer science-based (bioinformatics) approaches to investigate how these genes determine observable traits. This information can be used to significantly advance human health and well being, and to meet the food and fiber needs of the world.

A degree in Genetics can provide excellent preparation for careers in academic research and technical support, teaching, agriculture, the biotechnology industry, medicine and health sciences, forensic science, technical writing, and sales or marketing. It is also an excellent background for students wishing to enter a graduate program, medical school, and veterinary school.

Undergraduates in the Genetics program must earn a grade of C- or better to receive credit for Departmental and Non-Departmental required courses. Within the Departmental Required courses, Tier I courses must be taken by all majors, for a total of 31 credit hours*. To accommodate differing interests among students, a series of Tier II courses comprising 9-11 credits are provided. Ethical considerations of genetic based technologies will be infused throughout the curriculum, with a focused course on Science and Ethics in the Tier III portion of the core curriculum.

**Note: This includes BIOL 2610G which also counts as a General Education elective.*

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, other Non-Departmental requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
<i>Area I: Communications</i>		10
	English Composition - Level 1 ¹	
	English Composition - Level 2 ¹	
	Oral Communication ¹	
<i>Area II: Mathematics</i>		
MATH 1521G	Calculus and Analytic Geometry II ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social/Behavioral Sciences (3 credits)¹</i>		
<i>Area V: Humanities¹</i>		3
<i>Area VI: Creative and Fine Arts¹</i>		3
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Tier I Requirement also)	3
Viewing a Wider World³		6
Departmental/College Requirements		
<i>Tier I Requirements</i>		

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 302 or BCHE 424	Molecular Biology Techniques Laboratory Experimental Biochemistry I	3
BIOL 377	Cell Biology	3
BIOL 446 or GENE 452	Bioinformatics and NCBI Database Applied Bioinformatics	3
BIOL 455 or A ST 311	Biometry Statistical Applications	3
BIOL 467	Evolution	3
GENE 1110	Experimental Systems in Genetics	1
GENE 305 L	Genetic Techniques	1
GENE 315	Molecular Genetics	3
GENE 320	Hereditary and Population Genetics	3
GENE 440	Genetics Seminar	1
Tier II Requirements		9-11

Select one course from each of the three following categories.

1. Molecular and Applied Genetics: AGRO 462, ANSC 423, BIOL 442, BIOL 475, BIOL 478, BIOL 488, BIOL 489, GENE 486, GENE 488
2. Physiology: ANSC 421, BIOL 354, BIOL 381, BIOL 385, BIOL 451, BIOL 474, EPWS 314, HORT 471
3. Organism Structure: ANSC 370, BIOL 311, BIOL 313, BIOL 322, BIOL 382, BIOL 465, BIOL 470, BIOL 490, EPWS 302, EPWS 373

Tier III Courses	3
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Select one from the following:

AGRO 303V	Genetics and Society
HNRS 306V	Science, Ethics and Society

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
BCHE 396	Biochemistry II, Lecture and Laboratory	3
PHYS 2230G	General Physics for Life Science I	3
or PHYS 1230G	Algebra-Based Physics I	
PHYS 2240G	General Physics for Life Science II	3
or PHYS 1240G	Algebra-Based Physics II	

Electives, to bring the total credits to 120⁴ **18-20**

Select electives to bring total to 120 credits including 48 upper division credits.

Recommended Electives

BIOL 351	Biology Internship
GENE 391	Genetics Internship
GENE 449	Special Problems
HNRS courses ⁵	

Total Credits **120**

¹ See the General Education Section (p. 220) of the catalog for a full list of courses.

² MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take prerequisite courses before entering MATH 1521G Calculus and Analytic Geometry II.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits

and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

⁵ Students interested in graduating with University Honors should consult with an advisor to select 18 credits of relevant Honors (HNRS) courses.

Second Language Requirement

For the Bachelor of Science in Genetics with a major in Genetics and Biotechnology there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
GENE 1110	Experimental Systems in Genetics	1
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G	Composition I	4
Area IV: Social/Behavioral Science Course ¹		3
Credits		15

Spring		Credits
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
MATH 1220G	College Algebra	3
Area V: Humanities Course ¹		3
Elective		1
Credits		15

Second Year

Fall		Credits
CHEM 313	Organic Chemistry I	3
MATH 1250G	Trigonometry & Pre-Calculus	4
GENE 315	Molecular Genetics	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area I: Oral Communication ¹		3
Credits		16

Spring		Credits
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 1511G	Calculus and Analytic Geometry I	4
GENE 320	Hereditary and Population Genetics	3

Elective Course	3
Credits	15
Third Year	
Fall	
BCHE 395 Biochemistry I	3
MATH 1521G Calculus and Analytic Geometry II	4
PHYS 2230G General Physics for Life Science I	3
Area IV: Creative and Fine Arts	3
Elective	2
Credits	15
Spring	
BIOL 377 Cell Biology	3
BCHE 396 Biochemistry II, Lecture and Laboratory	3
GENE 305 L Genetic Techniques	1
PHYS 2240G General Physics for Life Science II	3
Choose from one of the following:	3
A ST 311 Statistical Applications	
BIOL 455 Biometry	
Elective	2
Credits	15
Fourth Year	
Fall	
BIOL 467 Evolution	3
BIOL 302 Molecular Biology Techniques Laboratory or BCHE 424 or Experimental Biochemistry I	3
Tier II: Organism Structure Course	3-4
Choose from one of the following:	3
BIOL 446 Bioinformatics and NCBI Database	
GENE 452 Applied Bioinformatics	
VWW: Viewing a Wider World Course ²	3
Credits	15-16
Spring	
GENE 440 Genetics Seminar	1
AGRO 303V Genetics and Society	3
Tier II: Molecular and Applied Genetics Course	3
Tier II: Physiology Course	3-4
VWW: Viewing a Wider World Course	3
Elective	1-2
Credits	14-16
Total Credits	120-123

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Microbiology - Bachelor of Science

The major in microbiology provides a solid academic base for those planning to enter any of the various fields of microbiology.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Choose one sequence from the following (4 credits)		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one sequence from the following (4 credits)		
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Area IV: Social/Behavioral Sciences course (3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	4
Viewing A Wider World ³		6
Departmental Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 305	Principles of Genetics	3
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 451 or BIOL 475	Physiology of Microorganisms ⁴ Virology	3
BIOL 455 or A ST 311	Biometry Statistical Applications	3
BIOL 474	Immunology	3
BIOL 478	Molecular Biology of Microorganisms	3
BIOL 479	Medical Microbiology	3
BIOL 479 L	Medical Microbiology Laboratory	1
<i>Microbiology Electives</i>		6
Select six additional credits from the following list to bring total upper-division credits in microbiology to 24: BIOL 412, BIOL 427, BIOL 451, BIOL 469, BIOL 473, BIOL 475, BIOL 476, BIOL 477		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors General Chemistry I Lecture and Laboratory for CHEM Majors	4

CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
Second Language Requirement (see below)		0-8
The number of credits required to satisfy this requirement will vary depending on the option a student chooses.		
Electives, to bring the total credits to 120⁵		18-26
Select sufficient electives to bring total credits to 120 including 48 upper-division credits.		
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take prerequisites courses before entering MATH 1511G.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students may take both BIOL 451 Physiology of Microorganisms and BIOL 475 Virology; the second course will count as a microbiology elective.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirement list is the amount needed to bring the total to 120 credits and may vary depending on the degree. Students may have to take more or less courses on a case-by-case basis and each student should discuss this with their advisor.

Second Language Requirement

For the Bachelor of Science in Microbiology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6

For Heritage Speakers:

SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6
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Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4

OR

Challenge the 1120/1220/2210 level for the following courses:

PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3
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Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	4
Area IV: Social and Behavioral Science Course ²		3
Elective Course		1
Credits		15
Semester 2		
MATH 1250G	Trigonometry & Pre-Calculus ¹	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Credits		15
Second Year		
Semester 1		
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory ¹	5
Credits		16
Semester 2		
BIOL 305	Principles of Genetics ¹	3
CHEM 313	Organic Chemistry I ¹	3
Area V: Humanities Course ²		3
Choose from one of the following:		3
BIOL 455	Biometry ¹	
A ST 311	Statistical Applications ¹	
Initial Second Language Course in series		3
Credits		15
Third Year		
Semester 1		
CHEM 314	Organic Chemistry II ¹	3
CHEM 315	Organic Chemistry Laboratory ¹	2
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I ¹	4
BIOL 474	Immunology	3
Next Second Language Course in series ¹		3
Credits		15
Semester 2		
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ¹	4
BCHE 395	Biochemistry I ¹	3
Upper-division Biology Elective (Microbiology) ¹		3
Area V: Creative and Fine Arts Course ²		3

VWW: Viewing a Wider World Course ³		3
Credits		16
Fourth Year		
Semester 1		
BIOL 478	Molecular Biology of Microorganisms	3
Upper-division Biology Elective (Microbiology) ¹		3
VWW: Viewing a Wider World Course ³		3
Upper-division Elective Course ¹		3
Elective Course		3
Credits		15
Semester 2		
BIOL 479 & 479 L	Medical Microbiology and Medical Microbiology Laboratory ¹	4
Choose from one of the following:		3
BIOL 451	Physiology of Microorganisms ¹	
BIOL 475	Virology ¹	
Upper-division Elective Course ¹		3
Elective Course		3
Credits		13
Total Credits		120

¹ These courses have prerequisites and/or co-requisites and it is the students responsibility for checking and fulfilling all requirements for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Biology - Undergraduate Minor

The courses of the Biology minor represent core biological content, critical for a general view of biology. A student cannot earn a bachelor's degree in Biology and also earn a minor in Biology.

Requirements

A minor in Biology must include 20 credits in Biology, of which at least 9 credits must be numbered 300 and above.

No more than 3 credits of special topics or individual study courses may be applied to the minor. A grade of C- or better must be earned in all courses.

Prefix	Title	Credits
Required Courses		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301 or BIOL 377	Principles of Ecology Cell Biology	3
BIOL 305	Principles of Genetics	3
BIOL 467	Evolution	3
Elective		3

Select any Biology courses to bring the total credits to 20.	
Total Credits	20

Conservation Ecology - Undergraduate Minor

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. A minor in Conservation Ecology must include a minimum of 20 credits in the discipline with 9 of these coming from upper-division courses.

Requirements

Prefix	Title	Credits
Core Curriculum		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 301 or FWCE 301	Principles of Ecology Wildlife Ecology	3
BIOL 462	Conservation Biology	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 402	Seminar in Natural Resource Management	1
Select 6 credits from the following:		6
BIOL 312 or RGSC 316	Plant Taxonomy Rangeland Plants	
BIOL 313	Structure and Function of Plants	
BIOL 322	Zoology	
BIOL 465	Invertebrate Zoology	
BIOL 467	Evolution	
BIOL 480	Animal Behavior	
BIOL 488	Principles of Conservation Genetics	
ECON 384V	Water Resource Economics	
ECON 337V	Natural Resource Economics	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 330	Natural History of the Vertebrates	
FWCE 409	Introduction to Population Ecology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 447	Wildlife Law and Policy	
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Total Credits		20

Genetics and Biotechnology - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
GENE 1110	Experimental Systems in Genetics	1
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
GENE 305 L	Genetic Techniques	1
GENE 452	Applied Bioinformatics	3
Select two from the following:		6
BIOL 305	Principles of Genetics	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
Total Credits		18

Human Biology - Undergraduate Minor

The Human Biology minor is intended to provide academic recognition for students who wish to focus a significant amount of attention on courses that deal with human beings from a wide variety of biological standpoints. Thus, course work may encompass topics representing a range of viewpoints such as biological function, human ecology, human origins, and psychology. Successful completion of this minor will provide students with a valuable interdisciplinary perspective on the human condition. This program consists of a minimum of 18 hours, that includes a minimum of 12 from within the Biology Department and a minimum of 3 outside the department. Successful completion of the minor will be certified by the Biology Department. A grade of C- or better is required of all minor courses.

Requirements

Prefix	Title	Credits
Required Departmental Courses		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Select 3-4 credits from the following: ¹		3-4
BIOL 2221	Human Physiology	
BIOL 353	Pre-Professional Human Anatomy	
BIOL 354	Physiology of Humans	
Additional Courses		
Select sufficient credits to total 18 credits from within and outside Biology department:		11
<i>Within Department</i>		
Select a minimum of 5 credits from the following:		
BIOL 1120G	Human Biology	
BIOL 305	Principles of Genetics	
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	
BIOL 354 L	Laboratory of Human Physiology	
BIOL 385	An Introduction to Cancer	
BIOL 424	Human Osteology	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 490	Neurobiology	
<i>Outside Department</i>		
Select a minimum of 3 credits; maximum 6 credits from the following:		

ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab
ANTH 355	Biological Anthropology
ANTH 357V	Medical Anthropology
ANTH 435	Human Health and Biological Variation
ANTH 436	Evolutionary Medicine
ANTH 458	Fertility, Reproduction and Birth
HNRS 2170G	The Human Mind
HNRS 306V	Science, Ethics and Society
PHLS 3110V	Human Sexuality
PSYC 375	Psychology and the Brain
Total Credits	18-19

¹ Any of BIOL 2221 Human Physiology, BIOL 353 Pre-Professional Human Anatomy, or BIOL 354 Physiology of Humans not taken as a departmental requirement can be taken as one of the departmental elective courses.

Microbiology - Undergraduate Minor

A student cannot earn a bachelor's degree in Microbiology and also earn a minor in Microbiology.

Requirements

Prefix	Title	Credits
Required Courses		
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BCHE 341 or BCHE 395	Survey of Biochemistry Biochemistry I	3-4
Select elective courses from this list to bring the total credits to 20:		12-11
BIOL 412	Seminar in Microbiology	
BIOL 451	Physiology of Microorganisms	
BIOL 473	Ecology of Microorganisms	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 479	Medical Microbiology	
BIOL 479 L	Medical Microbiology Laboratory	
Total Credits		20

Chemistry and Biochemistry Undergraduate Program Information

A degree in chemistry or biochemistry enables a student to pursue a wide variety of careers in: research, production, sales, management and teaching. These degrees are also an excellent preparation for professional studies in medicine, dentistry, forensics, veterinary science, optometry, pharmacology, pharmacy and law.

The NMSU Bachelor of Science Chemistry major is certified by the American Chemical Society (ACS). Graduates who complete the program are also eligible for immediate election to membership in the ACS.

The NMSU Bachelor of Science Biochemistry major is accredited by the American Society of Biochemistry and Molecular Biology (ASBMB). BS

Biochemistry majors are eligible to obtain degree certification through examination.

All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

This department does not have a foreign language requirement for any of its degrees.

Graduate Program Information

The Department of Chemistry and Biochemistry offers programs leading to the MS and Ph.D. degrees in Chemistry in the areas of physical, organic, inorganic, biological, and analytical chemistry. Admission to these programs without deficiency is based on an undergraduate program essentially equivalent to that pursued by a chemistry or biochemistry major at this university. All applying students must submit undergraduate transcripts, a personal statement and CV, and arrange for 3 letters of recommendation. All foreign students from undergraduate programs taught in a language other than English must additionally submit TOEFL or IELTS scores and demonstrate adequate English speaking and writing skills. GRE scores are not required to apply.

The core course work required of students entering with no previous graduate study in chemistry or biochemistry consists of courses exploring the concepts of Energy, Structure, Dynamics, and Measurements as applied to all disciplines of chemistry and biochemistry as well as short courses in Safety, Research Ethics, and Professional Development. Successful completion of a Qualifying Exam taken after the first year of coursework will determine whether a student is qualified to pursue continued study at the M.S. or Ph.D. level. Ph.D. candidates must take at least 6 additional credits of specialized coursework chosen in consultation with the thesis committee while M.S. candidates must take at least 3 additional credits. Ph.D. candidates must successfully complete a Comprehensive Exam in order to be eligible to write and defend a Ph.D. thesis. All students are expected to participate in discussion groups and department colloquia.

Since research is central in both the M.S. and Ph.D. programs, the early selection of a research advisor is encouraged. Students may choose to rotate through up to 3 research labs during their first semester before selecting a research advisor. Financial support is provided to all graduate students during their first year through teaching assistantships. Continued support may be provided through a research or teaching assistantship, depending upon individual laboratory funding. All support is contingent upon satisfactory academic and research performance. In addition, numerous traineeships and fellowships are available to qualified students. Inquiries regarding these opportunities should be directed to the graduate program coordinator.

Degrees for the Department Bachelor Degree(s)

- Biochemistry - Bachelor of Science (p. 524)
- Chemistry - Bachelor of Arts (p. 526)
- Chemistry - Bachelor of Science (p. 529)

Master Degree(s)

- Chemistry - Master of Science (p. 117)

Doctoral Degree(s)

- Chemistry - Doctor of Philosophy (p. 180)

Minors for the Department

- Biochemistry - Undergraduate Minor (p. 530)
- Chemistry - Undergraduate Minor (p. 531)

Shelley Lusetti, Department Head

Professors Arterburn, Lyons; **Associate Professors** Ashley, Houston, Lusetti, Maio, Talipov, Tello-Aburto, Yukl; **Assistant Professors** Baker, Carlisle, Talipov, Vincent-Ruz, Windorff; **College Associate Professor** Dunlavy; **College Assistant Professors** Chinnnasamy, Beltran; **Emeritus Professors** Eiceman, Gopalan, Herndon, Johnson, Kuehn, Lara, Quintana, Rayson, Smirnov

S. Lusetti, Department Head, Ph.D. (Wisconsin–Madison)– biochemistry; enzymology of DNA repair; J. B. Arterburn, Ph.D. (Arizona)– organic chemistry; synthetic medicinal and chemical biology; A. K. Ashley, Ph.D. (Colorado State)– biochemistry and toxicology; DNA replication and repair, cancer; C. A. Baker, Ph.D. (Florida State)– analytical chemistry; separation science, micro- and nanotechnologies for neuroscience and astrobiology; S. M. Carlisle, Ph.D. (Louisville)– biochemistry; bioinformatics, cancer and metabolic disease; K. D. Houston, Ph.D. (Texas- MD Anderson)– biochemistry; molecular mechanisms of hormone action in tumorigenesis; B. A. Lyons, Ph.D. (Cornell)– physical biochemistry; NMR spectroscopic studies of signal transduction pathways in breast cancer; W. A. Maio, Ph.D. (Johns Hopkins)– organic chemistry; total synthesis of marine natural products and explorations of new chemical methods; M. R. Talipov, Ph.D. (Bashkir State)– theoretical physical chemistry; electronic structure calculations, ab initio calculations, density functional theory calculations; R. Tello-Aburto, Ph.D. (Iowa) - medicinal and natural products chemistry, asymmetric organic synthesis; P. Vincent-Ruz, Ph.D. (Pittsburgh) - chemistry education research, equity and justice, quantitative methods; C. J. Windorff, Ph.D. (UC-Irvine)- inorganic chemistry; organometallic f-element and transition metal chemistry, redox chemistry; E. T. Yukl, Ph.D. (Oregon Health and Science)– biochemistry; x-ray crystallography and spectroscopy of bacterial metalloproteins

Biochemistry Courses

BCHE 140. Introduction to Biochemistry

1 Credit (1)

A description of the nature of inquiry in biochemistry, especially with respect to the interaction of chemistry and biology. Both historical development and topics of current interest will be discussed. Graded S/U.

BCHE 241. Introduction to Research in Biochemistry

1-3 Credits

Techniques and procedures of biochemical research. May be repeated for a maximum of 3 credits.

Prerequisites: 8 credits of chemistry and 3.0 GPA in chemistry.

BCHE 341. Survey of Biochemistry

4 Credits (3+3P)

Basic principles of biochemical processes and the structure/function of the major classes of biomolecules, with introductions to metabolism and the central dogma of biochemistry. The chemical and biological properties of major biomolecules (DNA, proteins, May be repeated up to 4 credits.

Prerequisite(s): C- or better in CHEM 2115 or CHEM 314.

BCHE 395. Biochemistry I

3 Credits (3)

Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism.

Prerequisite(s): C or better in CHEM 314.

BCHE 396. Biochemistry II

3 Credits (3)

Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 H.

Prerequisite(s): C or better in BCHE 395.

BCHE 396 H. Biochemistry II Honors, Lecture and Laboratory

4 Credits (2.5+3P)

Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 with additional work required. May be repeated up to 3 credits.

Prerequisite: C- or better in BCHE 395.

Learning Outcomes

1. Recognize the essential biochemical reactions and enzymatic mechanisms required for nucleic acid, amino acid, and fatty acid synthesis.
2. Learn the biochemical reaction mechanisms associated with key elements of the central dogma of molecular biology.
3. Identify the reactions and enzymes required for DNA maintenance and replication, transcription and RNA polymerization, and the translation of mRNA to primary amino acid sequence and protein synthesis.
4. Conduct experiments safely.
5. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation.
6. Obtain relevant DNA sequence information from public databases.
7. Transform and isolate plasmid DNA to be used for cloning procedures.
8. Design DNA specific primers for PCR reactions.
9. Perform restriction digest and ligation reactions. 1
10. Analyze DNA sequence to validate the outcome of recombinant DNA experimentation. 1
11. Demonstrate scientific dissemination skills by attending scientific seminars or review primary literature and provide summary via written or oral presentation.

BCHE 424. Experimental Biochemistry I**3 Credits (1.25+6P)**

Laboratory techniques required for experimentation with recombinant DNA such as nucleic acid isolation and purification, polymerase chain reaction (PCR), sequence analysis, and directed mutagenesis using genetic material from both prokaryotic and eukaryotic organisms.

Prerequisite(s): C- or better in BCHE 395, and BCHE 396 or GENE 315.

Learning Outcomes

1. Conduct experiments safely
2. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation
3. Obtain relevant DNA sequence information for gene of interest from public databases
4. Make buffers and reagents necessary for transforming and isolating plasmid DNA from *E. coli*
5. Transform and isolate plasmid DNA to be used for cloning of gene of interest
6. Design primers for PCR to enrich gene of interest from genomic DNA
7. Analyze DNA sequence and choose appropriate restriction enzymes for cloning gene of interest
8. Design primers for PCR to incorporate restriction sites at the ends of gene of interest
9. Perform restriction digest on plasmid DNA and PCR products 1
10. Perform ligation reaction to combine gene of interest with plasmid DNA 1
11. Analyze sequence of plasmid containing gene of interest to validate the outcome of experimentation

BCHE 425. Experimental Biochemistry**3 Credits (1.25+6P)**

Introduction to fundamental techniques used to explore structure and function of biological macromolecules such as proteins, carbohydrates, lipids, and nucleic acid. Course covers analyzing and reporting experimental data; enzymology; quantitative methods to determine biological molecules; basic principles of electrophoresis, chromatography, and spectroscopic immunochemistry. May be repeated up to 3 credits.

Prerequisite: C- or better in BCHE 395.

Learning Outcomes

1. Understand and implement various methods of protein purification as well as qualitative and quantitative analysis of protein preparations
2. Become proficient in absorbance and fluorescence spectroscopy.
3. Determine ligand binding parameters.
4. Understand and measure enzyme kinetics and inhibition.
5. Perform basic protein crystallization and structure determination.
6. Develop skills in scientific writing and presentation.

BCHE 432. Physical Biochemistry**3 Credits (3)**

This course focuses on modern Biophysical techniques used in protein and nucleic acid research. Topics are covered in some detail at the theoretical level. The course content is delivered entirely by podcast. Podcast contributions are from several different faculty from within their particular area(s) of expertise. Topics covered include (but are not limited to): biomolecular NMR, atomic force microscopy, light scattering, circular dichroism, ultracentrifugation, isothermal titration calorimetry, positron emission tomography, computerized tomography, ultrasound, functional MRI, protein fluorescence, mass spec/ proteomics, protein molecular dynamics simulations, and X-ray diffraction. Course credit qualifies for minor degree in chemistry as a physical-analytical chemistry emphasis. CHEM 431, or CHEM 433.

Prerequisite(s): One semester of undergraduate physical chemistry, e.g.

BCHE 440. Biochemistry Seminar**1 Credit (1)**

Introduction to current literature in biochemistry and molecular biology. Selected topics in the field will be presented by the faculty. Students will present written and oral reports from literature searches. Restricted to: BCHE majors.

Prerequisite(s): BCHE 395.

BCHE 441. Advanced Research in Biochemistry**1-3 Credits**

Investigation of biochemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

BCHE 451. Special Topics**1-3 Credits**

Same as CHEM 451. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

BCHE 455. Independent Studies**1-3 Credits**

Independent studies directed by consulting faculty.

Prerequisite: consent of instructor.

BCHE 542. Biochemistry I**3 Credits (3)**

Relationship between macromolecular structure and function. Basic enzymology. Energy metabolism.

Prerequisite(s): CHEM 314 and CHEM 431 or CHEM 433; or BCHE 395 or equivalent.

BCHE 545. Molecular and Biochemical Genetics**3 Credits (3)**

An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology. Same as BIOL 545.

Prerequisite: BCHE 542 or equivalent.

BCHE 546. Biochemistry II**3 Credits (3)**

Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation.

Prerequisite: BCHE 542 or BCHE 395 with consent of instructor.

BCHE 598. Special Research Programs**1-3 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded S/U.

BCHE 599. Master's Thesis**15 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 599.

BCHE 600. Research**1-15 Credits**

May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.

BCHE 647. Physical Biochemistry**3 Credits (3)**

Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 451.

Prerequisite(s): 'C' or better in CHEM 431 or CHEM 433 or BCHE 542.**BCHE 649. Topics in Biochemistry****1-3 Credits**

Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.

BCHE 650. Advanced Seminar**1 Credit (1)**

Discussion of biochemical research in progress that relates to a doctoral candidate's thesis research. Intended for students who have earned a master's degree or the equivalent and has made significant research progress for preparation of the doctoral dissertation. May be repeated for a maximum of 3 credits.

BCHE 700. Doctoral Dissertation**20 Credits**

May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.

Chemistry Courses

CHEM 1111. Basic Chemistry**3 Credits (3)**

For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.

Prerequisite: Enhanced ACT composite score of at least 18 or a grade of C- or better in CCDM 114 N.**Learning Outcomes**

1. The goals and objectives for CHEM 1111 are to equip students with the necessary problem solving skills to be successful in CHEM 1215G/1225G

CHEM 1120G. Introduction to Chemistry Lecture and Laboratory (non majors)**4 Credits (3+3P)**

This course covers qualitative and quantitative areas of non-organic general chemistry for non-science majors and some health professions. Students will learn and apply principles pertaining, but not limited to, atomic and molecular structure, the periodic table, acids and bases, mass relationships, and solutions. The laboratory component introduces students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite: CCDM 114N or A S 103 or MATH 1215 or higher.**Learning Outcomes**

1. (Lecture) Use the different systems of measurements and perform conversions within the same system of measurement and between different systems of measurements
2. (Lecture) Identify elements from their name or symbol, use the periodic table to describe reactivity patterns of elements and to predict compound formation.
3. (Lecture) Describe the basic structure of an atom using subatomic particles, and apply these concepts to nuclear reactions.
4. (Lecture) Describe ion formation and the difference between covalent and ionic compounds. Name and write formulas for ionic and simple molecular compounds.
5. (Lecture) Write and balance chemical reactions. Use balanced reactions in stoichiometric calculations.
6. (Lecture) Describe the differences between the solid, liquid and gas phases. Use the gas laws in calculations, and apply these laws to everyday situations.
7. (Lecture) Explain different types of energy, and how energy is released or absorbed in a reaction
8. (Lecture) Describe acid and base behavior.
9. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result. 1
10. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result 1
11. (Laboratory) Practice concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines. 1
12. (Laboratory) Demonstrate the computational skills needed to perform appropriate laboratory-related calculations to include, but not be limited to determining the number of significant figures in numerical value, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable. 1
13. (Laboratory) Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital). 1
14. (Laboratory) Record quantitatively measured values to the correct number of significant figures and assign the correct units. 1
15. (Laboratory) Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration. 1
16. (Laboratory) Draw appropriate conclusions based on data and analyses. 1
17. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
18. Determine chemical formulas and classify different types of reactions. 1

CHEM 1121. General Supplemental Instruction I**1 Credit (1)**

Collaborative workshop for students in General Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 1215G.

CHEM 1122. General Supplemental Instruction II**1 Credit (1)**

Collaborative workshop for students in General Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 1225G.

CHEM 1123. Principles of Supplemental Instruction III**1 Credit (1)**

Collaborative workshop for students in CHEM 1120G, Principles and Applications of Chemistry. Course does not count toward departmental degree requirements. May be repeated for maximum of 2 credits.

Corequisite(s): CHEM 1120G.

CHEM 1215G. General Chemistry I Lecture and Laboratory for STEM Majors**4 Credits (3+3P)**

This course covers descriptive and theoretical chemistry.

Prerequisite: (1) grade of C- or better in MATH 1215 or higher, or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 1215.

Learning Outcomes

1. Use dimensional analysis, the SI system of units and appropriate significant figures to solve quantitative calculations in science. Understand the differences between physical and chemical changes to matter. Classify types of matter.
2. Understand the scientific method in the context of scientific discoveries.
3. Explain the structure of atoms, isotopes and ions in terms of subatomic particles.
4. Analyze how periodic properties (e.g. electronegativity, atomic and ionic radii, ionization energy, electron affinity, metallic character) and reactivity of elements results from electron configurations of atoms.
5. Understand the creation of different types of compounds (ionic and molecular), comparing and contrasting their structures, naming schemes and formulas. Apply knowledge of electronic structure to determine molecular spatial arrangement and polarity.
6. Understand bulk pure substances, their properties and their states of matter by understanding and identifying intermolecular forces. Apply kinetic molecular theory to relate atomic level behavior to macroscopic properties. Introduce the mole and apply the mole concept to amounts on a macroscopic and a microscopic level
7. Understand mixtures, solubility by considering intermolecular forces and expressing concentration in molarity.
8. Identify different reaction types. Apply the law of conservation of mass to reactions. Perform stoichiometry on balanced reactions. Laboratory Student Learning Outcomes
9. Demonstrate and apply concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
10. Demonstrate the computational skills needed to perform appropriate laboratory related calculations to include, but not be limited to determining the number of significant figures in numerical value with the correct units, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.
11. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
12. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
13. Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration.
14. Draw conclusions based on data and analyses from laboratory experiments.
15. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1216. General Chemistry I Lecture and Laboratory for CHEM Majors**4 Credits (3+3P)**

As the first of a two-semester sequence, this course teaches fundamental concepts in chemistry, including the electronic structure of atoms, chemical periodicity, nature of chemical bonds, molecular structure, the three phases of matter, etc. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): Eligible to take MATH 1250G and an ACT composite score of 22 or higher.

Learning Outcomes

1. Apply the mole concept to amounts at a microscopic level and use this to perform stoichiometric calculations for reactions in solution, gases and thermochemistry.
2. Calculate solution concentrations in various units.
3. Apply the gas laws and kinetic molecular theory to relate atomic level behavior to macroscopic properties.
4. Explain the electronic structure of atoms, isotopes and ions in terms of its subatomic particles.
5. Analyze how periodic properties (e.g. electronegativity, atomic and ionic radii, ionization energy, electron affinity, metallic character) and reactivity of elements results from electronic configurations of atoms.
6. Understand the nature of chemical bonds (ionic and covalent). Apply knowledge of electronic structure to determine molecular structure and polarity.
7. Understand the formation of different phases of matter and the underlying fundamental intermolecular interactions.
8. Describe physical states and changes, and distinguish these from chemical changes.
9. Describe the energy conversions that occur in chemical reactions and state changes, relating heat of reaction to thermodynamic properties such as enthalpy and internal energy; apply these principles to measure and calculate energy changes in reaction.
10. Apply principles of general chemistry to specific real-world problems in environment, engineering and health-related fields.

CHEM 1225G. General Chemistry II Lecture and Laboratory for STEM Majors**4 Credits (3+3P)**

This course is intended to serve as a continuation of general chemistry principles for students enrolled in science, engineering, and certain preprofessional programs. The course includes, but is not limited to a theoretical and quantitative coverage of solutions and their properties, kinetics, chemical equilibrium, acids and bases, entropy and free energy, electrochemistry, and nuclear chemistry. Additional topics may include (as time permits) organic, polymer, atmospheric, and biochemistry. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): C- or better in CHEM 1215G.

Learning Outcomes

1. Explain the intermolecular attractive forces that determine physical properties and phase transitions, and apply this knowledge to qualitatively evaluate these forces from structure and to predict the physical properties that result.
2. Calculate solution concentrations in various units, explain the effects of temperature, pressure and structure on solubility, and describe the colligative properties of solutions, and determine solution concentrations using colligative property values and vice versa.
3. Describe the dynamic nature of chemical equilibrium, and apply LeChatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures as well as describe the equilibrium constant and use it to determine whether equilibrium has been established, and calculate equilibrium constants from equilibrium concentrations and vice versa.
4. Describe the different models of acids and base behavior and the molecular basis for acid strength, as well as apply equilibrium principles to aqueous solutions, including acid/base and solubility reactions, and calculate pH and species concentrations in buffered and unbuffered solutions.
5. Explain titration curves as well as calculate concentrations of reactants.
6. Explain and calculate the thermodynamic functions, enthalpy, entropy and Gibbs free energy, for a chemical system, and relate these functions to equilibrium constants Student Learning Outcomes – Laboratory
7. Demonstrate and apply concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
8. Demonstrate the computational skills needed to perform appropriate laboratory related calculations to include, but not be limited to determining the number of significant figures in numerical value with the correct units, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.
9. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
10. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
11. Perform basic laboratory operations related to, but not limited to, colligative properties of solutions, chemical equilibria, acid/base titrations, electrochemistry.
12. Draw conclusions based on data and analyses from laboratory experiments.
13. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1226. General Chemistry II Lecture and Laboratory for CHEM Majors**4 Credits (3+3P)**

As the second of a two-semester sequence, this course teaches fundamental concepts in chemistry, including solutions, equilibria, electrochemistry, thermodynamics and kinetics. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): C- or better in CHEM 1216.

Learning Outcomes

1. Describe the colligative properties of solutions and explain them using intermolecular forces. Determine solution concentrations using colligative property values and vice versa.
2. Explain rates of reactions, rate laws, and half-life; determine the rate, rate law and rate constant of a reaction and calculate concentration as a function of time and vice versa. Understand the principle of catalysis.
3. Explain the collision model of reaction dynamics, including activation energy, catalysts and temperature; Derive a rate law from a reaction mechanism and evaluate the consistency of a mechanism with a given rate law.
4. Describe the dynamic nature of chemical equilibrium and its relation to reaction rates; apply Le Chatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures.
5. Describe the equilibrium constant and use it to determine whether equilibrium has been established; calculate equilibrium constants from equilibrium concentrations (including pressures) and vice versa.
6. Describe the different models of acids and base behavior, and the molecular basis for acid strength.

CHEM 2111. Explorations in Chemistry**1 Credit (1)**

The major intent of this course is to deepen your interest in chemistry and make you aware of research and career opportunities in the field. During this semester we hope to discuss both old and new developments in chemistry that impact our lives. We also want to build our communication skills that are so necessary in our profession. Graded S/U.

CHEM 2115. Survey of Organic Chemistry and Laboratory
4 Credits (3+3P)

This course is a one-semester survey of organic and biological chemicals. Students will be introduced to nomenclature, molecular structure, properties, and reactions of hydrocarbons, alcohols, carbonyls, organic acids and bases, carbohydrates, lipids, and proteins. The handling of organic chemicals, simple organic reactions, tests for functional groups, and synthesis will be learned in the laboratory component of this course.

Prerequisite: C- or better in CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Identify common organic functional groups.
2. Translate between the IUPAC names and structures of simple organic molecules.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Predict physical and chemical behavior of organic molecules based on structure.
5. Synthesize several classes of organic compounds in the laboratory that were previously studied in the lecture component of this course.
6. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
7. Construct 3 dimensional models of organic compounds.
8. Understand and apply safety principles associated with Organic Chemistry laboratory operations and activities.
9. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
10. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.

CHEM 2120. Integrated Organic Chemistry and Biochemistry
3 Credits (3)

This course is a one- semester introduction to Organic Chemistry and Biochemistry designed for students in health and environmental occupations. The course surveys organic compounds in terms of structure, physical, and chemical properties, followed by coverage of the chemistry of specific classes of organic compounds in the biological environment. Students will apply course concepts to everyday organic and biological chemistry problems in preparation for careers in health and environmental fields.

Prerequisite: CHEM 1120G or CHEM 1215G.

Learning Outcomes

1. Identify and name basic organic compounds.
2. Construct/draw organic compounds from the names.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
5. Compare and contrast the function and location of the four bioorganic units and their macromolecules and cofactors.
6. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.
7. Discuss the pathways and functions of some of the cellular metabolic processes.
8. Recognize and describe metabolic cellular processes and macromolecular structure with respect to health and/or disease state

CHEM 2130. Organic Chemistry I**3 Credits (3)**

This course is the first of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course includes theoretical, qualitative, and quantitative discussion of Organic Chemistry concepts, including but not limited to a review of electronic structure and bonding, acids and bases, stereochemistry, an introduction to organic compounds, isomers, substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols, mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance.

Prerequisite: CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Review properties of elements and molecules discussed in general chemistry (electronegativity, bonding, formal charge, octet rule).
2. Review chemical reactions discussed in general chemistry (products, reactants, balanced equations, byproducts).
3. Classify organic compounds and their properties by functional group, including substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols.
4. Use common and IUPAC rules of nomenclature to name organic compounds.
5. Review the structure and stability of compounds.
6. Comprehend the relationship between structure and reactivity.
7. Comprehend configurations of organic compounds (resonance structures, stereochemistry, isomers).
8. Interpret spectral properties and use in structure determination.
9. Correctly describe the four-five step synthesis of a simple organic molecule using reactions learned in the class.

CHEM 2135. Organic Chemistry II**3 Credits (3)**

This course is the second of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course will emphasize structure, main physical properties, chemical reactivity, and reaction mechanisms relating to alcohols, arenes and carbonyl compounds, as well as continued integration of mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance technique and analysis.

Prerequisite: CHEM 2130 or CHEM 313.

Learning Outcomes

1. Identify functional groups and other key features of different organic compounds.
2. Correctly name organic compounds using the proper nomenclature (IUPAC and common names).
3. Analyze relationships among molecular structure, chemical reactivity, physical and spectral properties.
4. Understand chemical reactivity and reaction mechanisms relating, but not limited to dienes, arenes, alcohols, ethers, amines, phenols, and carbonyl compounds, i.e. aldehydes, ketones, carboxylic acids and derivatives.
5. Write out correctly the mechanisms of electrophilic aromatic substitution, formation and hydrolysis of acetals and ketals, formation and hydrolysis of imines and enamines, conjugate addition of nucleophiles to α,β -unsaturated carbonyl compounds, Fischer esterification and hydrolysis of esters under both acidic and basic conditions, transesterification under acidic and basic conditions, amide hydrolysis under acidic and basic conditions, the aldol reaction and condensation, and the Claisen condensation/Dieckmann cyclization for examples that are different than those studied in class.
6. Relate structures to spectral properties, interpreting IR, thirteenC and oneH NMR.
7. Describe the six-seven step synthesis of a simple organic molecule using reactions learned in this class.
8. Convert the Fischer projection of a carbohydrate to its corresponding Haworth projection, or convert the Haworth projection of a carbohydrate to its Fischer projection.
9. Recognize derivatives of carbonic and phosphoric acids, alkaloids, carbohydrates, peptides, steroids, prostaglandins, aglycones, carbohydrate anomers, reducing sugars, waxes, fats, and oils.

CHEM 2991. Introduction to Research**1-3 Credits (3+9P)**

Techniques and procedures of chemical research. May be repeated for a maximum of 3 credits.

Prerequisites: 8 credits of chemistry and a 3.0 GPA in chemistry.

Learning Outcomes

1. Varies

CHEM 2996. Special Topics in Chemistry**1-6 Credits (1-6)**

Specific subjects in Chemistry. These subjects will be announced in the 'Schedule of Classes'. It may be repeated under different topics for a maximum of 12 credits.

Learning Outcomes

1. Varies

CHEM 303. Organic Supplemental Instruction I**1 Credit (1)**

Collaborative workshop for students in Organic Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 313.

CHEM 304. Organic Supplemental Instruction II**1 Credit (1)**

Collaborative workshop for students in Organic Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 314.

CHEM 313. Organic Chemistry I**3 Credits (3)**

Nomenclature, uses, basic reactions, and preparation methods of the most important classes of aliphatic and aromatic compounds.

Prerequisite(s): C- or better in CHEM 1225G or CHEM 1226.

CHEM 314. Organic Chemistry II**3 Credits (3)**

An in-depth focus on reactions and mechanisms as they relate to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acid derivatives, and amines. May be repeated up to 3 credits.

Prerequisite(s): C- or better in CHEM 313.

Learning Outcomes

1. Identify several new functional groups and other key features of organic compounds
2. Interpret ^1H / ^{13}C NMR, IR, UV-Vis, and Mass spectrometry data and have the ability to correlate structural elements with spectral features
3. Understand the chemical reactivity and reaction mechanisms relating, but not limited, to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acids, and amines. Mechanistic highlights include: etherification, acetal formation / removal, alcohol oxidation, carbonyl addition reactions, enolate (and related) reactions, formation of carboxylic acid derivatives, and nucleophilic acyl substitution processes. Apply these mechanistic and reactivity considerations to these same groups when they appear as substructures in larger biologically-important molecules (e.g. carbohydrates, amino acids, and lipids).
4. Design concise, three to five step syntheses of simple organic molecules using reactions learned in both CHEM 313 and 314
5. Qualitatively assess stability, solubility properties, chemical reactivity, spectral properties, and potential reactions that would lead to preparation, simply via visual inspection of structure.

CHEM 315. Organic Chemistry Laboratory**2 Credits (6P)**

Techniques, preparative and analytical methods in organic chemistry. May be repeated up to 2 credits.

Prerequisite(s)/Corequisite(s): CHEM 314. **Prerequisite(s):** C- or better in CHEM 313 or consent of instructor.

CHEM 351. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

CHEM 357. Synthetic Inorganic Laboratory**2 Credits (6P)**

Explores synthesis and analysis of main group and transition metal inorganic compounds. Inorganic laboratory and spectroscopic techniques will be used.

Prerequisites: CHEM 356.

CHEM 371. Analytical Chemistry**4 Credits (2+6P)**

The fundamentals of quantitative chemical analysis.

Prerequisite(s): C- or better in CHEM 1225G or CHEM 1226.

CHEM 422. Environmental Chemistry**3 Credits (3)**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: ENVS 422

Prerequisite(s): CHEM 1225G and either CHEM 2115 or CHEM 313.

CHEM 424. Soil Chemistry**3 Credits (3)**

Same as SOIL/GEOL 424.

CHEM 430. Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy**3 Credits (3)**

Lecture course covering the basic four areas of Physical Chemistry at the advanced undergraduate level. Topics include: Statistical Mechanics, Thermodynamics, Kinetics, Quantum Chemistry, Group Theory, and Spectroscopy at the advanced undergraduate level.

Prerequisite: CHEM 1225G or 1226; MATH 1521G or higher; PHYS 2140 or PHYS 1320G.

Learning Outcomes

1. Students will master the theoretical basis and underlying laws governing Physical Chemistry (Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy) at the advanced undergraduate level of expertise. In particular, students will develop critical thinking and problem solving skills in the above four areas of Physical Chemistry.

CHEM 431. Physical Chemistry**3 Credits (3)**

Principles that govern the physical and chemical behavior of matter. May not be counted toward Bachelor of Science degree in Chemistry.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G; PHYS 1240G or PHYS 2240G or PHYS 2140 or PHYS 1320G.

CHEM 431 H. Physical Chemistry Honors**3 Credits (3)**

Same as CHEM 431. Additional work to be arranged.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G or MATH 1521H; PHYS 1240G or PHYS 2240G or PHYS 2140 or PHYS 1320G.

CHEM 433. Physical Chemistry I**3 Credits (3)**

Laws and theories underlying chemical phenomena.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G; PHYS 2140 or PHYS 1320G, or consent of instructor.

CHEM 433 H. Physical Chemistry I Honors**3 Credits (3)**

Same as CHEM 433. Additional work to be arranged.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G or MATH 1521H; PHYS 2140 or PHYS 1320G, or consent of instructor.

CHEM 434. Physical Chemistry II**3 Credits (3)**

Laws and theories underlying chemical phenomena.

Prerequisite: CHME 302 or CHEM 433.**CHEM 435. Physical Chemistry Laboratory****2 Credits (6P)****Prerequisite:** concurrent registration in CHEM 434.**CHEM 441. Advanced Research****1-3 Credits (3+9P)**

Investigation of chemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.**CHEM 443. Senior Seminar****1 Credit (1)**

Discussions of current chemical research, impact of chemistry on society and/or ethics as applied to chemists. Each student will present a written and an oral report on an approved topic.

Prerequisite: CHEM 431 or CHEM 433.**CHEM 451. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.**CHEM 455. Independent Studies****1-3 Credits**

Independent studies directed by consulting faculty.

Prerequisite: consent of instructor.**CHEM 456. Inorganic Structure and Bonding****3 Credits (3)**

Study of structure and bonding of inorganic elements with a focus on transition metals. An introduction to symmetry, group theory, and spectroscopy will be included. May be repeated up to 3 credits.

Prerequisite: (MATH 1521G or MATH 1521H) and C- or better in CHEM 314.**Learning Outcomes**

1. Students will learn about inorganic coordination complexes with a focus on transition metals, and may include the main group and f-elements. Students will learn about inorganic nomenclature and to analyze complexes using Lewis acid-base concepts.
2. Students will learn bonding theories, including group theory and symmetry point groups. Students will learn introductory concepts in organometallic chemistry and electronic spectroscopy.

CHEM 471. Advanced Integrated Inorganic and Physical Chemistry Laboratory**3 Credits (9P)**

Laboratory course covering Inorganic and Physical Chemistry techniques at the advanced undergraduate level. Topics may include: Transition metal/Main group synthesis in air and air free environments, Period f-element synthesis, UV-Vis spectroscopy, FT-IR spectroscopy, NMR spectroscopy, Isothermal Titration Calorimetry.

Prerequisite/Corequisite: CHEM 430 and CHEM 315.**Learning Outcomes**

1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 472. Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory**3 Credits (9P)**

Laboratory course covering Protein Biochemistry and Instrumental Analysis techniques at the advanced undergraduate level. Topics may include: Affinity-based protein purification, basic protein quantification, protein activity assay, multi-variant analysis, diode array UV/VIS spectroscopy, ICP-MS, absorption and emission spectroscopy, raman spectroscopy, fluorescence, and separation science (HPLC, GCMS).

Includes data analysis lab.

Prerequisite: CHEM 371.**Learning Outcomes**

1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 475. Central Concepts in Chemistry - Safety**1 Credit (1)**

Students will obtain university safety training plus departmental-specific safety guidelines for the research laboratory

Learning Outcomes

1. Students completing this course will be knowledgeable of all safety guidelines delineated by the University, College, and Department.
2. When possible accident case-studies will be incorporated within the curriculum.

CHEM 476. Central Concepts in Chemistry - Research Ethics**1 Credit (1)**

Students will complete Federal Agency (NSF, NIH, etc.) on-line training modules in responsible conduct in research and discuss relevant case-studies of research misconduct.

Learning Outcomes

1. Completion of this class will yield researchers fully aware of federal and professional guidelines regarding the ethical conduction and dissemination of data and conclusions.

CHEM 477. Central Concepts in Chemistry - Professional Development**1 Credit (1)**

Students will receive basic instruction in research dissemination strategies (presentations) and career planning.

CHEM 501. Central Concepts in Chemistry - Energy**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical energetics. These topics include: (1) basic thermodynamics concepts, (2) statistical thermodynamics (3) chemical equilibria, and (4) intermolecular interactions.

Learning Outcomes

1. Students completing this course will gain an understanding of chemical thermodynamics and equilibria as they relate to all areas of chemistry.

CHEM 502. Central Concepts in Chemistry - Structure**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) principles of chemical bonding and (2) organic, inorganic and biochemical structure determination.

Learning Outcomes

1. Students completing this course will understand the fundamental components of molecular interactions and their impact on molecular structure and function in all areas of chemistry.
2. In addition, they will learn the theory and practice of physical techniques used to determine molecular structure.

CHEM 503. Central Concepts in Chemistry - Dynamics**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) basic kinetic concepts, (2) fundamental gas phase kinetics (3) organic, inorganic and biochemical reaction mechanisms.

Learning Outcomes

1. Students who successfully complete this course will understand the fundamentals of chemical dynamics: from simple gas or solution phase reaction mechanisms to biomolecular interactions.

CHEM 504. Central Concepts in Chemistry - Measurements**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical measurements. These topics include: (1) spectroscopic, electrochemical and chromatographic techniques, (2) statistical methods of measurement and validation relevant to biomolecules, synthetic polymers and mixtures.

Learning Outcomes

1. The collection of quantitative data is central to all subdisciplines of chemistry.
2. Students completing this course will understand the basic principles of chemical measurements and the uncertainties inherently associated with those measurements.
3. They will also gain knowledge of tools available to minimize those uncertainties in data interpretation.

CHEM 507. Chemistry of the Elements**3 Credits (3)**

Discussion of the reactions and structures of inorganic compounds.

CHEM 510. Graduate Student Seminar**1 Credit (1)**

Research seminar for graduate students in Chemistry. Enrollment required each semester for all graduate students. Masters or Doctoral candidates presenting a research seminar enroll for a letter grade. All other participating students enroll using the S/U grading option.

Learning Outcomes

1. Graduate students will gain experience organizing a research presentation.
2. Graduate students will develop oral presentation skills.

CHEM 514. Organic Structure Determination**1-3 Credits (1-3)**

This course is made up of three independent modules of 1 credit each. May be taught in one, two or three modules. Module 1: Infrared Spectroscopy and Other Spectroscopic Methods, Applications of infrared spectroscopy to the structure determination of organic compounds. Module 2: Mass Spectrometry, Application of mass spectrometry to the structure determination of organic compounds. Module 3: NMR spectroscopy, Applications of NMR spectroscopy to the structure determination of organic compounds. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of module one, students will have a general understanding of the physical basis of infrared spectroscopy and molecular vibrations, be able to describe and use the frequency, shape and intensity of diagnostic absorptions in the IR spectra to correlate with common organic functional groups, recognize the utility of the fingerprint region of an IR spectrum to establish identity of small organic compounds, and integrate IR knowledge with other spectroscopic methods for the structure determination of small organic compounds.
2. By the end of module two, students will understand the basis of mass spectrometry as a tool for structure determination, have a general understanding of the different techniques commonly used for sample ionization, describe fragmentation patterns for common classes of organic compounds: alkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, ethers, amines and carbonyl compounds, use molecular ion and fragmentation pattern information to propose structures of small organic molecules, integrate mass spectrometry knowledge with other spectroscopic methods for the structure determination of small organic compounds.
3. By the end of module three, students will understand the physical basis of the nuclear magnetic resonance experiment and the relationship between nuclear and magnetic properties of atoms, describe and use the concepts of chemical and magnetic equivalence, chemical shift, and anisotropic effects in oneH NMR spectra, use information from homonuclear (oneH-oneH) and heteronuclear (oneH-thirteenC) coupling experiments to propose structures of small organic molecules, use information from twoD-NMR experiments (COSY, HMQC, HMBC, NOESY) to propose structures of small organic molecules including stereochemistry, integrate NMR knowledge with other spectroscopic methods for the structure determination of small organic compounds.

CHEM 515. Modern Organic Chemistry**3 Credits (3)**

Recent developments in synthesis and theoretical principles of organic chemistry.

CHEM 516. Physical Organic Chemistry**3 Credits (3)**

Physical organic chemistry.

CHEM 520. Comprehensive Literature Review Seminar for Graduate Students**1 Credit (1)**

Graduate student presents a literature review on an approved topic. The seminar presentation will include cover new developments of primary significance to the topic based on current research papers and culminate in a testable hypothesis. A passing grade allows the student to take the comprehensive exam.

Learning Outcomes

1. Student will prepare an abstract of their presentation understandable to a broad chemistry/biochemistry audience
2. Student will demonstrate a reasonable understanding of every concept introduced
3. Student will present a well-organized topic leading to a logical hypothesis
4. Student will demonstrate the ability to develop a data-supported hypothesis

CHEM 521. Chemical Instrumentation**3 Credits (2+3P)**

Theory and application of electronic devices to chemical analysis.

CHEM 526. Advanced Analytical Chemistry**3 Credits (3)**

Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.

CHEM 527. Separations**3 Credits (3)**

Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.

CHEM 529. Spectrochemical Analysis**3 Credits (3)**

Fundamentals, instrumentation, and applications of spectrochemical analysis.

CHEM 537. Quantum Chemistry**3 Credits (3)**

Fundamentals of quantum mechanics.

Prerequisite: consent of instructor.

CHEM 538. Chemical Kinetics**3 Credits (3)**

Empirical analysis of rate measurements, collision theory, transition state theory, and chain reactions.

CHEM 598. Special Research Programs**1-3 Credits**

Individual investigations, either analytical or experimental. Graded S/U.

CHEM 599. Master's Thesis**15 Credits**

Thesis preparation.

CHEM 600. Research**1-15 Credits**

Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

CHEM 619. Topics in Organic Chemistry**1-3 Credits**

Selected topics of current interest designated by subtitle.

CHEM 629. Advanced Topics in Analytical Chemistry**3 Credits (3)**

Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.

CHEM 639. Topics in Physical Chemistry**1-3 Credits**

Selected topics of current interest designated by subtitle.

CHEM 700. Doctoral Dissertation**17 Credits**

Dissertation preparation.

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Biochemistry - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication (Recommended)	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication (Recommended)	3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ³	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ³	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World ⁴		6
Departmental/College Requirements		
CHEM 313	Organic Chemistry I	3

CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
BCHE 140	Introduction to Biochemistry	1
BCHE 395	Biochemistry I	3
BCHE 396 H	Biochemistry II Honors, Lecture and Laboratory	4
BCHE 440	Biochemistry Seminar	1
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select two of the following:		6
BCHE 432	Physical Biochemistry	
BCHE 451	Special Topics	
CHEM 451	Special Topics (by petition only)	
CHEM 456	Inorganic Structure and Bonding	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 305 or GENE 320	Principles of Genetics Hereditary and Population Genetics	3
BIOL 377	Cell Biology	3
Select one from the following:		3
PHYS 2110	Mechanics ⁵	
PHYS 1230G	Algebra-Based Physics I	
PHYS 2230G	General Physics for Life Science I	
PHYS 1310G	Calculus -Based Physics I	
Select one from the following:		3
PHYS 2140	Electricity and Magnetism ⁶	
PHYS 1240G	Algebra-Based Physics II	
PHYS 2240G	General Physics for Life Science II	
PHYS 1320G	Calculus -Based Physics II	
Select one from the following:		1
PHYS 2110L	Experimental Mechanics ⁷	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 2230L	Laboratory to General Physics for Life Science I	
PHYS 1310L	Calculus -Based Physics I Lab	
Select one from the following:		1
PHYS 2140L	Electricity & Magnetism Laboratory ⁷	
PHYS 1240L	Algebra-Based Physics II Lab	
PHYS 2240L	Laboratory to General Physics for Life Science II	
PHYS 1320L	Calculus -Based Physics II Lab	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper division.		17
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ³ CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses
- ⁵ PHYS 2110 Mechanics is the recommended Physics I course for B.S. majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus -Based Physics I are acceptable and are recommended in the decreasing order listed.
- ⁶ PHYS 2140 Electricity and Magnetism is the recommended Physics II course for B.S. majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.
- ⁷ Students are strongly encouraged to verify prerequisite/corequisite requirements for Physics labs when schedule planning.

Second Language Requirement

For the Bachelor of Science with a major in Biochemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	4
BCHE 140	Introduction to Biochemistry	1
Area IV: Social and Behavioral Science Course ²		3
Credits		16
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory ¹	4
CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course ²		3
Credits		15

Second Year**Semester 1**

BIOL 305 or GENE 320	Principles of Genetics ¹ or Hereditary and Population Genetics	3
CHEM 313	Organic Chemistry I ¹	3
CHEM 371	Analytical Chemistry	4
Choose from one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ¹	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ¹	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I ¹	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab ¹	
Area VI: Creative and Fine Arts Course ²		3

Credits 17

Semester 2

COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
Choose from one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ¹	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ¹	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ¹	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab ¹	

Credits 15

Third Year**Semester 1**

A ST 311	Statistical Applications ¹	3
BIOL 377	Cell Biology ¹	3
BCHE 395	Biochemistry I ¹	3
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3

3

Credits 15

Semester 2

BCHE 396H		4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory ¹	5
VWW: Viewing a Wider World Course ³		3
Elective Course		3
Elective Course		3

Credits 18

Fourth Year**Semester 1**

BCHE 440	Biochemistry Seminar ¹	1
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3
Elective Course		3
Elective Course		3

Elective Course 2

Credits 12

Semester 2

CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select two of the following:		6
BCHE 432	Physical Biochemistry ⁴	
BCHE 451	Special Topics	
CHEM 456	Inorganic Structure and Bonding	
CHEM 451	Special Topics (by petition)	
VWW: Viewing a Wider World Course ³		3

Credits 12

Total Credits 120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ The BCHE 432 Physical Biochemistry is highly recommended for all Biochemistry majors.

Chemistry - Bachelor of Arts

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The program may be used by students planning extensive study in other areas and requires emphasis in a second field of study. Students may not receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry degree. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ³	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ³	

or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World ³		6
Departmental/College Requirements		
CHEM 2111	Explorations in Chemistry	1
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
Select one from the following:		3
CHEM 456	Inorganic Structure and Bonding	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Additional Chemistry credits ⁵		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Select one from the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ⁶	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Select one from the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ⁷	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Select 18 credits from an Emphasis area ⁹		18
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. ¹⁰		30
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.

⁵ The additional chemistry course can be one 3-credit CHEM course or three 1-credit CHEM courses. BCHE 341 Survey of Biochemistry or BCHE 395 Biochemistry I can also be used to fulfill the additional chemistry course requirement.

⁶ PHYS 2110 Mechanics is the Physics I course recommended for all Chemistry majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus -Based Physics I are acceptable and are recommended in the decreasing order listed.

⁷ PHYS 2140 Electricity and Magnetism is the Physics II course recommended for all Chemistry majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.

⁸ Students are strongly encouraged to check prerequisite/corequisite requirements for Physics labs when schedule planning.

⁹ The Emphasis area is composed of courses outside either chemistry or biochemistry degrees (non-departmental and departmental requirements cannot be used for emphasis area credit). These courses must have a common theme, which complement (whenever possible) principles learned on either chemistry or biochemistry. For example, astronomy and physics courses could be taken as an emphasis area in astrophysics. See a faculty mentor for approval of the courses to be used for an emphasis area. A minimum of 18 credits can be used as an Emphasis area (which could constitute a minor in some cases), but at least nine credits must be upper – division.

¹⁰ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry	1
Area IV: Social and Behavioral Science Course ²		3
Credits		16

Semester 2		
ENGL 2210G	Professional & Technical Communication ¹	3
MATH 1521G	Calculus and Analytic Geometry II ¹	4
CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course ²		3
Credits		14

Second Year

Semester 1		
COMM 1115G	Introduction to Communication	3
CHEM 313	Organic Chemistry I ¹	3
CHEM 371	Analytical Chemistry ¹	4
Select one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ¹	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ¹	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Elective Course		3
Credits		17

Semester 2		
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
Select one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ¹	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ¹	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ¹	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab ¹	
CHEM Emphasis Area Course ³		3
Area VI: Creative and Fine Arts Course ²		3
Credits		15

Third Year

Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
VWW: Viewing a Wider World Course ⁴		3
Elective Course		3
Elective Course		3
Elective Course		2
Credits		14

Semester 2

CHEM Emphasis Area Course ³		3
CHEM Emphasis Area Course ³		3
CHEM Upper-Division Elective Course ¹		3
Elective Course		4
Choose one from the following: ⁵		
CHEM 456	Inorganic Structure and Bonding	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Elective Course (3 credits)		
Credits		13

Fourth Year

Semester 1		
VWW: Viewing a Wider World Course ⁴		3
CHEM Emphasis Area Upper-Division Course ³		3
CHEM Upper-Division Elective Course		3
Upper-Division Elective Course		3
Elective Course		3
Choose one from the following: ⁵		3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory (if CHEM 456 or CHEM 472 was not completed in the previous term)	
Elective Course (3 credits)		
Credits		18
Semester 2		
CHEM 443 Senior Seminar ¹		1
CHEM Emphasis Area Upper-Division Course ³		3
CHEM Emphasis Area Upper-Division Course ³		3
Upper-Division Elective Course		3
Elective Course		3
Credits		13
Total Credits		120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ The Emphasis area is composed of courses outside either chemistry or biochemistry degrees (non-departmental and departmental requirements cannot be used for emphasis area credit). These courses must have a common theme, which complement (whenever possible) principles learned on either chemistry or biochemistry. For example, astronomy and physics courses could be taken as an emphasis area in astrophysics. See a faculty mentor for approval of the courses to be used for an emphasis area. A minimum of 18 credits can be used as an Emphasis area (which could constitute a minor in some cases), but at least nine credits must be upper – division.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Selection course option - Departmental requirement includes a choice of one of the following: CHEM 456 Inorganic Structure and Bonding, CHEM 471 Advanced Integrated Inorganic and Physical Chemistry Laboratory, or CHEM 472 Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory. If the student wishes to now take the CHEM offerings in the specific term they should add

an elective course for 3 credits, however, the student must complete at least one of the above courses.

Chemistry - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
	<i>English Composition - Level 1</i> ¹	
	<i>English Composition - Level 2</i> ¹	
	<i>Oral Communication</i> ¹	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ³	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ³	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World ⁴		6
Departmental/College Requirements		
BCHE 395	Biochemistry I	3-4
or BCHE 341	Survey of Biochemistry	
CHEM 2111	Explorations in Chemistry	1
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
CHEM 456	Inorganic Structure and Bonding	3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Upper division Chemistry Elective ⁵		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4

PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
Select two from the following:		6
MATH 2530G	Calculus III	
MATH 391	Vector Analysis	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 2415	Introduction to Linear Algebra	
PHYS 315	Modern Physics	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. ⁶		31-32
Total Credits		120

Note: Students should work closely with their advisors and review carefully the prerequisites for and the sequential nature of courses required for the Bachelor of Science.

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses
- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ³ CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors is highly recommended for B.S. Chemistry majors and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses
- ⁵ The Upper Division Chemistry elective must be a CHEM course and the requirement can be satisfied by one 3-credit course or three 1-credit courses.
- ⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors ¹	4
CHEM 2111	Explorations in Chemistry	1
Area IV: Social and Behavioral Science Course ²		3
Credits		16
Semester 2		
ENGL 2210G	Professional & Technical Communication	3
MATH 1521G	Calculus and Analytic Geometry II	4
CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors ¹	4
Area V: Humanities Course ²		3
Elective Course		3
Credits		17
Second Year		
Semester 1		
CHEM 313	Organic Chemistry I	3
CHEM 371	Analytical Chemistry	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
Elective Course		3
Elective Course		3
Credits		17
Semester 2		
COMM 1115G	Introduction to Communication	3
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory ¹	5
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ¹	4
Choose from one of the following:		3
MATH 2530G	Calculus III	
MATH 391	Vector Analysis ¹	
MATH 392	Introduction to Ordinary Differential Equations ¹	
Credits		15
Third Year		
Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
Area VI: Creative and Fine Arts Course ²		3
VWW: Viewing a Wider World Course ³		3
Choose one of the following:		3
PHYS 315	Modern Physics	
MATH 2415	Introduction to Linear Algebra	
Credits		12
Semester 2		
CHEM 456	Inorganic Structure and Bonding	3
Upper Division Chemistry Elective Course		3
Elective Course		3
Elective Course		3
Credits		12
Fourth Year		
Semester 1		
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory ¹	3

VWW: Viewing a Wider World Course ³		3
Elective Course ⁴		3
Elective Course ⁴		3
Elective Course ⁴		3
Credits		15
Semester 2		
CHEM 443	Senior Seminar ¹	1
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select one of the following:		3-4
BCHE 341	Survey of Biochemistry	
BCHE 395	Biochemistry I	
Elective Course ⁴		3
Elective Course ⁴		3
Elective Course ⁴		3
Credits		16-17
Total Credits		120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students who need to enroll in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits to meet that requirement.

Biochemistry - Undergraduate Minor

The courses of the Biochemistry minor represent core biochemical content. A student cannot earn a bachelor’s degree in Biochemistry or Chemistry and also earn a minor in Biochemistry. A student cannot earn minors in both Biochemistry and Chemistry.

Prefix	Title	Credits
Required Courses		
BCHE 395	Biochemistry I	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
One additional Upper Division Biochemistry (BCHE) course		1-3
Total Credits		18-20

The following (BCHE) courses do not count towards minor:

Prefix	Title	Credits
BCHE 140	Introduction to Biochemistry	1
BCHE 341	Survey of Biochemistry	4
BCHE 440	Biochemistry Seminar	1

Toxicology and Supplemental Instruction (SI) courses are not accepted.

Courses provisionally allowed:

Prefix	Title	Credits
BCHE 441	Advanced Research in Biochemistry (3 credits maximum)	1-3
BCHE 451	Special Topics (by petition only)	1-3

Chemistry - Undergraduate Minor

The courses of the Chemistry minor represent core chemical content. A student cannot earn a bachelor's degree in Chemistry or Biochemistry and also earn a minor in Chemistry. A student cannot earn minors in both Biochemistry and Chemistry.

Prefix	Title	Credits
Required Courses		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Select one from the following:		4-6
CHEM 313 & CHEM 314	Organic Chemistry I and Organic Chemistry II	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
Additional Courses		
Select sufficient additional upper division CHEM/BCHE credits to bring total credits to at least 18		6
Total Credits		18-20

The following courses do not count towards a minor in Chemistry:

Prefix	Title	Credits
CHEM 1111	Basic Chemistry	3
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
CHEM 2991	Introduction to Research	1-3
CHEM 351	Special Topics	1-3
CHEM 443	Senior Seminar	1
No BCHE courses except BCHE 341 or BCHE 395		
Supplemental instruction (SI) courses are not accepted.		

Courses provisionally allowed:

Prefix	Title	Credits
CHEM 441	Advanced Research (3 credits maximum)	1-3
CHEM 451	Special Topics (by petition only)	1-3

Communication Studies

Undergraduate Program Information

Communication Studies focus on the complex role that human communication plays in everyday life.

The undergraduate program in Communication Studies is designed to enhance students' interpersonal skills, presentation skills, and

critical thinking skills. The successful graduate should be able to work effectively with people, assimilate, organize and analyze information, solve problems, make effective presentations and show potential for leadership. The program prepares students for careers in several professions, such as training and development, public relations, law, advertising and sales, government service, mediation, customer relations, human resources, international service, fundraising, and the ministry.

Graduate Program Information

The Master of Arts in Communication Studies provides students with a social scientific approach to the study of human interaction, using quantitative and qualitative methods. Our curriculum is designed to explore how communication occurs interpersonally, within organizations, our political system, and between and within cultures. Students take courses in interpersonal communication, organizational communication, political communication, and/or cultural communication. All graduate students take courses in communication theory and research methods. In addition, students can take courses in topic areas such as conflict management, small group communication, persuasion, and nonverbal communication.

The program offers a wide variety of courses allowing students an opportunity to select topics pursuant to their special interests. In addition to courses, students have the opportunity to obtain practical experience by participating in professional activities offered by the department; for example, graduate teaching assistantships, research, and colloquia.

Master's Accelerated Program Information

The Master's Accelerated Program is an opportunity for qualified, advanced undergraduate students to begin graduate study while still enrolled as an undergraduate student. Students accepted into the program will be able to take up to 12 credits that can be applied to a Master's degree in Communication Studies at New Mexico State University. This equates to one-third of the required credits to obtain a graduate degree in Communication Studies at NMSU.

For a complete list of the qualifications and courses requirements for the Accelerated program see the Master of Arts in Communication Studies (p. 123) program.

Degrees for the Department

Bachelor Degree(s)

- Communication Studies - Bachelor of Arts (p. 539)
- Communication Studies - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-disorders-ba-online/>)

Master Degree(s)

- Communication Studies (Analysis and Decision-Making) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-studies-analysis-decision-making-ma-online/>)
- Communication Studies (Leadership Communication) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-studies-leadership-communication-ma-online/>)
- Communication Studies - Master of Arts (p. 123)

Minors for the Department

- Communication Studies - Undergraduate Minor (p. 541)

Department Head: Greg G. Armfield, Ph.D.

Professors G. Armfield, J. Flora, A. Hubbell, **Assistant Professor** S. Lee, G. Morales, D. Shi,

Greg G. Armfield, Ph.D. (University of Missouri-Columbia) – communication and sport and organizational communication

Jeanne Flora, Ph.D. (University of Kansas) – family communication and interpersonal communication

Anne Hubbell, Ph.D. (Michigan State University) – health communication and organizational communication

Sangwon Lee, Ph.D. (University of Wisconsin-Madison) – Digital Media Technologies and Political Communication

Gabriela Morales, Ph.D. (University of New Mexico) – Communication and Culture and Health Communication

Duli Shi, Ph.D. (University of Maryland, College Park) – Strategic Communication and Organizational Communication

Communication Studies Courses

COMM 1115G. Introduction to Communication

3 Credits (1+2P)

This survey course introduces the principles of communication in the areas of interpersonal, intercultural, small group, organizational, public speaking, mass, and social media. May be repeated up to 3 credits.

Learning Outcomes

1. Describe basic communication terms, forms and concepts.
2. Identify basic communication research methods and theories.
3. Explain the significance of ethics and diversity in communication processes.
4. Apply various concepts and skills in multiple communication contexts

COMM 1130G. Public Speaking

3 Credits (3)

This course introduces the theory and fundamental principles of public speaking, emphasizing audience analysis, reasoning, the use of evidence, and effective delivery. Students will study principles of communication theory and rhetoric and apply them in the analysis, preparation and presentation of speeches, including informative, persuasive, and impromptu speeches. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate effective speech preparation.
2. Demonstrate effective speech delivery through use of language, nonverbal elements and the creation of presentation aids.
3. Analyze a potential audience and tailor a speech to that audience.
4. Evaluate presentations according to specific criteria.
5. Explain common propaganda techniques and logical fallacies, and identify them in the speeches of others.
6. Recognize diversity and ethical considerations in public speaking.

COMM 2110. Communication Theory

3 Credits (3)

This course provides an exploration of major theories, concepts and methods of research in the study of human communication. May be repeated up to 3 credits.

Learning Outcomes

1. Identify, explain, and illustrate key concepts and principles of the major traditions of communication theory.
2. Analyze practical problems and situations using theories.
3. Integrate research correctly and ethically from credible sources to support the primary purpose of communication.

COMM 2111. Introduction to the Communication Major

1 Credit (1)

This is a one-credit course for new Communication Studies majors. It helps them get acquainted with the department, the department head (professor for this course, the professors, other students, and the department student organizations. It also deals with degree mapping and career mapping and any problems the students are having in their first year. Finally, the students learn about the the Communication Studies discipline and various communication careers they can pursue with their degree. The class meets one day each week for one hour. Restricted to: Communication Studies majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. To give you some knowledge about your major and this department.
2. To help you learn more about the study of human communication in general and we approach it in our various courses.
3. To make you comfortable with the department, its professors and graduate students, as well as staff.
4. To assist you in finding important resources for earning your degree in Communication Studies with a high GPA.
5. To engage you and your concerns in earning your degree.
6. To advise you in ways that match your goals with the department goals.

COMM 2996. Special Topics

1-3 Credits (1-3)

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Define and describe key concepts and principles related to the group study or selected topic as identified by the course subtitle.
2. Apply key concepts and principles related to the group study or selected topic as identified by the course subtitle.

COMM 2997. Independent Study

1-3 Credits (1-3)

Individualized, self-paced projects for students with a special interest in communication topics. Students must be sophomore standing to enroll. May be repeated up to 6 credits.

Prerequisite: COMM 1115G.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student will apply knowledge and understanding of the topic in a final paper or project.

COMM 305. Communication Research Methods**3 Credits (3)**

Introductory course in communication research. Emphasis on how to be an effective consumer of research. May be repeated up to 3 credits.

Learning Outcomes

1. Become an intelligent consumer of research: have the ability to read, comprehend, demonstrate understanding and critically evaluate communication and other research reported in scholarly journals and published documents as well as in the popular press.

COMM 310. Communication Theory and Discovery**3 Credits (3)**

The course explores the nature of communication science, major communication theories, and how communication research is conducted and interpreted.

Learning Outcomes

1. Understand philosophical underpinnings of communication theories and methods
2. Understand the relationship between theory and research methods in the field of communication
3. Apply concepts, theories, and research findings to various contexts outside of the classroom
4. Become an intelligent consumer of research: have the ability to read, comprehend, demonstrate understanding and critically evaluate communication and other research reported in scholarly journals and published documents as well as in the popular press.

COMM 351. Persuasion Theory and Practice**3 Credits (3)**

Training in understanding and applying the principles and techniques of argumentation and persuasion. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and explain key concepts and theories in persuasion
2. Apply concepts, theories, and research findings to various contexts outside of the classroom
3. Create persuasive messages utilizing principles from one or more of the theories covered in class
4. Become a critical consumer of persuasive messages and persuasive campaigns.

COMM 370. Organizational Communication**3 Credits (3)**

Communication strategies and patterns of private and governmental organizations, including research on the communication process. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the organizational theory, concepts, and research discussed in class and their implications for the field of organizational communication.
2. Explain the role communication plays in each of the organizational communication processes discussed in class.
3. Critically assess communication practices within all types of organizations.
4. Evaluate the ethical issues brought forth in organizational communication

COMM 376. Communication and Culture**3 Credits (3)**

Cultural and intercultural communication theory and behavior, with a concentration on the development of specific communication skills which should facilitate effective intercultural communication. May be repeated up to 3 credits.

Learning Outcomes

1. Define culture and other related concepts.
2. Explain processes of enculturation and acculturation.
3. Apply the concepts to one's own experience.
4. Create new ways of presenting material about culture and communication.

COMM 377. Conflict Management**3 Credits (3)**

Communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the role of communication in conflict and conflict management processes.
2. Analyze the components of conflict that lead to constructive or destructive communication patterns.
3. Evaluate the effectiveness and appropriateness of strategies, methods, and responses that are appropriate to a given conflict situation

COMM 384. Interpersonal Communication**3 Credits (3)**

Theories of interpersonal communication and relational communication including study of relevant models, contexts and constructs. May be repeated up to 3 credits.

Learning Outcomes

1. To define and describe communication and interpersonal communication.
2. To identify and describe concepts and behaviors related to nonverbal, verbal, relational, interpretive, role, self, and goal competence in the context of interpersonal communication.
3. To compare and apply concepts of interpersonal communication competence by reflecting on examples from communication in personal and everyday relationships.
4. To define, apply, and analyze concepts of family communication competence in media portrayals of, and in one's own experience of, family communication.
5. To define, apply, and analyze concepts of romantic communication competence in either a personal romantic relationship or in the example of a couple observed/interviewed.

COMM 425. Small Group Communication**3 Credits (3)**

Principles and methods of modern group discussion with emphasis on the role of the group in problem solving. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of group communication.
2. Become an intelligent consumer of group research literature.
3. Adopt and articulate a clearly developed communication perspective toward group research.
4. Gain an understanding of the within-group phenomena.

COMM 440. Political Communication**3 Credits (3)**

Presidential and congressional campaigns, political persuasion techniques, political advertising, power in language, and media aspects of political information. Ideology, resistance to political manipulation, and dependence of democracies on communication. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication.
3. Become informed and critical consumers of political messages and the news media.

COMM 450. Technologies of Human Communication**3 Credits (3)**

Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies.
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences.
3. Develop the ability to think about social media critically and analytically.
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal.
5. Articulate the benefits and drawbacks of living in a digital world.

COMM 457. Strategic Communication**3 Credits (3)**

This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the role and functions of Strategic Communication in a culturally diverse world.

COMM 460. Deception and Communication**3 Credits (3)**

Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation. May be repeated up to 3 credits.

Learning Outcomes

1. Students will acquire basic knowledge of research on Deception.
2. Students will be able to identify reasons for why people lie.
3. Students will be able to apply the course concepts to real world situations.
4. Students will be able to tell the difference between what is "true" and what is "false" about how we deceive in the popular press and movies/TV.
5. Students will learn about THE two theories in the area of Deception and be able to differentiate between them.

COMM 462. Family Communication**3 Credits (3)**

A communication perspective on traditional and nontraditional family configurations, roles, interaction patterns, and conflict. Includes an examination of media depictions of families and family interaction, as well as current social and political issues related to the family. May be repeated up to 3 credits.

Learning Outcomes

1. To develop a communication perspective on the family as a system.
2. To identify and distinguish between theories of family interaction.
3. To recognize and explain how family communication patterns and processes affect communication between family members.
4. To analyze communication processes that are unique to family subsystems such as romantic, parent-child, sibling, and extended family relationships.
5. To analyze the role of family interaction in the development and course of mental and physical health problems.
6. To analyze theories of family stress and the impact of specific family stressors on family interaction and well-being.
7. To apply theories and concepts to real-life scenarios.

COMM 465. Nonverbal Communication**3 Credits (3)**

Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process. May be repeated up to 3 credits.

Learning Outcomes

1. To analyze nonverbal channels of communication between persons, including channels such as the voice, face, eyes, posture, gestures, space, territory, clothing, paralanguage, and touch.
2. To analyze how nonverbal behaviors collectively communicate functions such as dominance, deception, intimacy, and turn-taking.
3. To analyze individual and social factors affecting the production of nonverbal behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships.
4. To analyze the origins of nonverbal communication, by examining developmental trends, continuities with other animal species, cultural similarities and differences, and physiological bases.
5. To examine applications of nonverbal research and theory to infant development, personality, gender, relational satisfaction, relationship development, culture, aging, and social media.

COMM 470. Leadership Communication**3 Credits (3)**

Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions. May be repeated up to 3 credits.

Learning Outcomes

1. Apply leadership concepts and theories.
2. Analyze leadership philosophies.
3. Identify the fundamental ways leadership is practiced in organizations.
4. Assess your own leadership traits and behaviors.
5. Develop your own personal leadership philosophy.

COMM 471. Sports Communication**3 Credits (3)**

This course provides a senior-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fandom and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 571. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 475. International Communication**3 Credits (3)**

Exploration of the forms and channels of communication is substantially influenced by international cultural and political factors. Covers: global communication technology; news, information, and entertainment flows; and international diplomacy and negotiation. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding of the history of international communications, and the issues and controversies that have appeared.
2. Demonstrate an understanding of the international agencies responsible for the regulation of media, including content, and technologies.

COMM 477. Environmental Communication**3 Credits (3)**

Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment. May be repeated up to 3 credits.

Learning Outcomes

1. Identify ways in which public discourses socially construct relationships between nature and humans
2. Demonstrate an understanding of critical and cultural approaches to environmental communication
3. Identify key issues in environmental conflicts, risk communication, and democratic participation in policy-making
4. Demonstrate an ability to critically evaluate environmental advocacy, deliberation, and public relations

COMM 478. Case Studies in Leadership Communication**3 Credits (3)**

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 479. Ethics & Diversity in Leadership Communication**3 Credits (3)**

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 480. Health Communication**3 Credits (3)**

Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of health communication theories and concepts.
2. Students will be able to apply theories and concepts to a real-world health issue.
3. Students will be able to differentiate among health communication theories and concepts.

COMM 485. International Teaching Assistant Development**3 Credits (3)**

International teaching assistants will receive instruction in communicative skills to enable them to meet their responsibilities at NMSU. Course includes lectures, seminars, video-taped presentations, and tutorial sessions emphasizing pedagogic and presentation skills and styles.

Prerequisite: consent of instructor.

COMM 490. Independent Study**1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students. Students must be in junior standing to enroll. May be repeated up to 6 credits.

Prerequisite: COMM 1115G.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 491. Selected Topics**1-6 Credits (1-6)**

Individual and/or group study of selected topics. To be identified by subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 495. Communication Internship**3 Credits (3)**

Internship opportunity to apply what has been learned to a real-world situation. Students must be in junior standing to enroll. Students must be in Junior or Senior Standing. May be repeated up to 6 credits.

Prerequisite: COMM 370.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 505. Research Methods**3 Credits (3)**

Seminar in the quantitative study of human communication phenomena, research design, and statistical analysis. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the logic of social science research.
2. Compare different research methods (experiment, survey, content analysis, and so on).
3. Develop and write clear hypotheses.
4. Understand how to assess the validity and reliability of measures.
5. Design a survey to test your hypotheses.
6. Use statistical analyses to answer questions in the field of communication.
7. Discuss the limitations of your study and the implications for your conclusions.
8. Become a better consumer of statistics and social science research.

COMM 506. Qualitative Research Methods in Communication**3 Credits (3)**

Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research. May be repeated up to 3 credits.

Learning Outcomes

1. Learn about the nature and application of qualitative research in social and organizational research.
2. Learn to conceptualize qualitative research and to formulate problem statements and research questions.
3. Learn how to design a qualitative research study.
4. Learn about qualitative data collection procedures—observation, interviews, focus group interviews, and collection and use of documents and archival data.
5. Apply research design and data collection skills by undertaking a pilot research study.

COMM 540. Seminar in Political communication**3 Credits (3)**

Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication
3. Become informed and critical consumers of political messages and the news media.

COMM 550. Seminar in Communication Technologies**3 Credits (3)**

Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences
3. Develop the ability to think about social media critically and analytically
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal
5. Articulate the benefits and drawbacks of living in a digital world

COMM 551. Seminar in Persuasion**3 Credits (3)**

Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects. May be repeated up to 3 credits.

Learning Outcomes

1. Become a critical consumer of persuasive messages and persuasive campaigns.
2. Create persuasive messages utilizing principles from one or more of the theories covered in class.
3. Apply concepts, theories, and research findings to various contexts outside of the classroom.

COMM 557. Seminar Strategic Communication**3 Credits (3)**

This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world. Graduate students will be required to fulfill advanced research and presentation requirements. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the role and functions of Strategic Communication in a culturally diverse world.

COMM 562. Seminar in Family Communication**3 Credits (3)**

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. Topics include basic family communication processes, communication in family subsystems, communication during family stress, and the role of family interaction in health and well-being. Students will explore how family relationships are built, maintained, and destroyed by communication as well as the potentially important and long lasting effects of family relationships on individuals.

COMM 565. Seminar in Nonverbal Communication**3 Credits (3)**

This course focuses on human physical behaviors as the basis of communication between persons. This physical behavior includes such variables as the voice, face, eyes, posture, gesture, space, territory, clothing, and touch. The content of the course considers the individual and social factors affecting the production of such behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships. Applications of research and theory in nonverbal communication to infant development, personality, sex differences, marital satisfaction, relationship development, culture, aging, and brain functioning are also studied throughout the course.

COMM 570. Seminar in Organizational Communication**3 Credits (3)**

Communication strategies and patterns of private and governmental organizations, including research on communication systems. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of organizational culture and communication.
2. Become an intelligent consumer of organizational culture.
3. Plan, design, execute, interpret, and/or critically evaluate the conclusions of an original organizational communication research project.
4. Adopt and articulate a clearly developed communication perspective toward organizational research.

COMM 571. Seminar in Sports Communication**3 Credits (3)**

This seminar provides a graduate-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fandom and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 471. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 576. Seminar on Communication and Culture**3 Credits (3)**

Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss the practical application of the study of culture.

COMM 578. Case Studies in Leadership Communication**3 Credits (3)**

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research. COMM 578 is the graduate version of COMM 478. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 579. Ethics & Diversity in Leadership Communication**3 Credits (3)**

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 583. Seminar in Theories of Communication**3 Credits (3)**

The theories covered in this course are intended to provide you with a foundational background for future graduate courses that will explore theoretical and topical areas of study in more depth. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how theories are developed, analyzed, evaluated, and applied.
2. Be able to assess, synthesize, and evaluate communication theories.
3. Gain a broad overview of the field of human communication theory.
4. Appreciate the diversity of theoretical ideas within communication literature.
5. Develop a deeper understanding through the exploration of selected topics.
6. Begin to solidify a theoretical stance of your own that will motivate and guide further studies.

COMM 584. Seminar in Interpersonal Communication**3 Credits (3)**

Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs. May be repeated up to 3 credits.

Learning Outcomes

1. To define interpersonal communication, explore relationship types, and analyze demographic trends in personal relationships
2. To examine the human need for interpersonal relationships, as well as social networks, the development of social skills, and the role of social support
3. To analyze how people develop and communicate their identity within relationships
4. To examine the role of communication in developing and maintaining relationships, with a focus on relational stages, turning points, dialectics, uncertainty, expectations, self-disclosure, affection, intimacy, influence, conflict, power, as well as cultural influences to close relationships.
5. To analyze relational hurt, relational transgressions, relational deterioration, and termination from a communication perspective.
6. To analyze and review current theory and peer-reviewed research in interpersonal communication.
7. To examine practical applications of interpersonal communication that have the potential to help or harm people, and to explore the gaps and links between theory and practice.

COMM 590. Independent Study**1-6 Credits (1-6)**

Individualized, self-paced projects. May be repeated up to 99 credits.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 591. Special Topics**1-9 Credits (1-9)**

Individual and/or group study of special topics. To be identified by subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 595. Communication Internship for Graduate Students**3 Credits (3)**

Internship opportunity to apply what students have learned to the real world. May be repeated up to 3 credits.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 598. MA Project**1-6 Credits (1-6)**

Project credits are used for the master's degree project option. May be repeated up to 6 credits.

Learning Outcomes

1. Propose and defend the project during the first semester.
2. Complete and defend the project during the second semester.

COMM 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Submit Thesis Proposal and defend the first semester of enrollment.
2. Complete Thesis and defend during the second semester of enrollment.

Department Head: Greg G. Armfield, Ph.D.

Department Office: 304 Communication Science

Department Website: <https://comm.nmsu.edu/>

Department Email: COMMStudies@nmsu.edu

Department Phone: (575) 646-2801

Communication Studies - Bachelor of Arts

In addition to completing the general education requirements of the university and the college, students majoring in communication studies are required to complete 21 credits of core COMM courses and 15 credits of COMM electives for a total of 36 credits. Any exception to these policies requires department head approval.

All COMM courses must be completed with a grade of C- or better.

Undergraduate Course Rotation:

Fall

COMM 310 Communication Theory and Discovery

COMM 376 Communication and Culture

COMM 384 Interpersonal Communication

Spring

COMM 351 Persuasion Theory and Practice

COMM 370 Organizational Communication

COMM 495 Communication Internship

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
English Composition - Level 1	¹	4
English Composition - Level 2	¹	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication (Communication Core Course)	3
<i>Area II: Mathematics</i>		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
Area III: Laboratory Sciences Course (4 credits)		¹
Area IV: Social/Behavioral Sciences Course (3 credits)		¹
Either an Area III/IV: Laboratory Science Course or Social/ Behavioral Science Course (4 or 3 credits)		¹
<i>Area V: Humanities</i>		3
<i>Area VI: Creative and Fine Arts</i>		3
<i>General Education Elective</i>		3-4
Viewing a Wider World		² 6
Departmental/College Requirements		
<i>Core Courses</i>		18
The department requires 21 total credits of Core Courses with the classes listed below and COMM 1115G from the General Education requirements		
COMM 310	Communication Theory and Discovery	
COMM 351	Persuasion Theory and Practice	
COMM 370	Organizational Communication	
COMM 376	Communication and Culture	
COMM 384	Interpersonal Communication	
COMM 495	Communication Internship	
<i>Departmental Elective Courses</i>		18
Second Language Requirement: (required- see below)		0-8
Electives to bring total credits to 120		³ 35-46
Total Credits		120

¹ For Information regarding the General Education Course Requirements see the General Education (p. 220) section of the catalog.

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Communication Studies, there is a one-year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110 & SIGN 1120	American Sign Language I and American Sign Language II	3-6

Option 3:

Prefix	Title	Credits
Challenge or complete the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4
<i>OR</i>		
Challenge or complete the 1120/1220/2210 level for the following courses:		
PORT 1120 or SPAN 1220 or SPAN 2210 or SIGN 1120	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III American Sign Language II	3

Option 4:

Participate in an experiential learning study abroad course sponsored by NMSU or an approved International Internship that enhances the students' cultural competency through cultural understanding and experience. Please meet with the head of the Department of Communication Studies for information. Students must pass the course with a C- or higher.

Option 5:

Pass (with a C- or higher) any three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 6:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 7:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 8:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 9:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
Choose one from the following: ¹		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
COMM 1115G	Introduction to Communication	3
MATH 1130G	Survey of Mathematics	3
FYEX 1112	The Freshman Year Experience	3
Choose one from the following: ²		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area IV: Social/Behavioral Science Course ²		3
Area VI: Creative and Fine Arts Course ²		3
Area III: Laboratory Science Course ²		4
Area V: Humanities Course ²		3
Elective Course		1
Credits		30

Sophomore

COMM 310	Communication Theory and Discovery (offered Fall only)	3
COMM 376 or COMM 384	Communication and Culture (offered Fall only) or Interpersonal Communication	3
Area III: Laboratory Science Course OR Area IV: Social/Behavioral Science Course ²		3-4
First Course in Second Language Requirement ²		3-4
Second Course in Second Language Requirements ²		3-4
COMM 351	Persuasion Theory and Practice (offered Spring only)	3
COMM Elective Course		3
Elective Course(s)		9
Credits		30-33

Junior

COMM 384 or COMM 376	Interpersonal Communication (offered Fall only) or Communication and Culture	3
COMM Elective Course(s)		6
VWW - Viewing a Wider World Courses(s) ³		6
COMM 370	Organizational Communication (offered Spring only)	3
Elective Course(s)		9
Upper-Division Elective Course(s)		3
Credits		30

Senior

COMM Elective Course		3
Upper-Division Elective Course(s)		24
COMM 495 (offered Spring only) or COMM Elective Course		3
Credits		30
Total Credits		120-123

¹ These courses may have prerequisites and/or co-requisites, and it is the student's responsibility to fulfill all requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Communication Studies - Undergraduate Minor

A minor in Communication Studies consists of 18 credits; at least 9 of those credits must be in courses numbered 300 or above. All courses must be completed with grades of C- or better.

Prefix	Title	Credits
Required Courses		
COMM 1115G	Introduction to Communication	3
COMM 370	Organizational Communication	3
COMM 376	Communication and Culture	3
COMM 384	Interpersonal Communication	3
Additional Courses		
Select 6 credits of additional Communication Studies courses		6
Total Credits		18

Computer Science

Computer Science is the area of study that encompasses all of the theory and practice of computing. The mission of the Department of Computer Science at New Mexico State University is to provide formal education in the core disciplines of computer science, as well as to prepare our graduates for research, development and academic careers. For more information on the Department of Computer Science, please visit the web site <https://computerscience.nmsu.edu>.

Undergraduate Program Information

The undergraduate computer science programs prepare students for graduate study in computer science and for employment in positions involving the design, construction and application of computer systems. Undergraduate degree programs include a Bachelor of Science (**ABET accredited**), Bachelor of Arts, Bachelor of Science in Cybersecurity, four minor degree tracks, and seven concentrations. The B.S. degree is the traditional computer science degree program, while the B.A. degree offers a more open, flexible degree plan that is easier to combine with studies in other disciplines. The minors are for non-Computer Science majors and offer specialized tracks in algorithm theory, bioinformatics, computer systems and software development. The concentrations are for Computer Science majors and provide a focus on specialized areas such as algorithm theory, artificial intelligence, big data and data science, networking, cybersecurity, human computer interaction, and software development. With technology underpinning almost every area of human endeavor today, students across NMSU should consider pursuing a minor or at least taking some computer science courses. Computer science majors should review their programs of study in consultation with their advisors each semester, preferably using the most recent Undergraduate Catalog.

Graduate Program Information

The department offers both Master of Science and Doctor of Philosophy graduate degrees in computer science, along with a Master of Science in Bioinformatics. We also encourage students in other disciplines to do a graduate minor in computer science. Graduate students typically work closely with a faculty member in a specific area of research. The department offers expertise in several research areas, such as: artificial intelligence and knowledge representation; computer and wireless networks; data mining and machine learning; game design and human-computer interaction; bioinformatics; high performance computing; software engineering and programming languages; theory of computing; and assistive technologies.

A number of laboratories have been established to coordinate research activities, including

- the Knowledge representation, Logic and Advanced Programming (KLAP) lab;
- the Play and Interactive Experiences for Learning (PIxL) lab;
- the Knowledge Discovery and Data Mining (KDD) lab;
- the Programming Languages, Environments, and Automated Software Engineering (PLEASE) lab;
- the Bioinformatics Research lab;
- the Multimedia Management lab;
- the Cryptography, Privacy and Security Research (CrySPR) lab; and
- the Network and Systems Optimization Lab (NSOL).

Department members are also directing the iCREDITS interdisciplinary Center of Research Excellence in Design of Intelligent Technologies for Smartgrids, offering educational and research opportunities in smartgrids.

Entrance Requirements for Graduate Study in Computer Science

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. To be admitted without undergraduate deficiencies, an entering student must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science degree in Computer Science at New Mexico State University; in particular, this includes courses equivalent to

Prefix	Title	Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3

Deficiencies should be satisfied as early in the student graduate program as possible, through the regular undergraduate courses, the C S 460 - C S 468 transition courses, or through tests administered by faculty members in the relevant areas. Students should consult with their Graduate Advisor to address issues related to deficiencies. Deficiencies are also assigned to applicants whose transcripts denote low grades in selected areas. Admission is often denied to candidates with little background in Computer Science. Instructions for prospective applicants can be found at <https://computerscience.nmsu.edu>.

Entrance Requirements for Graduate Study in Bioinformatics

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. Students wishing to enroll in the Master program in Bioinformatics must meet the following criteria:

1. Hold a BS degree, from an accredited institution of higher learning, in either a computational field (e.g., Computer Science) or in life sciences (preferably Biology, Biochemistry, or Environmental Sciences)
2. Hold a minimum grade point average of 3.2

Applicants will be expected to provide a Career statement, motivating the interest in bioinformatics and a minimum of three letters of reference.

Graduate Assistantships

Graduate assistantships (in the form of Teaching and Research assistantships) are expected to be available during the academic year. Inquiries should be addressed to the departmental Graduate Committee. Research assistantships are available at the discretion of individual research project leaders in the Department or elsewhere on campus.

Submitting detailed vitae, letters of reference, and GRE test scores are encouraged when applying for any assistantship.

Degrees for the Department

Bachelor Degree(s) & Dual Degree(s)

- Computer Science (Algorithm Theory) - Bachelor of Science (p. 566)
- Computer Science (Artificial Intelligence) - Bachelor of Science (p. 568)
- Computer Science (Big Data and Data Science) - Bachelor of Science (p. 571)
- Computer Science (Computer Networking) - Bachelor of Science (p. 573)
- Computer Science (Cybersecurity) - Bachelor of Science (p. 576)
- Computer Science (Human Computer Interaction) - Bachelor of Science (p. 578)
- Computer Science (Software Development) - Bachelor of Science (p. 581)
- Computer Science - Bachelor of Arts (p. 561)
- Computer Science - Bachelor of Science (p. 563)
- Computer Science - Bachelor of Science/Master of Science (p. 585)
- Cybersecurity - Bachelor of Science (p. 583)

Master Degree(s)

- Bioinformatics - Master of Science (p. 104)
- Computer Science - Master of Science (p. 124)
- Data Analytics (Digital Agriculture) - Master of Data Analytics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/data-analytics-digital-agriculture-mda-online/>)
- Data Analytics - Master of Data Analytics (p. 126)
- Data Analytics - Master of Data Analytics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/data-analytics-mda-online/>)

Doctoral Degree(s)

- Computer Science - Doctor of Philosophy (p. 181)

Minors for the Department

A student cannot earn more than one of the undergraduate minors unless they pass at least 6 credits in the second minor beyond the requirements of the first minor. The maximum number of undergraduate minors that a student may earn is two. Most courses for the minors listed below have prerequisites. Please check the undergraduate catalog for individual course prerequisites. Students interested in pursuing a computer science minor are encouraged to pick up more information at the departmental office.

- Algorithm Theory - Undergraduate Minor (p. 586)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 213)
- Bioinformatics - Undergraduate Minor (p. 586)
- Computer Science - Graduate Minor (p. 213)
- Computer Systems - Undergraduate Minor (p. 586)
- Software Development - Undergraduate Minor (p. 586)

Faculty

Professor Son Tran, Department Head

Professors Cook, Cao, Pontelli, Misra, Song, Tran; **Associate Professors** Pivkina, Touns; **Assistant Professors** Hamilton, Le, Nagarkar, Reynolds, Vishwanathan, Wang; **College Associate Professor** Cooper

H. Cao, Ph.D. (Hong-Kong)– data mining, databases, data integration, applied machine learning; J. Cook, Ph.D. (Colorado)– software engineering, high performance computing; W. Hamilton, Ph.D. (Texas A&M)– media design, online communities, online education, and video game design/ culture; T. Le, Ph.D. (Singapore Management University, Singapore)– data mining and machine learning, dimensionality reduction, visualization, topic models, embedding and generative models; S. Misra, Ph.D. (Arizona State)– communication networks, social networks, high performance computing, security and privacy; P. Nagarkar, Ph.D. (Arizona State)– query optimization, indexing, data analytics, big data; I. Pivkina, Ph.D. (Kentucky)– artificial intelligence, computer science education, data mining; E. Pontelli, Ph.D. (New Mexico State)– parallel processing, logic programming, knowledge representation, bioinformatics, assistive technologies; J. Reynolds (UIUC)- network and security; M. Song, Ph.D. (Washington)– statistical computing, systems biology, bioinformatics, computer vision; P. Touns Dugas, Ph.D. (Texas A&M)– digital games, human-computer interaction, mixed reality; S. Tran, Department Head, Ph.D. (Texas-El Paso)–artificial intelligence, knowledge representation, planning, logic programming, non-monotonic reasoning; R. Vishwanathan, Ph.D. (North Texas)– cryptography, theoretical and applied, security, privacy; T. Wang, Ph.D. (University of South Florida)– cyber-physical system security, web security, network security.

College Faculty:

S. Cooper, Ph.D. (New Mexico State)– computer networks

Computer Science Courses

C S 111. Computer Science Principles 4 Credits (3+2P)

This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future. May be repeated up to 4 credits.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Identify and differentiate programming constructs like IF, FOR, and WHILE
2. Convert numbers between Hexadecimal, Binary and Decimal
3. Write pseudo code to manipulate a robot
4. Use an ASCII table to translate HEX strings into characters
5. Encrypt and Decrypt simple messages with a Caesar Cypher

C S 117. Introduction to Computer Animation 3 Credits (3)

Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

C S 151. C++ Programming 3 Credits (2+2P)

Introduction to object-oriented programming in the C++ language. The focus will be on preparing students to use C++ in their own areas. No prior programming experience is required. Taught with C S 451.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Use various data types and the corresponding operations.
2. Write C++ programs that contain expressions, program control, functions, arrays, and input/output
3. Explain basic object-oriented programming concepts.
4. Demonstrate proficiency in using classes, inheritance, pointers, streams, and recursion

C S 152. Java Programming 3 Credits (2+2P)

Programming in the Java language. May be repeated up to 3 credits.

Prerequisite(s): MATH 1215 or higher.

C S 153. Python Programming I 3 Credits (3)

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. Taught with C S 453.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Develop an algorithm to solve a problem
2. Demonstrate the ability to use Python data types: int, float, strings, and lists; and the built-in functions associated with those data types
3. Edit and debug programs using the Spyder IDE for Python
4. Implement algorithms using the Python features of assignment, input, output, branches, loops, and functions
5. Explain the fundamental concepts of object-oriented programming with Python
6. Design and implement Python classes based on given attributes and behaviors
7. Work with existing Python modules such as math, random, and os
8. Write Python programs that input data from files and store results in files

C S 154. Python Programming II 3 Credits (3)

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

Prerequisite(s): C S 153 or C S 453.

C S 158. R Programming I 3 Credits (3)

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.

Prerequisite(s): MATH 1220G.

C S 171G. Modern Computing in Practice**4 Credits (3+2P)**

This course provides a survey of practical and theoretical foundations for how computers work and how they support fundamental organizational needs. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Lab assignments provide hands-on applications to use simple basic software tools to write simple programs, build and edit websites, analyze data with spreadsheets, choose an office productivity suite, and demonstrate computer literacy to potential employers. May be repeated up to 4 credits.

Prerequisite: MATH 1130G or MATH 1215 or higher.

Learning Outcomes

1. Students will create simple python programs using conditional statements and loops
2. Students will analyze data with spreadsheet formulas, charts, and tools
3. Students will create and publish a personal website using website building tools
4. Students will edit HTML and CSS to format a website manually
5. Students will practice the skill of performing software QA and providing actionable feedback to developers
6. Students will become aware of common cybersecurity risks
7. Students will learn basic vocabulary and context for broad aspects of hardware, software, and computer science theory such as Security, Privacy, Cloud Computing, the Internet, the Web, Operating Systems, Discrete Math, and Information Systems
8. Students will be exposed to various sub-fields of CS including artificial intelligence, security, data analytics, UX, web development, and QA testing
9. Students will reason about the societal impacts of technology 1
10. Students will incorporate their new knowledge and skills into their resume

C S 172. Computer Science I**4 Credits (3+2P)**

Computational problem solving; problem analysis; implementation of algorithms using Java. Object-oriented concepts, arrays, searching, sorting, and recursion. Taught with C S 460. May be repeated up to 4 credits.

Prerequisite: (A C- or better in either MATH 1250G or (MATH 1430G or higher)) OR (A C- or better in MATH 1220G and a 1 or better in the CS Placement Test) OR (A C- or better in MATH 1220G and a C- or better in C S 111).

Learning Outcomes

1. Develop algorithms to solve problems
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion
3. Apply an understanding of primitive and object data types
4. Design and implement classes based on given attributes and behaviors
5. Explain the fundamental concepts of object-oriented programming,

C S 209. Special Topics.**1-3 Credits**

May be repeated for a maximum of 12 credits.

C S 271. Object Oriented Programming**4 Credits (3+2P)**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Pointers and dynamic memory allocation. Hands-on experience with useful development tools. Taught with C S 462. May be repeated up to 4 credits.

Prerequisite: At least a C- in C S 172 or ENGR 140.

Learning Outcomes

1. Develop an algorithm to solve a problem.
2. Implement algorithms using the C and C++ languages including imperative and object-oriented language features.
3. Beyond what was learned in C S 172, E E 112, or E E 161 demonstrate a noticeable increase in understanding of problem analysis and program design.
4. Demonstrate proficiency in using control structures including if statements (single selection), switch (multiple selection), and loops (repetition).
5. Demonstrate proficiency in using arrays and functions
6. Create UML class and relationship diagrams.
7. Design a class to model a real-world person, place, thing, or event.
8. Use editing and debugging software to create, debug, and test C and C++ programs.
9. Understand the basic terminology used in object-oriented programming. 1
10. Create a make file to build an executable from a set of C or C++ source files.

C S 272. Introduction to Data Structures**4 Credits (3+2P)**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Taught with C S 463.

Prerequisite: At least a C- in C S 172, or placement.

Learning Outcomes

1. Be able to implement and use lists
2. Be able to implement and use stacks
3. Be able to implement and use queues
4. Be able to implement and use trees
5. Be able to perform the run time analysis of basic algorithms using Big O notation
6. Be able to implement, use, and analyze searching algorithms
7. Be able to solve a problem recursively
8. Take a problem statement from a user and convert it into a Java program that fulfills the user's needs
9. Create object oriented Java classes that effectively separate and hide implementation details from client applications

C S 273. Machine Programming and Organization**4 Credits (3+2P)**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Taught with C S 464. May be repeated up to 4 credits.

Prerequisite: At least a C- in C S 172 or ENGR 140.

Learning Outcomes

1. Describe the architecture of a microcontroller, the interconnections between the components, and the basic units inside the CPU
2. Use signed and unsigned numbers, the associated branching instructions, and the corresponding flags in the status register
3. Explain immediate, direct, indirect addressing modes, their opcode and operands, and their utilities
4. Map high-level programming language features to assembly instructions, including loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion
5. Interface with I/O devices including LED and sensors via digital input and output, and analog-to-digital conversion
6. Program timers/counters and interrupts to control real-time applications
7. Design an assembly program

C S 278. Discrete Mathematics for Computer Science**4 Credits (3+2P)**

Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. Taught with C S 465.

Prerequisite: At least C- in C S 172.

Learning Outcomes

1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction
3. Use summations, formulas for the sum of arithmetic and geometric sequences
4. Explain and apply the concepts of sets and functions
5. Apply counting principles to determine the number of various combinatorial configurations

C S 343. Algorithm Design & Implementation**3 Credits (3)**

Introduction to efficient data structure and algorithm design. Basic graph algorithms. Balanced search trees. Classic algorithm design paradigms: divide-and-conquer, greedy scheme, and dynamic programming. Taught with C S 493.

Prerequisite: At least a C- in C S 272, or consent of instructor.

Learning Outcomes

1. Be able to use and implement sorting algorithms
2. Be able to design and implement graph algorithms
3. Be able to design and implement algorithms using the divide-and-conquer technique
4. Be able to design and implement algorithms using the greedy technique
5. Be able to design and implement algorithms using the dynamic programming technique
6. Be able to use and implement balanced search trees
7. Be able to use and implement hashing techniques
8. Be able to perform the run time analysis of basic algorithms using Big O notation

C S 370. Compilers and Automata Theory**4 Credits (3+2P)**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. Taught with C S 466.

Prerequisite: At least a C- in C S 271, C S 272, and C S 273.

Learning Outcomes

1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA
3. Apply recursive descent parsing in programming a parser of a small grammar
4. Understand the ideas in LL and LR parsing of context-free language classes
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence

C S 371. Software Development**4 Credits (3+2P)**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. Taught with C S 468.

Prerequisite: At least a C- in C S 271 and C S 272.

Learning Outcomes

1. Understand and explain the activities and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system
3. Apply high and low level design ideas to create an object-oriented design of a software system
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages
5. Apply white and black box testing techniques and tools to individual and team software development
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain)
7. Use practical software development tools, including version control systems, automated build tools, and testing tools

C S 372. Data Structures and Algorithms**4 Credits (3+2P)**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. Taught with C S 469. May be repeated up to 4 credits.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Analyze the growth of functions via asymptotic notation
2. Evaluate the asymptotic running time of a given algorithm
3. Solve recurrence relations of the kinds encountered in algorithm analysis
4. Design algorithms using the divide-and-conquer technique
5. Design algorithms using the greedy technique
6. Design algorithms using the dynamic-programming technique
7. Use and analyze data structures based on trees
8. Analyze the design, correctness, and time complexity of basic graph algorithms

C S 380. Introduction to Cryptography**3 Credits (3)**

The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Consent of Instructor required. Taught with: C S 525.

Prerequisite: C S 278 (or equivalent) with a C or better.

Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of cryptographic primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions;
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

C S 381. Principles of Virtual Reality**3 Credits (3)**

This course is an introduction to building systems and doing research in / on virtual reality. We cover system design, development, and evaluation, with an emphasis on recent research in the space. We cover a range of methods, qualitative and quantitative, in order to develop insights into effective VR designs. Students in this class will develop a foundation in VR development; learn about current topics in VR; and design, develop, evaluate, and report on a VR system. Consent of Instructor required.

Prerequisite: C S 485.

Learning Outcomes

1. Design and develop systems in virtual reality.
2. Understand the variety of development techniques in VR.
3. Understand the state-of-the-art in VR systems.
4. Communicate understanding of people, designs, and evaluations through presentations, demos, and/or reports.

C S 382. Modern Web Technologies**3 Credits (3)**

In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and responsive web design. Finally, we cover advanced topics including the design and implementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Consent of Instructor required. Taught with: C S 532.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

C S 383. Introduction to Deep Learning**3 Credits (3)**

The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught together with C S 533. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

C S 384. Graph Data Mining**3 Credits (3)**

The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining
2. Graph representation and graph querying using graph manipulating toolbox/library
3. Use random and scale-free graph models to generate graphs and visualize complex network properties
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization
5. Implement graph representation learning algorithms and graph neural networks
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

C S 409. Independent Study**1-6 Credits (1-6)**

Faculty supervised investigation, to culminate in a written report. May be repeated up to 6 credits.

Prerequisite(s): Written agreement with faculty supervisor.

C S 419. Computing Ethics and Social Implications of Computing**1 Credit (1)**

An overview of ethics for computing majors includes: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems.

Prerequisite: At least a C- in C S 371.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

C S 448. Senior Project**4 Credits (4)**

Capstone course in which C S majors work in teams and apply computer science skills to complete a large project. Restricted to: C S majors.

Prerequisite: At least a C- in C S 370 and C S 371.

Learning Outcomes

1. Apply design and development principles in the construction of software systems of varying complexity
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. Use current techniques, skills, and tools necessary for computing practice
5. Analyze a problem, and identify and define the computing requirements appropriate to its solution
6. Function effectively as teams to accomplish a common goal
7. Communicate effectively with a range of audiences

C S 449. Senior Thesis**4 Credits (4)**

Capstone course in which C S majors apply computer science skills to complete a research project, culminating in a written thesis report. Restricted to: C S majors.

Prerequisite: At least a C- in C S 370 and C S 371.

Learning Outcomes

1. Apply design and development principles in the construction of software systems of varying complexity
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. Use current techniques, skills, and tools necessary for computing practice
5. Analyze a problem, identify, and define the computing requirements appropriate to its solution
6. Communicate effectively with a range of audiences via presentations and technical reports

C S 451. C++ Programming**3 Credits (3)**

Programming in the C++ language. Taught with C S 151. More advanced than C S 151. Recommended for nonmajors only. Not for CS undergraduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Use various data types and the corresponding operations.
2. Write C++ programs that contain expressions, program control, functions, arrays, and input/output.
3. Explain basic object-oriented programming concepts.
4. Demonstrate proficiency in using classes, inheritance, pointers, streams, and recursion.

C S 452. Java Programming**3 Credits (2+2P)**

Programming in the Java language. More advanced than C S 152. Recommended for nonmajors only. Not for CS undergraduate standing. May be repeated up to 3 credits.

C S 453. Python Programming I**3 Credits (3)**

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. Taught with C S 153. More advanced than C S 153.

Learning Outcomes

1. Develop an algorithm to solve a problem
2. Demonstrate the ability to use Python data types: int, float, strings, and lists; and the built-in functions associated with those data types
3. Edit and debug programs using the Spyder IDE for Python
4. Implement algorithms using the Python features of assignment, input, output, branches, loops, and functions
5. Explain the fundamental concepts of object-oriented programming with Python
6. Design and implement Python classes based on given attributes and behaviors
7. Work with existing Python modules such as math, random, and os
8. Write Python programs that input data from files and store results in files

C S 454. Python Programming II**3 Credits (3)**

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas. For graduate students only. Has more advanced work than C S 154, and does not count towards CS major requirements. Not for CS undergraduate students. May be repeated up to 3 credits. Restricted to: exclude C S majors.

Prerequisite(s): C S 153 or C S 453.

C S 458. R Programming I**3 Credits (3)**

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used. For graduate students only. Has more advanced work than C S 158. Does not count towards CS major requirements. May be repeated up to 3 credits.

Prerequisite(s): Good understanding of college algebra or higher.

C S 460. Computer Science I Transition**3 Credits (3)**

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For C S graduate students only; cannot be used to meet a C S student's program of study. Taught with C S 172.

Learning Outcomes

1. Develop algorithms to solve problems
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion
3. Apply an understanding of primitive and object data types
4. Design and implement classes based on given attributes and behaviors
5. Explain the fundamental concepts of object-oriented programming

C S 462. Object Oriented Programming Transition**3 Credits (3)**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 271.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Develop an algorithm to solve a problem.
2. Implement algorithms using the C and C++ languages including imperative and object-oriented language features.
3. Demonstrate a noticeable increase in understanding of problem analysis and program design beyond what was learned in C S 172, E E 112, or E E 161
4. Demonstrate proficiency in using control structures including if statements (single selection), switch (multiple selection), and loops (repetition).
5. Demonstrate proficiency in using arrays and functions.
6. Create UML class and relationship diagrams.
7. Design a class to model a real-world person, place, thing, or event.
8. Use editing and debugging software to create, debug, and test C and C++ programs.
9. Understand the basic terminology used in object-oriented programming. 1
10. Create a make file to build an executable from a set of C or C++ source files.

C S 463. Introduction to Data Structures Transition**3 Credits (3)**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 272.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Be able to implement and use lists
2. Be able to implement and use stacks
3. Be able to implement and use queues
4. Be able to implement and use trees
5. Be able to perform the run time analysis of basic algorithms using Big O notation
6. Be able to implement, use, and analyze searching algorithms
7. Be able to solve a problem recursively
8. Take a problem statement from a user and convert it into a Java program that fulfills the user's needs
9. Create object oriented Java classes that effectively separate and hide implementation details from client applications

C S 464. Machine Programming and Organization Transition**3 Credits (3)**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 273.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Describe the architecture of a microcontroller, the interconnections between the components, and the basic units inside the CPU
2. Use signed and unsigned numbers, the associated branching instructions, and the corresponding flags in the status register
3. Explain immediate, direct, indirect addressing modes, their opcode and operands, and their utilities
4. Map high-level programming language features to assembly instructions, including loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion
5. Interface with I/O devices including LED and sensors via digital input and output, and analog-to-digital conversion
6. Program timers/counters and interrupts to control real-time applications
7. Design an assembly program

C S 465. Discrete Math for Computer Science Transition**3 Credits (3)**

Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. For C S graduate students only. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 278.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction
3. Use summations, formulas for the sum of arithmetic and geometric sequences
4. Explain and apply the concepts of sets and functions
5. Apply counting principles to determine the number of various combinatorial configurations

C S 466. Compilers and Automata Transition**3 Credits (3)**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For C S graduate students only; cannot be used in a students program of study. Taught with C S 370.

Prerequisite: At least a C in (C S 271 or C S 462), in (C S 272 or C S 463), in (C S 273 or C S 464), or consent of instructor.

Learning Outcomes

1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA
3. Apply recursive descent parsing in programming a parser of a small grammar
4. Understand the ideas in LL and LR parsing of context-free language classes
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence

C S 468. Software Development Transition**3 Credits (3)**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. For C S graduate students only. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 371.

Prerequisite: At least a C- in C S 271 or C S 462, in C S 272 or C S 463, or consent of instructor.

Learning Outcomes

1. Understand and explain the activities and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system
3. Apply high and low level design ideas to create an object-oriented design of a software system
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages
5. Apply white and black box testing techniques and tools to individual and team software development
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain)
7. Use practical software development tools, including version control systems, automated build tools, and testing tools

C S 469. Data Structure and Algorithms Transition**3 Credits (3)**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. For CS graduate students only. Taught with CS 372. May be repeated up to 24 credits.

Prerequisite: At least a C- in (C S 272 or C S 463) and a C- in (C S 278 or C S 465), or consent of instructor.

Learning Outcomes

1. Analyze the growth of functions via asymptotic notation
2. Evaluate the asymptotic running time of a given algorithm
3. Solve recurrence relations of the kinds encountered in algorithm analysis
4. Design algorithms using the divide-and-conquer technique
5. Design algorithms using the greedy technique
6. Design algorithms using the dynamic-programming technique
7. Use and analyze data structures based on trees
8. Analyze the design, correctness, and time complexity of basic graph algorithms

C S 471. Programming Language Structure I**3 Credits (3)**

Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for C S graduate students.

Prerequisite: At least a C- in C S 370 and C S 371.

Learning Outcomes

1. Improve the background for choosing appropriate programming languages for certain classes of programming problems
2. Increase the ability to learn new programming languages
3. Critically evaluate what paradigm and language are best suited for a new problem
4. Demonstrate the use of the primary segments for a running program
5. Apply the principles of functional programming
6. Apply the principles of logic programming
7. Program a simple parallel program with threads
8. Program in at least five different programming languages
9. Program in C to demonstrate architecture details

C S 473. Architectural Concepts I**3 Credits (3)**

Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for C S graduate students.

Prerequisite: At least a C- in C S 273 and C S 370.

Learning Outcomes

1. Explain the concepts in instruction set architecture
2. Analyze the behavior of pipelined CPU data path and control
3. Analyze behavior and performance of memory hierarchies with different cache designs
4. Describe the implementation of binary integer and floating point representation and arithmetic
5. Identify and analyze performance of instruction level parallelism and multi-core parallelism
6. Describe virtual memory and architectural support for operating systems
7. Understand the organization of various kinds of secondary storage devices, and their performance and tradeoffs
8. Create software that demonstrates performance of architectural features and evaluate the effects of software change

C S 474. Operating Systems I**3 Credits (3)**

Operating system principles and structures, and interactions with architectures. Not for C S graduate students.

Prerequisite: At least a C- in C S 273, C S 371, and C S 372.

Learning Outcomes

1. Explain OS control and management of hardware resources
2. Explain OS management and execution of processes
3. Explain OS control and management of real and virtual memory
4. Explain classical concurrency issues and their solutions
5. Analyze and implement threads
6. Analyze OS interaction with networks and architecture

C S 475. Artificial Intelligence I**3 Credits (3)**

Fundamental principles and techniques in artificial intelligence systems. Intelligent Agents; solving problems by searching; local search techniques; game-playing agents; constraint satisfaction problems; knowledge representation and reasoning. Further selected topics may also be covered. Not for C S graduate students. Taught with C S 505.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Use various search algorithms commonly used in problem-solving
2. Use methods for solving constraint satisfaction problems
3. Use propositional and first-order logic to represent knowledge
4. Use logical inference methods to derive conclusions from a knowledge base
5. Use adversarial search for game-playing agents
6. Analyze the different search strategies
7. Design and Implement heuristic search for problem-solving

C S 476. Computer Graphics I**3 Credits (3)**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for C S graduate students. Taught with C S 506.

Prerequisite: At least C- in C S 370 or C S 371.

Learning Outcomes

1. Techniques used in three-dimensional graphics
2. Computer Graphics lightning and shading
3. Client-server graphics using WebGL
4. Geometric and Solid modeling
5. Computer Graphics implementation algorithms

C S 477. Digital Game Design**3 Credits (3)**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Not for C S graduate students. Taught with C S 517.

Prerequisite/Corequisite: C S 371.

Learning Outcomes

1. Describe, analyze, and/or critique games with a consistent vocabulary
2. Design, develop, and playtest games
3. Understand the formal systems of games
4. Communicate game designs through demonstrations and presentations

C S 478. Computer Security**3 Credits (3)**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Not for C S graduate students. Taught with C S 513.

Prerequisite: At least a C- in C S 272, C S 273 or consent of instructor.

Learning Outcomes

1. Describe fundamental concepts in security and privacy
2. Understand requirements of security in different contexts
3. Describe practical implementation challenges in security/privacy system design
4. Explain at a high-level symmetric and public key cryptography
5. Explain various access control mechanisms such as authentication, authorization
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for

C S 479. Special Topics**1-12 Credits**

Topics announced in the Schedule of Classes. May be repeated under different subtitles. Not for C S graduate students. May be repeated up to 12 credits.

C S 480. Linux System Administration**3 Credits (3)**

Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.

Learning Outcomes

1. Be able to properly set up, configure, and maintain a Linux-based set of networked computers with shared resources
2. Understand the significance of proper administration of systems and its impact on users, their data and computational resources, and the security of the overall installation

C S 481. Visual Programming**3 Credits (3)**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Not for C S graduate students. Taught with C S 518.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Develop software in graph-based visual environments
2. Understand flows of control in visual programming environments
3. Use signals, digital and analog, to drive software
4. Communicate software design and evaluation with presentations, demos, and reports

C S 482. Database Management Systems I**3 Credits (3)**

Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for C S graduate students. Taught with C S 502.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Utilize the basic concepts of relational database model
2. Utilize database query languages (e.g. SQL)
3. Identify data integrity and security requirements
4. Analyze, capture, and model user requirements for building database systems using conceptual models
5. Design and normalize relational schemas
6. Apply application development methods to implement a database system

C S 484. Computer Networks I**3 Credits (3)**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for C S graduate students. Taught with C S 504.

Prerequisite: At least a C- in C S 272 and CS 273.

Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models
2. Describe the purpose and concepts of each layer in the OSI and TCP/IP models
3. Describe IP as a particular network layer protocol
4. Describe TCP and UDP as particular transport layer protocols
5. Describe Ethernet (11) and WiFi (15) as particular data link layer protocols
6. Describe and analyze routing and routing issues
7. Describe and analyze data link layer switching
8. Describe the need for application protocols such as HTTP
9. Explain other network issues such as multicasting and audio/video data streaming 1
10. Implement socket-based network programs

C S 485. Human-Centered Computing**3 Credits (3)**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Not for C S graduate students. Taught with C S 515.

Prerequisite: At least C- in C S 371.

Learning Outcomes

1. Describe, analyze, and/or critique a device interface using a design vocabulary
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results
4. Communicate design and evaluation with presentations, demos, and reports
5. Implement a variety of interaction techniques

C S 486. Bioinformatics**3 Credits (3)**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics. Not for C S graduate students. Taught with C S 516.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Explain the biology motivation of a bioinformatics question
2. Formulate a computational problem and its solution to address a molecular biology question
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly
4. Evaluate the performance of a bioinformatics algorithm on real data sets
5. Argue the correctness of a bioinformatics algorithm
6. Analyze the complexity of a bioinformatics algorithm

C S 487. Applied Machine Learning I**3 Credits (3)**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Not for Graduate Majors. Taught with: C S 519.

Prerequisite: At least a C- in C S 272, MATH 1511G; or consent of instructor.

Learning Outcomes

1. Implement and utilize different data processing techniques
2. Differentiate and assess several dimension reduction techniques
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages
4. Explain and demonstrate regression analysis
5. Describe and illustrate clustering approaches
6. Apply ensemble learning approaches
7. Implement several neural network classifiers, including deep learning models

C S 488. Introduction to Data Mining**3 Credits (3)**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Taught with C S 508.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection
3. Evaluate and compare the performance of different data mining / machine learning algorithms
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool

C S 489. Bioinformatics Programming**3 Credits (3)**

Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with C S 509. May be repeated up to 3 credits.

Learning Outcomes

1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data
2. Perform high-throughput data analysis with established R packages
3. Detect differential gene expression on RNA sequencing data
4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling)
5. Assess statistical significance of analytical results
6. Create automatic data analysis pipeline to link multiple software packages

C S 491. Parallel Programming**3 Credits (3)**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for C S graduate students. Taught with C S 521.

Prerequisite: At least a C- in C S 370 or consent of instructor.

Learning Outcomes

1. Describe existing parallel architectures including shared memory versus distributed memory platforms
2. Apply basic techniques for organizing parallel computations
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism
4. Explain alternative parallel techniques and hardware
5. Perform performance Analysis of different parallel programming techniques
6. Program shared memory machines using threads, processes, and the OpenMP library
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI)

C S 493. Algorithm Design and Implementation**3 Credits (3)**

This course introduces the basic knowledge of designing classical algorithms and implementing these algorithms using a programming language. In particular, the course teaches various data structures, including graphs and balanced binary search trees, and efficient schemes to implement these data structures. This course also teaches basic algorithm design techniques including divide-and-conquer, greedy scheme, and dynamic programming. This course covers graph algorithms, including graph traversals (depth-first search and breadth-first search), connectivity, shortest paths, and minimum spanning trees. Graduate standing. Not for CS students. Taught with C S 343.

Prerequisite: At least a C- in C S 272, or Consent of Instructor.

Learning Outcomes

1. Be able to use and implement sorting algorithms
2. Be able to design and implement graph algorithms
3. Be able to design and implement algorithms using the divide-and-conquer technique
4. Be able to design and implement algorithms using the greedy technique
5. Be able to design and implement algorithms using the dynamic programming technique
6. Be able to use and implement balanced search trees
7. Be able to use and implement hashing techniques
8. Be able to perform the run time analysis of basic algorithms using Big O notation

C S 494. Introduction to Smart Grids**3 Credits (3)**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with C S 514. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 and a C- in ENGR 230; or Consent of instructor.

Learning Outcomes

1. Get basic understanding of how conventional power system is operated and protected
2. Understand and use basic knowledge of communication techniques in smart grids
3. Understand and use basic knowledge for the coordination of the different units in smart grids
4. Understand and apply data mining techniques for protecting smart grids

C S 496. Cloud and Edge Computing**3 Credits (3)**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Not for graduate CS majors. Taught with: C S 522.

Prerequisite: At least a C- in C S 372; background in C S 484/C S 504 is preferred or consent of instructor.

Learning Outcomes

1. The emphasis of the course will be on the understanding the concepts and the engineering trade-offs involved in the design of cloud computing systems
2. Cloud deployment models, cloud service models (software-as-a-service, infrastructure-as-a-service, protocol-as-a-service), cloud architecture, cloud-edge security, service level agreements, and load balancing in cloud and datacenters
3. Learn about cloud computing, especially what are their fundamental components, how these components interact, and how the technology is evolving for the future (edge computing, cloudlets, mobile edge computing, etc.).

C S 502. Database Management Systems I**3 Credits (3)**

Database design and implementation; models of database management systems; privacy, security, protection, recovery; taught with C S 482; requires more advanced graduate work than C S 482. Students are expected to have solid knowledge of data structures and discrete mathematics.

Learning Outcomes

1. Utilize the basic concepts of relational database model
2. Utilize database query languages (e.g. SQL)
3. Identify data integrity and security requirements
4. Analyze, capture, and model user requirements for building database systems using conceptual models
5. Design and normalize relational schemas
6. Apply application development methods to implement a database system

C S 504. Computer Networks I**3 Credits (3)**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; taught with C S 484; requires more advanced graduate work than C S 484. Students are expected to have solid knowledge of data structures, machine-level programming. Knowledge of statistics (at the level of MATH 371 or MATH 470) is recommended.

Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models
2. Describe the purpose and concepts of each layer in the OSI and TCP/IP models
3. Describe IP as a particular network layer protocol
4. Describe TCP and UDP as particular transport layer protocols
5. Describe Ethernet (802-11) and WiFi (802-15) as particular data link layer protocols
6. Describe and analyze routing and routing issues
7. Describe and analyze data link layer switching
8. Describe the need for application protocols such as HTTP
9. Explain other network issues such as multicasting and audio/video data streaming
10. Implement socket-based network programs

C S 505. Artificial Intelligence I**3 Credits (3)**

Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; taught with C S 475; requires more advanced graduate work than C S 475. Students are expected to have strong knowledge of algorithms and data structures (at the level of C S 372).

Learning Outcomes

1. Use various search algorithms commonly used in problem-solving
2. Use methods for solving constraint satisfaction problems
3. Use propositional and first-order logic to represent knowledge
4. Use logical inference methods to derive conclusions from a knowledge base
5. Use adversarial search for game-playing agents
6. Analyze the different search strategies
7. Design and Implement heuristic search for problem-solving

C S 506. Computer Graphics I**3 Credits (3)**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Taught with C S 476. Requires more advanced graduate work than C S 476. Students are expected to have knowledge of compilers design and software engineering equivalent to C S 370 and C S 371.

Learning Outcomes

1. Techniques used in three-dimensional graphics
2. Computer Graphics lightning and shading
3. Client-server graphics using WebGL
4. Geometric and Solid modeling
5. Computer Graphics implementation algorithms

C S 508. Introduction to Data Mining**3 Credits (3)**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Students are expected to have a preparation in Discrete Mathematics and Data Structures equivalent to C S 272 and C S 278. Requires more advanced graduate work than C S 488. Taught with: C S 488.

Learning Outcomes

1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection
3. Evaluate and compare the performance of different data mining / machine learning algorithms
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool

C S 509. Bioinformatics Programming**3 Credits (3)**

Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with C S 489. Requires more advanced graduate work than C S 489.

Learning Outcomes

1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data
2. Perform high-throughput data analysis with established R packages
3. Detect differential gene expression on RNA sequencing data
4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling)
5. Assess statistical significance of analytical results
6. Create automatic data analysis pipeline to link multiple software packages

C S 510. Automata, Languages, Computability**3 Credits (3)**

Regular and context-free languages, pushdown and finite-state automata, Turing machines, models of computation, halting problems. Students are expected to have knowledge of algorithms equivalent to C S 372. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the language accepted by an automaton or generated by a regular expression or a context-free grammar
2. Design automata, regular expressions and context-free grammars accepting or generating a certain language
3. Prove properties of languages, grammars, and automata with formal mathematical methods
4. Convert between equivalent deterministic and non-deterministic finite automata, and regular expressions
5. Convert between equivalent context-free grammars and pushdown automata
6. Define Turing machines performing simple tasks

C S 513. Computer Security**3 Credits (3)**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Taught with C S 478. Requires more advanced graduate work than C S 478. Recommended knowledge of materials in C S 272. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 273 or consent of instructor.

Learning Outcomes

1. Describe fundamental concepts in security and privacy
2. Understand requirements of security in different contexts
3. Describe practical implementation challenges in security/privacy system design
4. Explain at a high-level symmetric and public key cryptography
5. Explain various access control mechanisms such as authentication, authorization
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for

C S 514. Introduction to Smart Grids**3 Credits (3)**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with C S 494. Requires more advanced work than C S 494. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 and a C- in ENGR 230; or Consent of instructor.

Learning Outcomes

1. Get basic understanding of how conventional power system is operated and protected
2. Understand and use basic knowledge of communication techniques in smart grids
3. Understand and use basic knowledge for the coordination of the different units in smart grids
4. Understand and apply data mining techniques for protecting smart grids

C S 515. Human-Centered Computing**3 Credits (3)**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Taught with C S 485. Requires more advanced graduate work than C S 485 with an emphasis on studying recent research in human-computer interaction. Students are expected to have knowledge of software engineering equivalent to C S 371.

Learning Outcomes

1. Describe, analyze, and/or critique a device interface using a design vocabulary
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results
4. Communicate design and evaluation with presentations, demos, and reports
5. Implement a variety of interaction techniques

C S 516. Bioinformatics**3 Credits (3)**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; taught with C S 486; requires more advanced graduate work than C S 486. Students are expected to have a knowledge of algorithms and data structures equivalent to C S 372 or exposure to Biology (equivalent to BIOL 2310 or BIOL 311).

Learning Outcomes

1. Explain the biology motivation of a bioinformatics question
2. Formulate a computational problem and its solution to address a molecular biology question
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly
4. Evaluate the performance of a bioinformatics algorithm on real data sets
5. Argue the correctness of a bioinformatics algorithm
6. Analyze the complexity of a bioinformatics algorithm

C S 517. Digital Game Design**3 Credits (3)**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Taught with C S 477. Requires more advanced graduate work than C S 477 with deeper attention to a team game project.

Learning Outcomes

1. Describe, analyze, and/or critique games with a consistent vocabulary
2. Design, develop, and playtest games
3. Understand the formal systems of games
4. Communicate game designs through demonstrations and presentations

C S 518. Visual Programming**3 Credits (3)**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Students must be in graduate standing to enroll. Taught with C S 481. Requires more advanced graduate work than C S 481.

Learning Outcomes

1. Develop software in graph-based visual environments
2. Understand flows of control in visual programming environments
3. Use signals, digital and analog, to drive software
4. Communicate software design and evaluation with presentations, demos, and reports

C S 519. Applied Machine Learning I**3 Credits (3)**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Taught with: C S 487. Requires more advanced graduate work than C S 487.

Learning Outcomes

1. Implement and utilize different data processing techniques
2. Differentiate and assess several dimension reduction techniques
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages
4. Explain and demonstrate regression analysis
5. Describe and illustrate clustering approaches
6. Apply ensemble learning approaches
7. Implement several neural network classifiers, including deep learning models

C S 521. Parallel Programming**3 Credits (3)**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; taught with C S 491; requires more advanced graduate work than C S 491. Students are expected to have knowledge of programming and machine organization equivalent to C S 271 and C S 273.

Learning Outcomes

1. Describe existing parallel architectures including shared memory versus distributed memory platforms
2. Apply basic techniques for organizing parallel computations
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism
4. Explain alternative parallel techniques and hardware
5. Perform performance Analysis of different parallel programming techniques
6. Program shared memory machines using threads, processes, and the OpenMP library
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI)

C S 522. Cloud and Edge Computing**3 Credits (3)**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Might have additional requirements for graduate students. To enroll in this course a background in C S 484/C S 504 is preferred or have consent from the instructor. Taught with: C S 496. Requires more advanced graduate work than C S 496.

Learning Outcomes

1. The emphasis of the course will be on the understanding the concepts and the engineering trade-offs involved in the design of cloud computing systems
2. Cloud deployment models, cloud service models (software-as-a-service, infrastructure-as-a-service, protocol-as-a-service), cloud architecture, cloud-edge security, service level agreements, and load balancing in cloud and datacenters
3. Learn about cloud computing, especially what are their fundamental components, how these components interact, and how the technology is evolving for the future (edge computing, cloudlets, mobile edge computing, etc.).

C S 525. Introduction to Cryptography**3 Credits (3)**

The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Consent of Instructor required. Taught with: C S 380. Requires more advanced graduate work than C S 380.

Prerequisite: C S 278 (or equivalent) with a C or better.

Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of cryptographic primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions;
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

C S 531. Principles of Virtual Reality**3 Credits (3)**

This course is an introduction to building systems and doing research in / on virtual reality. We cover system design, development, and evaluation, with an emphasis on recent research in the space. We cover a range of methods, qualitative and quantitative, in order to develop insights into effective VR designs. Students in this class will develop a foundation in VR development; learn about current topics in VR; and design, develop, evaluate, and report on a VR system. Taught with C S 381. Requires more advanced graduate work than C S 381.

Prerequisite: C S 485 or Consent of Instructor.

Learning Outcomes

1. Design and develop systems in virtual reality.
2. Understand the variety of development techniques in VR.
3. Understand the state-of-the-art in VR systems.
4. Communicate understanding of people, designs, and evaluations through presentations, demos, and/or reports.

C S 532. Modern Web Technologies**3 Credits (3)**

In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and responsive web design. Finally, we cover advanced topics including the design and implementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Consent of Instructor required. Taught with: C S 382. Requires more advanced graduate work than C S 382.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

C S 533. Introduction to Deep Learning**3 Credits (3)**

The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught with C S 383. Requires more advanced graduate work than C S 383. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

C S 534. Graph Data Mining**3 Credits (3)**

The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining. Taught with C S 384. Requires more advanced graduate work than C S 384. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining.
2. Graph representation and graph querying using graph manipulating toolbox/library.
3. Use random and scale-free graph models to generate graphs and visualize complex network properties.
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization.
5. Implement graph representation learning algorithms and graph neural network.
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

C S 570. Analysis of Algorithms**3 Credits (3)**

Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

Learning Outcomes

1. Prove algorithm correctness by loop-invariant
2. Prove an algorithm to be incorrect by counterexamples
3. Develop efficient divide-and-conquer algorithms
4. Design and analyze binary search tree algorithms
5. Construct dynamic programming solutions
6. Prove the correctness of dynamic programming solutions by contraposition
7. Traverse graphs efficiently
8. Find paths in graphs efficiently
9. Determine if a problem is NP-Complete or NP-Hard 1
10. Basic concepts of quantum computing

C S 573. Architectural Concepts II**3 Credits (3)**

Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474. Crosslisted with: E E 564.

Learning Outcomes

1. Be able to explain the features in a modern multicore CPU architecture
2. Be able to utilize hardware counter features of a CPU in performance evaluation
3. Be able to explain the architecture of GPUs and their capabilities and drawbacks
4. Be able to evaluate novel cutting-edge architectural features and designs
5. Be able to present a research paper to an advanced audience

C S 574. Operating Systems II**3 Credits (3)**

Advanced topics related to operating system principles, guided by the current literature. Students are expected to have knowledge of computer architectures and operating systems equivalent to C S 473 and C S 474.

Learning Outcomes

1. Further an understanding of the principles of operating systems.
2. Develop insight into process management and scheduling issues.
3. Understand memory management operation.
4. Develop an understanding of file system implementation and of multiple levels of hardware support and management.
5. Develop a deep understanding of the concepts of cooperating processes, including communication, synchronization, and deadlock (detection and avoidance).
6. Be able to evaluate operating system features.
7. Develop an understanding of the distributed operating system environment.

C S 575. Artificial Intelligence II**3 Credits (3)**

Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Students are expected to have knowledge of artificial intelligence equivalent to C S 475.

Learning Outcomes

1. Apply selected planning algorithms in solving problems
2. Identify problems where knowledge representation and reasoning techniques are applicable
3. Be able to apply answer set programming in problem solving
4. Be aware of various advanced research topics in Artificial Intelligence

C S 579. Special Topics**1-6 Credits**

Topic announced in the Schedule of Classes.

C S 581. Advanced Software Engineering**3 Credits (3)**

Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures, templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Students are expected to have knowledge of software engineering equivalent to C S 371.

Learning Outcomes

1. Be able to explain modern software development process ideas
2. Be able to apply agile software development techniques in a project
3. Be able to specify, design, and develop a complex software system in a team
4. Be able to properly utilize both black box and white box testing techniques
5. Be able to explain how unsound and incomplete formal methods can aid in system verification and validation
6. Be able to utilize sound and complete formal methods to prove properties of a system

C S 582. Database Management Systems II**3 Credits (3)**

Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Students are expected to have knowledge of data base management systems equivalent to C S 482.

Learning Outcomes

1. Analyze storage and file structures of an RDBMS
2. Analyze and apply indexing techniques of an RDBMS
3. Analyze query evaluation approaches of an RDBMS
4. Analyze the mechanisms of transaction management in an RDBMS

C S 583. Advanced Cryptography**3 Credits (3)**

This is an advanced cryptography course, which will cover cryptographic protocols such as zero-knowledge proofs, secret sharing schemes, secure two-party/multi-party computation, and more. We will also briefly cover real-world applications of these protocols. Students will also be exposed to recent research topics in cryptography (exact topics might vary every offering).

Prerequisite: At least a C- in C S 465.

Learning Outcomes

1. Understand advanced crypto primitives such as zero-knowledge proofs, fair exchange, verifiable encryption, k-of-n secret sharing, etc., and their security properties
2. Understand the theoretical underpinnings of protocols such as attribute-based encryption/signatures, two-party/multi-party secure computation
3. Given a real-world situation, be able to think of what protocols are best applicable in the scenario, and be able to reason about their security

C S 584. Computer Networks II**3 Credits (3)**

Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Students are expected to have knowledge of computer networks equivalent to C S 484, and of statistics equivalent to MATH 371 or MATH 470.

Learning Outcomes

1. Understand design of link layer protocols.
2. Understand challenges and implementations for multimedia streaming.
3. Be able to use basic security constructs in the networking context.
4. Understand the concepts of edge and cloud computing
5. Understand the concepts and challenges of Internet of Things
6. Learn concepts of distributed networking
7. Learn and evaluate future internet architectures

C S 586. Algorithms in Systems Biology**3 Credits (3)**

The course will introduce important algorithms and computational models used in systems biology to study molecular mechanisms for cellular dynamics, processes, and systems. Cellular processes, such as metabolism and signal transduction, are studied as systems and networks quantitatively from high throughput molecular measurements. The topics include molecular biological systems, network alignment, model simulation, network inference, model optimization, and hybrid models. Students will be able to construct models and analyze their properties in the context of molecular biological systems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

Learning Outcomes

1. Create mathematical representation of biological systems
2. Infer biological network topology from observed omics data set
3. Simulate the behavior of a biological system using a mathematical model
4. Characterize behaviors of biological systems
5. Estimate parameters in a biological system model
6. Validate a model's statistical relevance given observed data

C S 589. Special Research Problems**1-6 Credits (1-6)**

Faculty-supervised investigation, to culminate in a written report. Maximally 6 credits can be applied to the student program of study. Written agreement with faculty supervisor is the required consent. May be repeated up to 18 credits.

Learning Outcomes

1. Research experience for graduate student.

C S 598. Master's Project**1-6 Credits**

Project-oriented capstone course to be completed by M.S. students under supervision of their advisor. Maximum of 6 credits may be applied toward M.S. degree. Restricted to C S majors.

Prerequisite: written agreement with instructor.

C S 599. Master's Thesis**1-6 Credits (1-6)**

Thesis to be developed by M.S. Students under supervision of their advisor. May be repeated for a maximum of 6 credits. Restricted to majors.

Prerequisite: consent of instructor.

C S 600. Pre-dissertation Research**1-15 Credits**

Pre-dissertation research.

C S 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

Office Location: Science Hall 123

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Postal Address

Department of Computer Science
New Mexico State University
P.O. Box 30001, MSC CS
Las Cruces, NM 88003

Shipping Address

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New Mexico State University
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Las Cruces, NM 88003

Website: <https://computerscience.nmsu.edu/>

Computer Science - Bachelor of Arts

The Bachelor of Arts in Computer Science is an open, flexible degree plan that offers the student both a rigorous undergraduate degree program in Computer Science and an extensive open credit hour allotment to pursue knowledge in other domains. It is an excellent choice to combine into a double major program, and is an option for the student who has an interest in learning both domain knowledge in some areas outside of Computer Science, and in acquiring a Computer Science background sufficient to pursue a strong technology career.

Students planning to undertake graduate work in Computer Science are encouraged to pursue the Bachelor of Science degree rather than the Bachelor of Arts degree.

General Requirements Exception

A grade of a least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i> ¹		
	<i>English Composition - Level 1</i> ²	4
	<i>English Composition - Level 2</i> ²	
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i> ³		
Choose one from the following:		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
<i>Area III: Laboratory Sciences Course (4 credits)</i> ²		
<i>Area IV: Social & Behavioral Sciences (3 credits)</i> ²		
Either an <i>Area III/IV: Laboratory Sciences Course</i> or <i>Social/Behavioral Sciences Course (4 or 3 credits)</i> ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i> ²		3-4
Three of the six Statistics/Applied Statistics course can potentially fulfill this requirement (See below)		
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448	Senior Project	4
or C S 449	Senior Thesis	
C S 482	Database Management Systems I	3
<i>Computer Science Electives</i>		
List 1:		

Select 6-7 credits from the following:⁵

6-7

C S 343	Algorithm Design & Implementation
or C S 372	Data Structures and Algorithms
C S 380	Introduction to Cryptography
C S 381	Principles of Virtual Reality
C S 382	Modern Web Technologies
C S 383	Introduction to Deep Learning
C S 384	Graph Data Mining
C S 471	Programming Language Structure I
C S 473	Architectural Concepts I
C S 474	Operating Systems I
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 477	Digital Game Design
C S 478	Computer Security
C S 479	Special Topics ⁶
C S 480	Linux System Administration
C S 481	Visual Programming
C S 484	Computer Networks I
C S 485	Human-Centered Computing
C S 486	Bioinformatics
C S 487	Applied Machine Learning I
C S 488	Introduction to Data Mining
C S 489	Bioinformatics Programming
C S 491	Parallel Programming
C S 496	Cloud and Edge Computing

List 2:

Select 6 credits from the following:⁵

6

C S 380	Introduction to Cryptography
C S 381	Principles of Virtual Reality
C S 382	Modern Web Technologies
C S 383	Introduction to Deep Learning
C S 384	Graph Data Mining
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 477	Digital Game Design
C S 478	Computer Security
C S 479	Special Topics ⁶
C S 480	Linux System Administration
C S 481	Visual Programming
C S 484	Computer Networks I
C S 485	Human-Centered Computing
C S 486	Bioinformatics
C S 487	Applied Machine Learning I
C S 488	Introduction to Data Mining
C S 489	Bioinformatics Programming
C S 491	Parallel Programming
C S 496	Cloud and Edge Computing

Non-departmental Requirements (in addition to Gen.Ed/VWW)

Select two upper-division courses in any one department except Computer Science

6-8

Choose one from the following:

3

MATH 1350G	Introduction to Statistics (can count towards General Education Elective requirement)
MATH 2350G	Statistical Methods (can count towards General Education Elective requirement)
STAT 371	Statistics for Engineers and Scientists I

STAT 470	Probability: Theory and Applications
A ST 311	Statistical Applications
Second Language Requirement: (not required)	
Electives, to bring the total credits to 120⁷	
Select upper division electives to bring total upper division to 48	
Total Credits	120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits² See the General Education (p. 220) section of the catalog for a full list of courses.³ Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter either first.⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.⁵ A course can satisfy only one requirement.⁶ Must be taken for 3 credits to count as one course.⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.**Second Language Requirement**

For the Bachelor of Arts with a major in Computer Science, there is no second language requirement for the degree.

A Suggested Plan of Study For Students

This roadmap assumes student placement in MATH 1220G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

This roadmap adds the MATH 1511G prerequisites into the plan, MATH 1220G and MATH 1250G will not appear on the requirements tab. Any students who test into MATH 1511G can supplement MATH 1220G and MATH 1250G with elective credits.

Freshman		Credits
C S 111	Computer Science Principles ¹	4
ENGL 1110G	Composition I	4
MATH 1220G	College Algebra ²	3
COMM 1115G	Introduction to Communication	3
C S 172	Computer Science I	4
MATH 1511G or MATH 1430G	Calculus and Analytic Geometry I or Applications of Calculus I	4
Area III: Laboratory Science Course ³		4
Area IV: Social/ Behavioral Sciences Course ³		3
Electives as needed to meet the minimum credit requirement for financial aid ⁴		1-3
Credits		30-32
Sophomore		
C S 271	Object Oriented Programming	4

C S 273	Machine Programming and Organization	4
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
Area V: Humanities Course ³		3
Electives Courses as needed to meet minimum credit requirements ⁴		5-6
ENGL 2210G	Professional & Technical Communication	3
Electives as needed to meet the minimum credit requirement for financial aid ⁴		3
Credits		30-31

Junior

C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course ³		3-4
C S elective, List 1 ⁵		3
C S elective, List 1 ⁵		3
Upper division Course from another department		3-4
Viewing a Wider World Course ⁶		3
General Education Elective Course ³		3-4
Select one from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
A ST 311	Statistical Applications	
Electives as needed to meet the minimum credit requirement for financial aid ⁴		1
Credits		30-33

Senior

C S 482	Database Management Systems I	3
C S elective, List 1 ⁵		3
C S elective, List 1 ⁵		3
Upper division course from another department		3-4
Viewing a Wider World Course ⁶		3
Area VI: Creative and Fine Arts ³		3
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
Upper division electives to bring total upper division to 48 ⁴		3-7
Electives as needed to meet the minimum credit requirement for financial aid ⁴		4-7
Credits		30-38
Total Credits		120-134

¹ Required for students who do not pass MATH 1215 Intermediate Algebra or do not pass the CS placement exam and is not counted towards graduation

² MATH 1511G Calculus and Analytic Geometry I is the starting requirement for this degree but students may need to take MATH 1220G College Algebra and MATH 1511G Calculus and Analytic Geometry I before enrolling in it. If a student tests into MATH 1511G Calculus and Analytic Geometry I then elective credits can replace MATH 1220G College Algebra/MATH 1250G Trigonometry & Pre-Calculus in the roadmap.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ Any course offered by the university. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor

coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ For electives see List 1 or List 2 of Computer Science electives (p. 561) in Degree Requirement Section.

⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Computer Science - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment immediately after the bachelor level should strongly consider taking one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two concentrations. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications¹</i>		
<i>English Composition - Level 1²</i>		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		

MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II ³	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448	Senior Project	4
or C S 449	Senior Thesis	
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	

C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics ⁶	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 480	Applied Linear Algebra	
Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
<i>Lab Science Courses</i>		
Select one from the following: ⁵		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 ⁷		14

Students who plan to seek employment immediately after the bachelor level should strongly consider taking one of the concentration area curricula in addition to the general and departmental requirements.⁸

Total Credits 120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits

² See the General Education (p. 220) section of the catalog for a full list of courses

³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ A course can satisfy only one requirement.

⁶ Must be taken for 3 credits to count as a course.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁸ For concentration coursework see,

- Algorithm Theory (p. 566)
- Artificial Intelligence (p. 568)
- Big Data and Data Science (p. 571)
- Cybersecurity (p. 576)
- Computer Networking (p. 573)
- Human Computer Interaction (p. 578)
- Software Development (p. 581)

Second Language Requirement

For the Bachelor of Science with a major in Computer Science (including all Concentration Areas), there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course ²		3

Area V: Humanities Course ²		3
Credits		30
Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³		3+
Credits		31-34
Junior		
C S 372	Data Structures and Algorithms	0-4
C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective ⁴		3
MATH elective (upper division) ⁵		3
Lab Science Elective ⁶		4
Lab Science Elective ⁶		4
Viewing a Wider World ⁷		3
Viewing a Wider World ⁷		3
Elective credits if needed for financial aid requirements ³		3
Credits		29-33
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective ⁶		4
Computer Science 400-level Elective ⁴		3
Upper division electives to bring total upper division to 48 ³		4
Electives as needed to meet minimum credit requirements ³		7
Credits		26
Total Credits		116-123

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration. *Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

⁴ See list of Computer Science electives (p. 563) in Degree Requirement Section.

⁵ **Math Electives:**

- MATH 331 Introduction to Modern Algebra
- MATH 332 Introduction to Analysis
- MATH 377 Introduction to Numerical Methods
- MATH 392 Introduction to Ordinary Differential Equations
- MATH 454 Logic and Set Theory
- MATH 455 Elementary Number Theory

⁶ See list of Lab Science (p. 563) courses in the Degree Requirement Section.

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements or to consider the combined BS+MS accelerated program (MAP).

Computer Science (Algorithm Theory) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications</i> ¹		
<i>English Composition - Level 1</i> ²		4

<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences</i>		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits)</i> ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ³ or Calculus and Analytic Geometry II Honors	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3

C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics ⁶	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

MATH 2415	Introduction to Linear Algebra	3
or MATH 480	Applied Linear Algebra	

Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	

Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

Lab Science Courses

Select one from the following: ⁵		4
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	

PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120⁷		14
<i>The specific requirements for the concentration in Algorithm Theory are as follows:</i>		
Select 3-4 credits from the following:		
C S 372	Data Structures and Algorithms	
C S 343	Algorithm Design & Implementation	
Select 9 credits from the following:		
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
Total Credits		120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits

² See the General Education (p. 220) section of the catalog for a full list of courses

³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ A course can satisfy only one requirement.

⁶ Must be taken for 3 credits to count as a course.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course ²		3

Area V: Humanities Course ²		3
Credits		30
Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³		3+
Credits		31-34
Junior		
C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective ⁴		3
MATH elective (upper division) ⁵		3
Lab Science Elective ⁶		4
Lab Science Elective ⁶		4
Viewing a Wider World ⁷		3
Viewing a Wider World ⁷		3
Elective credits if needed for financial aid requirements ³		3
Credits		33
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective ⁶		4
Computer Science 400-level Elective ⁴		3
Upper division electives to bring total upper division to 48 ³		4
Electives as needed to meet minimum credit requirements ³		7
Credits		26
Total Credits		120-123

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 224) section of the catalog for a full list of courses

³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration. *Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

⁴ See list of Computer Science electives (p. 566) in Degree Requirement Section.

⁵ Math Electives:

- MATH 331 Introduction to Modern Algebra
- MATH 332 Introduction to Analysis
- MATH 377 Introduction to Numerical Methods
- MATH 392 Introduction to Ordinary Differential Equations
- MATH 454 Logic and Set Theory
- MATH 455 Elementary Number Theory

⁶ See list of Lab Science (p. 566) courses in the Degree Requirement Section.

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Artificial Intelligence) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications ¹		
	English Composition - Level 1 ²	4
	English Composition - Level 2	

ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ³ Calculus and Analytic Geometry II Honors	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3

Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics ⁶	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415 or MATH 480	Introduction to Linear Algebra Applied Linear Algebra	3
Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
<i>Lab Science Courses</i>		
Select one from the following: ⁵		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	

PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120⁷		14
<i>The specific requirements for the concentration in Artificial Intelligence are as follows:</i>		
Select 3-4 credits from the following:		
C S 343	Algorithm Design & Implementation	
C S 372	Data Structures and Algorithms	
Select 9 credits from the following:		
C S 475	Artificial Intelligence I	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
Total Credits		120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits

² See the General Education (p. 220) section of the catalog for a full list of courses

³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ A course can satisfy only one requirement.

⁶ Must be taken for 3 credits to count as a course.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3
Credits		30
Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4

C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³		3+
Credits		31-34

Junior		
C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective ⁴		3
MATH elective (upper division) ⁵		3
Lab Science Elective ⁶		4
Lab Science Elective ⁶		4
Viewing a Wider World ⁷		3
Viewing a Wider World ⁷		3
Elective credits if needed for financial aid requirements ³		3
Credits		33
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective ⁶		4
Computer Science 400-level Elective ⁴		3
Upper division electives to bring total upper division to 48 ³		4
Electives as needed to meet minimum credit requirements ³		7
Credits		26
Total Credits		120-123

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.

Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See list of Computer Science electives (p. 568) in Degree Requirement Section.

⁵ **Math Electives:**

- MATH 331 Introduction to Modern Algebra
- MATH 332 Introduction to Analysis
- MATH 377 Introduction to Numerical Methods
- MATH 392 Introduction to Ordinary Differential Equations

- MATH 454 Logic and Set Theory
- MATH 455 Elementary Number Theory

⁶ See list of Lab Science (p. 568) courses in the Degree Requirement Section.

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Big Data and Data Science) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications</i> ¹		
<i>English Composition - Level 1</i> ²		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	

HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II ³	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	

C S 473	Architectural Concepts I
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 477	Digital Game Design
C S 478	Computer Security
C S 479	Special Topics ⁶
C S 480	Linux System Administration
C S 481	Visual Programming
C S 484	Computer Networks I
C S 485	Human-Centered Computing
C S 486	Bioinformatics
C S 487	Applied Machine Learning I
C S 488	Introduction to Data Mining
C S 489	Bioinformatics Programming
C S 491	Parallel Programming
C S 496	Cloud and Edge Computing

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

MATH 2415	Introduction to Linear Algebra	3
or MATH 480	Applied Linear Algebra	

Select one from the following: 3

MATH 331	Introduction to Modern Algebra
MATH 332	Introduction to Analysis
MATH 377	Introduction to Numerical Methods
MATH 392	Introduction to Ordinary Differential Equations
MATH 454	Logic and Set Theory
MATH 455	Elementary Number Theory

Select one from the following: 3

A ST 311	Statistical Applications
STAT 371	Statistics for Engineers and Scientists I
STAT 470	Probability: Theory and Applications

Lab Science CoursesSelect one from the following: ⁵ 4

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab

Second Language Requirements: (not required)**Electives, to bring the total credits to 120 ⁷** 14

The specific requirements for the concentration in Big Data and Data Science are as follows:

C S 371	Software Development (required)
Select 9 credits from the following:	
C S 475	Artificial Intelligence I
C S 485	Human-Centered Computing
C S 487	Applied Machine Learning I
C S 488	Introduction to Data Mining
Total Credits	120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits

² See the General Education (p. 220) section of the catalog for a full list of courses

³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ A course can satisfy only one requirement.

⁶ Must be taken for 3 credits to count as a course.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3

Credits 30

Sophomore		Credits
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3

Area VI: Creative and Fine Arts ² 3

Select one from the following:	3
A ST 311 Statistical Applications	
STAT 371 Statistics for Engineers and Scientists I	
STAT 470 Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³	3+

Credits 31-34

Junior

C S 371 Software Development	4
C S 471 Programming Language Structure I	3
C S 482 Database Management Systems I	3
Computer Science 400-level Elective ⁴	3
MATH elective (upper division) ⁵	3
Lab Science Elective ⁶	4
Lab Science Elective ⁶	4
Viewing a Wider World ⁷	3
Viewing a Wider World ⁷	3
Elective credits if needed for financial aid requirements ³	3

Credits 33

Senior

C S 448 Senior Project	4
or C S 449 or Senior Thesis	
C S 419 Computing Ethics and Social Implications of Computing	1
C S 474 Operating Systems I	3
Lab Science Elective ⁶	4
Computer Science 400-level Elective ⁴	3
Upper division electives to bring total upper division to 48 ³	4
Electives as needed to meet minimum credit requirements ³	7

Credits 26

Total Credits 120-123

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1521G first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration. *Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

⁴ See list of Computer Science electives (p. 571) in Degree Requirement Section.

⁵ **Math Electives:**

- MATH 331 Introduction to Modern Algebra
- MATH 332 Introduction to Analysis
- MATH 377 Introduction to Numerical Methods
- MATH 392 Introduction to Ordinary Differential Equations
- MATH 454 Logic and Set Theory
- MATH 455 Elementary Number Theory

⁶ See list of Lab Science (p. 571) courses in the Degree Requirement Section.

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Computer Networking) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications ¹</i>		
<i>English Composition - Level 1 ²</i>		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
<i>Area III: Laboratory Sciences</i>		

Choose two different courses from the following:

ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) ²		
Area V: Humanities ²		3
Area VI: Creative and Fine Arts ²		3
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II ³	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	

C S 479 Special Topics ⁶

C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

MATH 2415	Introduction to Linear Algebra	3
or MATH 480	Applied Linear Algebra	
Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

Lab Science Courses

Select one from the following: ⁵		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	

Second Language Requirements: (not required)

Electives, to bring the total credits to 120 ⁷ **14**

The specific requirements for the concentration in Computer Networking are as follows:

C S 484	Computer Networks I (required)	
C S 496	Cloud and Edge Computing (required)	
Select 6 credits from the following:		
C S 382	Modern Web Technologies	

C S 473	Architectural Concepts I
C S 478	Computer Security
C S 480	Linux System Administration
C S 491	Parallel Programming
<hr/>	
Total Credits	120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits

² See the General Education (p. 220) section of the catalog for a full list of courses

³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ A course can satisfy only one requirement.

⁶ Must be taken for 3 credits to count as a course.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3
Credits		30

Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	

STAT 470	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³		3+
Credits		31-34
Junior		
C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective ⁴		3
MATH elective (upper division) ⁵		3
Lab Science Elective ⁶		4
Lab Science Elective ⁶		4
Viewing a Wider World ⁷		3
Viewing a Wider World ⁷		3
Elective credits if needed for financial aid requirements ³		3
Credits		33
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective ⁶		4
Computer Science 400-level Elective ⁴		3
Upper division electives to bring total upper division to 48 ³		4
Electives as needed to meet minimum credit requirements ³		7
Credits		26
Total Credits		120-123

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students who plan to graduate with a concentration needs to complete the specific requirements for the chosen concentration.

Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See list of Computer Science electives (p. 573) in Degree Requirement Section.

⁵ **Math Electives:**

- MATH 331 Introduction to Modern Algebra
- MATH 332 Introduction to Analysis
- MATH 377 Introduction to Numerical Methods
- MATH 392 Introduction to Ordinary Differential Equations
- MATH 454 Logic and Set Theory
- MATH 455 Elementary Number Theory

⁶ See list of Lab Science (p. 573) courses in the Degree Requirement Section.

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of

taking other computer science electives to satisfy their departmental requirements.

Computer Science (Cybersecurity) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications</i> ¹		
<i>English Composition - Level 1</i> ²		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences</i>		11
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ³ Calculus and Analytic Geometry II Honors	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics ⁶	
C S 480	Linux System Administration	

C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

MATH 2415	Introduction to Linear Algebra	3
or MATH 480	Applied Linear Algebra	

Select one from the following: 3

MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	

Select one from the following: 3

A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

Lab Science Courses

Select one from the following: 5 4

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	

Second Language Requirements: (not required)**Electives, to bring the total credits to 120⁷** 14The specific requirements for the concentration in Cybersecurity are as follows:⁸

C S 478	Computer Security (require)	
C S 484	Computer Networks I (require)	

Choose 6 credits from the following:

C S 380	Introduction to Cryptography	
C S 473	Architectural Concepts I	
C S 485	Human-Centered Computing	

C S 496	Cloud and Edge Computing	
Total Credits		120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits² See the General Education (p. 220) section of the catalog for a full list of courses³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.⁵ A course can satisfy only one requirement.⁶ Must be taken for 3 credits to count as a course.⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G	Calculus and Analytic Geometry II	4
Area IV: Social/ Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3
Credits		30

Sophomore		Credits
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³		3+

Credits 31-34

Junior		
C S 371	Software Development	4
C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective ⁴		3
MATH elective (upper division) ⁵		3
Lab Science Elective ⁶		4
Lab Science Elective ⁶		4
Viewing a Wider World ⁷		3
Viewing a Wider World ⁷		3
Elective credits if needed for financial aid requirements ³		3
Credits		33
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective ⁶		4
Computer Science 400-level Elective ⁴		3
Upper division electives to bring total upper division to 48 ³		4
Electives as needed to meet minimum credit requirements ³		7
Credits		26
Total Credits		120-123

- ¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ² See the General Education (p. 220) section of the catalog for a full list of courses
- ³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁴ See list of Computer Science electives (p. 576) in Degree Requirement Section.
- ⁵ **Math Electives:**
- MATH 331 Introduction to Modern Algebra
 - MATH 332 Introduction to Analysis
 - MATH 377 Introduction to Numerical Methods
 - MATH 392 Introduction to Ordinary Differential Equations
 - MATH 454 Logic and Set Theory
 - MATH 455 Elementary Number Theory
- ⁶ See list of Lab Science (p. 576) courses in the Degree Requirement Section.
- ⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Human Computer Interaction) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications</i> ¹		
<i>English Composition - Level 1</i> ²		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences</i>		
Choose two different courses from the following:		11
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) ²		
Area V: Humanities ²		3
Area VI: Creative and Fine Arts ²		3
General Education Elective		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ³ Calculus and Analytic Geometry II Honors	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics ⁶	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	

C S 486	Bioinformatics	
C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415 or MATH 480	Introduction to Linear Algebra Applied Linear Algebra	3
Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: ⁵		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 ⁷		14
<i>The specific requirements for the concentration in Human Computer Interaction are as follows:</i>		
C S 371	Software Development (required)	
C S 485	Human-Centered Computing (required)	
Select 6 credits from the following:		
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 481	Visual Programming	
Total Credits		120

- ¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits
- ² See the General Education (p. 220) section of the catalog for a full list of courses
- ³ MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁵ A course can satisfy only one requirement.
- ⁶ Must be taken for 3 credits to count as a course.
- ⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G	Calculus and Analytic Geometry II	4
Area IV: Social/ Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3
Credits		30
Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements ³		3+
Credits		31-34
Junior		
C S 371	Software Development	4

C S 471	Programming Language Structure I	3
C S 482	Database Management Systems I	3
Computer Science 400-level Elective ⁴		3
MATH elective (upper division) ⁵		3
Lab Science Elective ⁶		4
Lab Science Elective ⁶		4
Viewing a Wider World ⁷		3
Viewing a Wider World ⁷		3
Elective credits if needed for financial aid requirements ³		3
Credits		33
Senior		
C S 448 or C S 449	Senior Project or Senior Thesis	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 474	Operating Systems I	3
Lab Science Elective ⁶		4
Computer Science 400-level Elective ⁴		3
Upper division electives to bring total upper division to 48 ³		4
Electives as needed to meet minimum credit requirements ³		7
Credits		26
Total Credits		120-123

- ¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ² See the General Education (p. 220) section of the catalog for a full list of courses
- ³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁴ See list of Computer Science electives (p. 578) in Degree Requirement Section.
- ⁵ **Math Electives:**
- MATH 331 Introduction to Modern Algebra
 - MATH 332 Introduction to Analysis
 - MATH 377 Introduction to Numerical Methods
 - MATH 392 Introduction to Ordinary Differential Equations
 - MATH 454 Logic and Set Theory
 - MATH 455 Elementary Number Theory
- ⁶ See list of Lab Science (p. 578) courses in the Degree Requirement Section.
- ⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Software Development) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria (through 9/30/2022).

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
<i>Area I: Communications</i> ¹		
<i>English Composition - Level 1</i> ²		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ³	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
<i>Area III: Laboratory Sciences</i>		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II ³	4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 448 or C S 449	Senior Project Senior Thesis	4
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select 6 credits from the following: ⁵		6
C S 380	Introduction to Cryptography	
C S 381	Principles of Virtual Reality	
C S 382	Modern Web Technologies	
C S 383	Introduction to Deep Learning	
C S 384	Graph Data Mining	
C S 473	Architectural Concepts I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 477	Digital Game Design	
C S 478	Computer Security	
C S 479	Special Topics ⁶	
C S 480	Linux System Administration	
C S 481	Visual Programming	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 486	Bioinformatics	

C S 487	Applied Machine Learning I	
C S 488	Introduction to Data Mining	
C S 489	Bioinformatics Programming	
C S 491	Parallel Programming	
C S 496	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 480	Applied Linear Algebra	
Select one from the following:		3
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 377	Introduction to Numerical Methods	
MATH 392	Introduction to Ordinary Differential Equations	
MATH 454	Logic and Set Theory	
MATH 455	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
<i>Lab Science Courses</i>		
Select one from the following: ⁵		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 ⁷		14
The specific requirements for the concentration in Software Engineering are as follows:		
C S 371	Software Development (required)	
Select 9 credits from the following list:		
C S 382	Modern Web Technologies	
C S 476	Computer Graphics I	
C S 478	Computer Security	
C S 480	Linux System Administration	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	

C S 491	Parallel Programming	
Total Credits		120

- ¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits
- ² See the General Education (p. 220) section of the catalog for a full list of courses
- ³ MATH 1511G Calculus and Analytic Geometry I and MATH 1511G Calculus and Analytic Geometry I are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁵ A course can satisfy only one requirement.
- ⁶ Must be taken for 3 credits to count as a course.
- ⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 273	Machine Programming and Organization	4
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3
Credits		30
Sophomore		
C S 272	Introduction to Data Structures	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 372	Data Structures and Algorithms	4
COMM 1115G	Introduction to Communication	3
ENGL 2210G	Professional & Technical Communication	3
MATH 2415 or MATH 480	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts ²		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

Elective credits if needed for financial aid requirements ³	3+
Credits	31-34
Junior	
C S 371	Software Development 4
C S 471	Programming Language Structure I 3
C S 482	Database Management Systems I 3
Computer Science 400-level Elective ⁴	3
MATH elective (upper division) ⁵	3
Lab Science Elective ⁶	4
Lab Science Elective ⁶	4
Viewing a Wider World ⁷	3
Viewing a Wider World ⁷	3
Elective credits if needed for financial aid requirements ³	3
Credits	33
Senior	
C S 448	Senior Project 4
or C S 449	or Senior Thesis
C S 419	Computing Ethics and Social Implications of Computing 1
C S 474	Operating Systems I 3
Lab Science Elective ⁶	4
Computer Science 400-level Elective ⁴	3
Upper division electives to bring total upper division to 48 ³	4
Electives as needed to meet minimum credit requirements ³	7
Credits	26
Total Credits	120-123

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1521G first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration. *Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

⁴ See list of Computer Science electives (p. 581) in Degree Requirement Section.

⁵ **Math Electives:**

- MATH 331 Introduction to Modern Algebra
- MATH 332 Introduction to Analysis
- MATH 377 Introduction to Numerical Methods
- MATH 392 Introduction to Ordinary Differential Equations
- MATH 454 Logic and Set Theory
- MATH 455 Elementary Number Theory

⁶ See list of Lab Science (p. 581) courses in the Degree Requirement Section.

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of

taking other computer science electives to satisfy their departmental requirements.

Cybersecurity - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i> ¹		
	<i>English Composition - Level 1</i> ²	4
	<i>English Composition - Level 2</i> ²	3
	<i>Oral Communication</i>	3
<i>Area II: Mathematics</i> ³		
	Choose one from the following:	3-4
	MATH 1430G Applications of Calculus I	
	MATH 1511G Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
	C S 171G Modern Computing in Practice	
	<i>Area III: Laboratory Sciences Course (4 credits)</i> ²	
	<i>Area IV: Social & Behavioral Sciences (3 credits)</i> ²	
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
	MATH 1521G Calculus and Analytic Geometry II	4
	or MATH 1521H Calculus and Analytic Geometry II Honors	
Viewing a Wider World ⁴		6
Departmental/College Requirements		
BCIS 482	Management of Information Security	3
C S 111	Computer Science Principles	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
or E E 212	Introduction to Computer Organization	
C S 278	Discrete Mathematics for Computer Science	4
C S 371	Software Development	4
C S 380	Introduction to Cryptography	3
C S 448	Senior Project	4
C S 474	Operating Systems I	3
C S 478	Computer Security	3
C S 479	Special Topics (Mobile Computing and Wireless)	3
or E E 490	Selected Topics	
C S 479	Special Topics (Software Reverse Engineering)	3
C S 480	Linux System Administration	3
C S 482	Database Management Systems I	3
C S 484	Computer Networks I	3
CJUS 412	Introduction to Security Technology and Loss Prevention	3
E E 458	Hardware Security and Trust	3
E T 339	Introduction to Digital Forensics and Incident Response	3
Choose one sequence from the following:		6-8

C S 172 & C S 271	Computer Science I and Object Oriented Programming	
C S 152 & C S 271	Java Programming and Object Oriented Programming	
Choose one from the following:		3
E E 200	Linear Algebra, Probability and Statistics Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120⁵		8-11
Select upper division electives to bring total upper division to 48		
C S 496	Cloud and Edge Computing (Recommended)	
Total Credits		120

¹ Students with Area I transfer credits may sometimes complete this requirement with 9 credits

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Either MATH 1511G Calculus and Analytic Geometry I or MATH 1430G Applications of Calculus I are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study For Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I	4
Choose one from the following: ¹		3-4
MATH 1511G	Calculus and Analytic Geometry I	
MATH 1430G	Applications of Calculus I	
Area IV: Social/Behavioral Sciences Course ²		3
C S 171G	Modern Computing in Practice	4
Credits		14-15
Semester 2		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
C S 172	Computer Science I	4

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	

Area V: Humanities Course ²	3
Credits	17

Second Year

Semester 1

Area VI: Creative and Fine Arts Course ²		3
Area III: Laboratory Sciences Course ²		4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4

Credits	15
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Semester 2

VWW ^{3,5}		3
C S 273 or EE 212	Machine Programming and Organization or Introduction to Computer Organization	4
C S 278	Discrete Mathematics for Computer Science	4

Choose one from the following:		3
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E E 200	Linear Algebra, Probability and Statistics Applications	
STAT 371	Statistics for Engineers and Scientists I	
STAT 470	Probability: Theory and Applications	

Credits	14
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Third Year

Semester 1

C S 371	Software Development	4
Viewing a Wider World Course ³		3
BCIS 482	Management of Information Security	3
Upper-Division Elective Course ⁴		3
Mobile Computing and Wireless ⁶		3
C S 496	Cloud and Edge Computing (Recommended)	

Credits	16
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Semester 2

Viewing a Wider World Course ³		3
C S 478	Computer Security	3
CJUS 412	Introduction to Security Technology and Loss Prevention	3
C S 479	Special Topics (Software Reverse Engineering)	3
Elective Course ⁴		3

Credits	15
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Fourth Year

Semester 1

C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
C S 480	Linux System Administration	3
E T 339	Introduction to Digital Forensics and Incident Response	3
Elective Course ⁴		3

Credits	15
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Semester 2

C S 448	Senior Project	4
C S 380	Introduction to Cryptography	3
E E 458	Hardware Security and Trust	3

C S 484	Computer Networks I	3
Credits		13
Total Credits		119-120

¹ MATH 1511G Calculus and Analytic Geometry I or MATH 1430G Applications of Calculus I is the starting requirement for this degree but students may need to take prerequisites before enrolling.

**If a student tests into MATH 1521G Calculus and Analytic Geometry II then elective credits can replace this requirement in the roadmap.*

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Any course offered by the university. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ Students need to fill in one credit to meet the requirement of 15 credit hours.

⁶ This course does not have a course number yet. It will be offered as a special topic course in CS (C S 479 Special Topics or C S 579 Special Topics) or EE (E E 490 Selected Topics). The topic of the course must be Mobile and Wireless Computing.

Computer Science - Bachelor of Science/Master of Science

5 Year Dual Degree BS+MS Program

The dual degree program combines some of the requirements of the Bachelor of Science (BS) and the Master of Science (MS) in Computer Science. It is very important for the student to apply to the BS+MS program before they take any 400-level C S courses. Full details of the program can be found at <http://www.cs.nmsu.edu> (<https://www.cs.nmsu.edu>).

Admission occurs in two steps.

1. First, students will apply to the Computer Science department to receive approval for the BS+MS program. The student submits the pre-application when he/she is within 48 credits of earning a BS in Computer Science; an application form is provided on the department website. Qualification for the BS+MS program will be based on the cumulative (non-grade replaced) grade point average in Computer Science and Math courses taken up to that point (at least 3.5), including at least two of the following: C S 370 Compilers and Automata Theory, C S 371 Software Development and C S 372 Data Structures and Algorithms, and recommendations by faculty members listed on the departmental application. Additional factors might be taken into account when available (e.g., GRE scores). Students having a grade point average below 3.5 may be admitted to the combined program on a case-by-case basis, depending on faculty recommendations and evaluations of the individual academic and professional history.
2. Once the Computer Science department has notified the applicant of acceptance in the combined BS+MS program, the applicant must then formally apply to the graduate school (<https://apply.nmsu.edu/apply/?id=1c3c41ea-b5f9-48ef-83c3-b085794ba277>) for formal

admission to the graduate program. This application to the graduate school is made during the semester of graduation from the BS in Computer Science.

The curriculum for the first three years of the BS+MS program coincides with the requirements of the BS program. In particular; the general requirements include a grade of at least a C- in each course satisfying the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and non-departmental requirement. No course taken to satisfy either a departmental or non-departmental requirement may be taken S/U. The following are the departmental requirements for the degree (the non-departmental requirements are identical to those of the BS in Computer Science).

Prefix	Title	Credits
Departmental Requirements for Years 1 through 4		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 278	Discrete Mathematics for Computer Science	4
C S 370	Compilers and Automata Theory	4
C S 371	Software Development	4
C S 372	Data Structures and Algorithms	4
C S 419	Computing Ethics and Social Implications of Computing	1
C S 449	Senior Thesis	4
or C S 448	Senior Project	
C S 471	Programming Language Structure I	3
C S 474	Operating Systems I	3
C S 482	Database Management Systems I	3
Select one from the following:		3
C S 504	Computer Networks I	
C S 505	Artificial Intelligence I	
C S 506	Computer Graphics I	
C S 508	Introduction to Data Mining	
C S 509	Bioinformatics Programming	
C S 513	Computer Security	
C S 514	Introduction to Smart Grids	
C S 515	Human-Centered Computing	
C S 516	Bioinformatics	
C S 517	Digital Game Design	
C S 518	Visual Programming	
C S 519	Applied Machine Learning I	
C S 521	Parallel Programming	
C S 522	Cloud and Edge Computing	
Select one from the following:		3
C S 573	Architectural Concepts II	
C S 574	Operating Systems II	
C S 584	Computer Networks II	
Departmental Requirements for Year 5		
C S 510	Automata, Languages, Computability	3
C S 570	Analysis of Algorithms	3
One additional course numbered 550 or above		3
One additional course numbered 500 or above		3
C S 599	Master's Thesis ¹	6
or C S 598	Master's Project	
Select one from the following:		3

C S 575	Artificial Intelligence II	3
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
Select one from the following:		3
C S 573	Architectural Concepts II	76
C S 574	Operating Systems II	
C S 575	Artificial Intelligence II	
C S 581	Advanced Software Engineering	
C S 582	Database Management Systems II	
C S 584	Computer Networks II	
C S 586	Algorithms in Systems Biology	
Total Credits		76

¹ In order to fulfill the degree requirement, the student must complete a total of 6 credits for either course.

Algorithm Theory - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 372	Data Structures and Algorithms	4
Select 3-4 credits from the following:		3-4
C S 278	Discrete Mathematics for Computer Science	6-7
MATH 1531	Introduction to Higher Mathematics	
Select 6-7 credits from the following:		6-7
C S 370	Compilers and Automata Theory	25-27
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
MATH 377	Introduction to Numerical Methods	
MATH 454	Logic and Set Theory	
Total Credits		

Bioinformatics - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
C S 172	Computer Science I	4
C S 272	Introduction to Data Structures	4
C S 371	Software Development	4
C S 486	Bioinformatics	3
C S 489	Bioinformatics Programming	3
Select one from the following:		3
C S 482	Database Management Systems I	22-23
C S 491	Parallel Programming	
BIOL 305	Principles of Genetics	
CHEM 433	Physical Chemistry I	
MATH 331	Introduction to Modern Algebra	

PHYS 315	Modern Physics	25
Total Credits		

Computer Systems - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 273	Machine Programming and Organization	4
C S 370	Compilers and Automata Theory	4
or C S 371	Software Development	3
C S 473	Architectural Concepts I	
or C S 474	Operating Systems I	3
Select one from the following:		
C S 476	Computer Graphics I	26
C S 482	Database Management Systems I	
C S 484	Computer Networks I	
C S 480	Linux System Administration	
C S 491	Parallel Programming	
Total Credits		26

Software Development - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
C S 172	Computer Science I	4
C S 271	Object Oriented Programming	4
C S 272	Introduction to Data Structures	4
C S 371	Software Development	4
Select 6-7 credits from the following:		6-7
C S 370	Compilers and Automata Theory	22-23
C S 471	Programming Language Structure I	
C S 474	Operating Systems I	
C S 475	Artificial Intelligence I	
C S 476	Computer Graphics I	
C S 482	Database Management Systems I	
C S 484	Computer Networks I	
C S 485	Human-Centered Computing	
C S 491	Parallel Programming	
Total Credits		22-23

Creative Media Undergraduate Program Information

New Mexico State University’s Creative Media Institute (CMI) prepares students to become digital storytellers using state of the art, industry-standard tools. The Creative Media Institute is dedicated to developing and nurturing the artistic endeavors of student filmmakers through industry-standard education, research and collaboration in the art, craft and production of the moving image through storytelling, resulting in a Bachelor of Creative Media degree. The program provides learning opportunities for newly admitted NMSU students, and provides some

credit transfer opportunities for students with an associate degree from a NMSU community college or other two-year degree granting institution. The Bachelor of Creative Media provides a liberal arts background enabling students to pursue further education, professional training or employment in the digital media-based industry. Study in the CMI program fosters collaborative expression based on a clear understanding of media culture, history, design and practice. CMI also offers students the opportunity for internships in digital video, animation, visualization and simulation, industrial and educational video at varied production facilities on and off campus.

Theory and practice are integrated at every step as students manipulate text, sound and images using industry-standard technology. CMI houses a state of the art digital projection system screening room, post-production lab, animation lab, production space, motion capture laboratory and THX sound mixing theatre.

Due to limited capacity, new students wishing to continue in the CMI program after their freshman year are required to complete an application process. Transfer students from other institutions, including NMSU Community Colleges, must complete the application process. Transfer students should contact an Academic Advisor from the College of Arts and Sciences Advising Office for information about joining one of the two degree programs offered in CMI. Space is limited and varies each year. The quality of the student's work as demonstrated in the application and prior course work are additional criteria of the admission decision. Exact details and procedures for applying to the CMI program can be found on the CMI website at: cmi.nmsu.edu (<http://cmi.nmsu.edu>).

Graduate Program Information

Starting Fall 2022, the MFA Creative Writing Program will be housed in the Creative Media Institute as we work to expand course offerings to include screenwriting, playwriting and writing for new media. In Spring 2024, courses will change from the ENGL to the FDMA prefix.

The Master of Fine Arts Degree in Creative Writing is a 3-year program. Students choose a major genre: poetry or fiction, though classes in nonfiction, writing, screenwriting and others are offered. Students must complete 54 hours of graduate-level course work, submit a creative writing thesis, give a public reading from the thesis, and pass an oral examination.

Our mission is to emphasize the creation and critical analysis of literature, so that our students can be part of the national conversation about writing, graduating with a publishable manuscript. By providing our students with a set of skills, we prepare them to contribute to their communities as writers, publishing professionals and teachers.

Creative Writing - Master of Fine Arts

Students pursuing the MFA in Creative Writing devote themselves to concentrated study and development of a chosen genre: poetry or fiction. Students

- complete 54 hours of graduate-level coursework,
- present a book-length thesis of original work with an introduction or afterward,
- perform a public reading from the thesis, and
- pass an oral examination in the final semester.

A maximum of 12 credits in Form and Technique count for the degree.

Students wishing to apply to the MFA should consult application information on the Graduate School website (<https://apply.nmsu.edu/apply/>). Applications are due by February 1 for Fall admission to the MFA.

Support in the form of a Graduate Assistantships is awarded through a competitive selection process; this application is folded into the application for admission and should be submitted by the February 1 deadline. All Graduate Assistantships in Creative Writing begin in the Fall semester.

Degrees for the Department

Bachelors Degree(s)

- Animation and Visual Effects - Bachelor of Creative Media (p. 596)
- Digital Film Making - Bachelor of Creative Media (p. 599)

Master Degree(s)

- Creative Writing - Master of Fine Arts (p. 125)

Minors for the Department

Currently, the Animation and Visual Effects and Digital Filmmaking minors are closed to any students outside of the major. The minor in Creative Writing is open to all majors.

- Animation and Visual Effects - Undergraduate Minor (p. 600)
- Creative Writing - Undergraduate Minor (<http://catalogs.nmsu.edu/nmsu/arts-sciences/creative-media/creative-writing-ug-minor/>)
- Digital Film Making - Undergraduate Minor (p. 601)

Department Head, Amy Lanasa

Professors Bradburd, Greenfield, Lanasa, Voisine; **Associate Professors** Fowler, Lapid, Lau; **Assistant Professors** Chase, Hobson, Mannens, Marks, Rodgers, Yapyapan; **College Associate Professors** Bakshi; **College Assistant Professors** Swander; **College Instructor** Nirmalakhandan

Film & Digital Media Courses

FDMA 1210. Digital Video Production I 3 Credits (2+4P)

An introduction to digital video production. Students learn camera operation, lights and audio equipment. Hands-on production is completed in the studio and on location.

Learning Outcomes

1. Plan and produce a digital video project
2. Apply post-production workflow
3. Work in team and as individual to complete digital video projects.

FDMA 1220. Introduction to Digital Video Editing**3 Credits (3)**

In this course, students learn the basics of the post-production process for non-linear video editing. Students work with multiple video formats and create short movies for multiple distribution platforms. Skills include media management and professional terminology. Sections on the Main Campus will be restricted to CMI students.

Learning Outcomes

1. Define concepts related to digital video editing.
2. Use non-linear video editing software for editing a short film
3. Enhance storytelling through the use of continuity, timing, cutaways, intercutting, compositing, transitioning, jump cutting, montaging and animating.
4. Use text, titles, transitions, video effects, sound effects, dialogue, and visual assets for digital video editing.

FDMA 1415. Principles of Sound**3 Credits (2+2P)**

The creation of a professional quality original media soundtrack is possible for relatively low production/post production cost. This class is designed to give the student an overview of creating sound for a variety of digital media. Topics include acoustic principles, sound design, audio hardware, recording techniques; and editing, processing, and multi-track mixing, using software applications. Restricted to: Community Colleges only.

Prerequisite(s)/Corequisite(s): FDMA 1220.

Learning Outcomes

1. Record and edit wild sound effects and synced dialogue
2. Discover, upload, and edit on-line music, ambience and sound effect loops
3. Implement audio design theories
4. Create an aesthetic soundtrack which incorporates multiple elements and dimensions
5. Design, edit, process, mix and master a synced multi-track soundtrack
6. Demonstrate capable use of digital audio production and post-production workflow
7. Produce short audio projects which meet media industry technical standards

FDMA 1510. Introduction to 3D Animation**3 Credits (3)**

This course provides an overview of 3D animation production processes. Students will be introduced to basic story development and the creation of computer-generated assets and cinematic sequences. The course will survey specialty areas of digital animation and various software and techniques applied in entertainment and information media. Students will review and critique other's animation, as well as plan and produce original animation for review by classmates and as part of a CGI demo reel.

Prerequisite(s): FDMA 2382 or FDMA 2381 or consent of instructor.

Learning Outcomes

1. Demonstrate a fundamental understanding of 3D animation history and principles.
2. Analyze animation work of other artists.
3. Appropriately utilize the various media technologies for digital 3D animation.
4. Demonstrate and apply basic techniques of digital 3D animation.
5. Demonstrate and apply basic processes of creating CGI for a narrative.
6. Apply some basic strategies for developing and creating a story visually, and create original animations.
6. Present original animations to instructor and classmates for critique.
7. Create a CGI demo reel of work completed during the course.

FDMA 1555. Introduction to the Creative Media Industry**3 Credits (3)**

This class is an introductory course for students who are beginning their understanding of Media and how it affects them and our society. It offers a broad-stroked view of the entire industry including Marketing, Production, History, Jobs, Design, Architecture, New Media Literacy, and industry standards. Students will listen to experts in the field, get involved in open discussions about the industry and use new information to complete hands-on individual & group assignments.

Learning Outcomes

1. The basic philosophies and methods that guide people working in the Creative Media industry.
2. Knowledge of a wide variety of different jobs, qualifications and paradigms used in the industry.
3. Marketing, Production, Budgets, History, New Media, Inspiration and other aspects of the industry.
4. An accurate view of the Creative Media field.

FDMA 1715. 2-D Compositing & FX**3 Credits (3)**

This course will familiarize students with the process of compositing and creating special effects for animation using industry standard software. Students will learn how to assemble an animated scene and use advanced 3D lighting, spacing, and digital effects to achieve a dynamic, professionally rendered look.

Prerequisite: FDMA 2710.

Learning Outcomes

1. The goal of this class is for students to learn how to use advanced compositing and effects tools in order to achieve a more dynamic and professional visual look for their animations or motion graphics.
2. By the end of the class, you should be proficient animation compositors that can assemble and synthesize a basic animation into a rendered, visually sophisticated piece.
3. Students who pass this class will have a basic to intermediate knowledge of Adobe After Effects

FDMA 2310. History of Cinema I**3 Credits (3)**

This course surveys the history of cinema - investigating the process by which the original "cinema of attractions" evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, as well as many key international movements that helped shape it. Restricted to: G-CMI, DFM, ANVE majors.

Learning Outcomes

1. Gain a greater appreciation for the history of cinema
2. Develop knowledge of the key eras in the history of U.S. cinema
3. Learn the characteristics of major movements in international cinema
4. Understand the various elements that go into telling a story in cinema: screenplay, narrative devices, director, producer, talent, production design, cinematography, editing, sound design
5. Learn how major genres in U.S. cinema have evolved in the past 100+ years
6. Gain a basic understanding of the operations and organization of the Hollywood film industry, from the studio system until today
7. Gain an awareness of the shifts in the film industry that present new opportunities for independent filmmakers
8. Understand the importance of learning about the history of cinema to the process of becoming a filmmaker
9. Strengthen public speaking skills

FDMA 2311. History of Animation**3 Credits (3)**

Explores the history of Animation as an art form and industry through readings, screenings, lecture and periodic guest speakers. Restricted to: G-CMI, ANVE, DFM majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. To expand your knowledge of the history of animation and its evolution to the modern day.
2. To expand your ability to view animation critically and to understand its early connections to cartooning as well as its ongoing cultural presence and relevance.
3. To expand your comfort with accessing information and completing assignments both online and independently. Canvas will be utilized for many of our readings and for some response assignments.

FDMA 2381. Storyboarding**3 Credits (3)**

Examines effective writing principles to create storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Further, the purpose of this course is to introduce students to the principles of visual storytelling—in film—through the use of the storyboard. In other words, to show how storyboards are critical "architectural component" of the filmmaking process, used as a blueprint (or guide) to communicate the complex elements of a film story. Crosslisted with: ENGL 2381. Restricted to: DFM, ANVE, G-CMI majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Learn to conceive and draw original images.
2. Learn to use images to tell a story.
3. Design, develop, and order images (shots) into storyboarded scenes.
4. Understand how storyboarded sequences are a tool in the process of filmmaking.
5. Understand how the storyboard image is translated from the written page.
6. Build scenes from the scripted sequences into a storyboard.

FDMA 2382. Principles of Story Across the Media**3 Credits (3)**

The purpose of this course is to help students understand the basic elements of narrative structure (e.g. character, dramatic conflict, theme, etc.) and how these elements may be used effectively in media expression. Crosslisted with: ENGL 2382. Restricted to: G-CMI, DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify the elements of storytelling in scripted text or improvised performance
2. Understand how these elements work together across different media
3. Apply these elements of storytelling in original work
4. Appreciate and master these elements for independent or collaborative work

FDMA 2510. Introduction to Sound Design for Film**3 Credits (3)**

This course is an introduction to the principles, techniques and applications of sound design and film scoring. Students learn how sound affects storytelling in a film, examine the role of sound from the script to screen, and the professional process of creating a soundtrack. Students learn how to use sound equipment in a production environment and execute basic techniques used to develop a soundtrack. Crosslisted with: FDMA 1415.

Prerequisite(s)/Corequisite(s): FDMA 2382. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare the properties and propagation of sound and importance of sound to the storytelling aspect of filmmaking
2. Learn the process of designing a soundtrack for film and recording live audio dialogue for use in post-production editing.
3. Learn methods of capturing sound including live audio recording, dialogue recording, foley, orchestration and audio dialogue replacement
4. Design a soundtrack for motion media project.

FDMA 2520. Introduction to Cinematography**3 Credits (3)**

The Director of Photography (or Cinematographer), in close collaboration with the Director and Production Designer, helps determine the look of a film. This course is designed to introduce students to the technical and aesthetic fundamentals of creating, developing, and collaborating on the visual elements of storytelling, using camera framing, lensing, and lighting fundamentals such as shadows, light and color. May be repeated up to 6 credits. only. Prerequisite(s)/Corequisite(s): FDMA 2382 (Las Cruces Campus) or FDMA 1210 (Community College Campus(es))

Learning Outcomes

1. Define and explain the fundamental concepts of cinematography, such as exposure, lighting solutions, and color temperature.
2. Understand how cinematography brings the Director's vision to reality.
3. Demonstrate proficiency in plotting and executing interior and exterior lighting solutions.

FDMA 2530. Introduction to 3D Modeling**3 Credits (3)**

This course will introduce 3D modeling methods and current practices. Students will learn preliminary and detailed modeling techniques using industry standard software. Methods will emphasize formal and functional aspects of modeling as they apply to mechanical, organic, and sculpted topology for application in animation, games, and information media. May be repeated for a maximum of 6 credits.

Learning Outcomes

1. Identify the role of a 3D modeler in a production pipeline within various fields of digital animation.
2. Apply techniques in modeling mechanical and organic objects.
3. Utilize tools available in professional 3D modeling software.
4. Create simple animations and renders.
5. Present original animations to instructor and classmates for critique.
6. Create a demo reel of work completed during the course.

FDMA 2535. Digital Illustration Techniques**3 Credits (3)**

Introductory course examining traditional artistic expressions and translating visual art experiences into a digital art medium to enhance visual storytelling. Students acquire basic principles of drawing and painting through hands-on experience manipulating tonal value, composition, form development, light and shadow, color theory, rendering realism, and graphic design. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Be familiar with the CMI computer system, facilities, equipment and policies.
2. Appropriately utilize the various media technologies available at CMI for digital illustration.
3. Understand the different roles and areas of digital illustration.
4. Understand and apply some basic techniques of digital illustration.
5. Understand and apply some basic processes of creating pleasing images based on knowledge of traditional art principles.
6. Begin to apply some basic strategies for developing and creating aesthetically pleasing images.

FDMA 2710. Beginning 2-D Animation**3 Credits (3)**

Students will learn the basics of digital 2D animation by working through a variety of exercises, creating an original storyboard, and animating five or more shots utilizing industry standard software. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. The student will demonstrate an overall knowledge of computers as a tool of the animation artist and be able to produce simple animations using the techniques learned in class.
2. Use major software tools with ease
3. Manage time lines through key frames
4. Build storyboards
5. Demonstrate knowledge of 2-D and animation terminology
6. Produce actions, set environments and constraints for 2-D animation
7. Render full animation.

FDMA 2720. 3D Animation**3 Credits (3)**

Overview of the essentials and principles of 3D animation; creative methods for using industry standard tools to produce the illusion of movement for storytelling and creating 3D effects. Topics include, keyframe and curve animation, kinematics, cycle animation, camera animation, deformers, dynamics and constraints.

Prerequisite: FDMA 1510, FDMA 2710 or consent of instructor.

Learning Outcomes

1. Clearly describe the role of an animator in cinema, gaming and related fields.
2. Recognize leading animators and their methods.
3. Demonstrate knowledge of advances in contemporary animation.
4. Utilize current industry standard animation tools.
5. Apply fundamental animation processes and techniques

FDMA 2725. Rigging for 3D Animation**3 Credits (3)**

This course will introduce principles and practices of current 3D animation rigging. Students will develop fundamental methods necessary to create character rigs. Students will learn aesthetic, technical, and optimization concepts as they apply to organic and mechanical designs. Topics will include: hierarchies, constraints, deformation rigging, skeleton creation, skinning, forward and inverse kinematics, controls, body and facial rigging. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 1510.

Learning Outcomes

1. Understand what Rigging is and the role it plays in the world of cinema and video games.
2. Be familiar with industry professionals and their techniques and approaches to rigging.
3. Understand and be able to apply the fundamentals of rigging to industry standard applications.
4. Demonstrate ability to rig basic to intermediate machines, bipeds and quadrupeds

FDMA 2745. Light, Shade, Render**3 Credits (3)**

This course will explore the theory and practice of 3D lighting and rendering methodologies. Techniques covered will implement cameras, lighting sources, textures, surface-mapping and algorithmic rendering to produce stylized and photo realistic images. Topics covered will include direct and indirect lighting, shaders that simulate physical substances and effects, rendering multiple passes and simulating physical lens effects. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Prerequisite: FDMA 1510 OR FDMA 2530, or Consent of Instructor.

Learning Outcomes

1. Understand the role of lighting and surfacing to tell a story.
2. Be familiar with leading lighting artist and their approaches.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental lighting and rendering techniques.
5. Demonstrate ability to create successfully rendered scenes from concept through production.

FDMA 2755. Drawing for Animation**3 Credits (3)**

Introductory study of the human and animal form in relation to animation. Students learn fundamentals and exaggeration of the figure, as related to proportion, rhythm, mechanics, and motion. Areas of focus are: basic form, proportion, shape, contour, gesture, anatomy, portraiture, perspective, clothing effects and drawing from observation. Restricted to: CMT, DFM, ANVE majors.

Learning Outcomes

1. Students will have an opportunity to gain hands on experience using industry standard state of the art animation software.
2. Understand what the basics of drawing the human form.
3. Have a general understanding of human anatomy as needed for the artist.
4. Be able to design the human form from imagination.

FDMA 300. History of Cinema II**3 Credits (3)**

An advanced, in-depth analysis of cinema's history. Course may focus on one specific area of cinema history depending on instructor.

Prerequisite(s)/Corequisite(s): FDMA 2382, FDMA 2310. Restricted to: DFM, ANVE, G-CMI majors. Restricted to Las Cruces campus only.

FDMA 301. Sound Design II**3 Credits (3)**

Mixing and balancing dialogue, sound effects and music in postproduction. Study the role of sound effects, foley, soundtrack choices, and music supervision. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2510.

FDMA 303. Cinema Review and Critique**3 Credits (3)**

This course is for the student who wants to learn to be a more active, intelligent film viewer. It encourages critical thinking about films and educates students on how to write a film review. Students will meet in the movie theater to watch essential films that serious movie watchers should see from classic motion pictures, to current release major motion pictures, independent films and world cinema features. The course will serve as a guide to the illuminating process of evaluating, analyzing, and reviewing movies. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2382.

FDMA 305. Business of Filmmaking/Animation**3 Credits (3)**

Explores the roles of unions, basic contracts, legal arrangements, and the economics of the production process, distribution, and financing. Consent of Instructor required.

Prerequisite(s): FDMA 2382.

FDMA 308. Writing for Animation**3 Credits (3)**

This class explores methods for, and approaches to, writing for animation. Students study and produce scripts for a range of animation outlets while engaging in writing exercises based on character and story development.

Prerequisite(s): FDMA 2382 or consent of instructor.

FDMA 309. Screenwriting I**3 Credits (3)**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Crosslisted with: ENGL 309 and THEA 306.

Prerequisite(s): ENGL 2382/FDMA 2382 or consent of instructor.

FDMA 310. Cinematography II**3 Credits (3)**

Advanced tools of the cinematographer, lighting and composition techniques. Artistic and technological elements of cinematography. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2520.

FDMA 311. Editing II**3 Credits (3)**

Advanced techniques in digital films using professional non-linear editing systems. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 1220.

FDMA 312. Post Production Color Grading**3 Credits (3)**

Color grading is an important part of the overall look of a film. It used to be a craft that only a small number of people knew how to do. However, due to advances in technology and business models, more and more people are diving into color grading. This class is an introductory look into the art and techniques of color grading. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 1220.

FDMA 314. Acting for Film**3 Credits (3)**

Techniques for film and television acting. In-depth analysis of film performance creation among actor, director, writer, cinematographer, and editor. Restricted to: THTR, DFM majors.

Prerequisite(s): FDMA 2382.

FDMA 315. Adventures in Genre**3 Credits (3)**

Students learn storytelling strategies for the screen by studying various structural genres and components of screenplays and films. Utilizing these strategies, students develop a number of their own original screenplay ideas. Additionally, pitch workshops are held and students learn to present their ideas in various, practical situations.

Prerequisite(s): FDMA 2382 and FDMA 309.

FDMA 316. Border Cinema Around the World**3 Credits (3)**

What is the relationship between borders, identity, and vulnerability - and how is this relationship explored in cinema? How are borderlands also testing grounds - the sites of serious ethical dilemmas? By examining powerful feature films from such regions as the Middle East, the Balkans, and the US/Mexico border, we will explore ways in which personal, familial, communal, and national identities are defined through the complex process of bordering. We will investigate the role of cinema in reflecting and/or facilitating this process.

FDMA 318. Documentary Production**3 Credits (3)**

Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.

Prerequisite(s): FDMA 1220, FDMA 2520.

FDMA 320. Race and Gender in Film**3 Credits (3)**

In this course students will analyze film as an art form as well as be exposed to Race and Gender Feminist Film Theory. We will consider the role of film in our understandings of sex, gender and sexuality. Through discussions and writing we will work to discern relevant social, political, ideological, and aesthetic concepts in the media we examine. Crosslisted with: ENGL 399, GNDR 450 and GNDR 550.

FDMA 325. Film Festival Production**3 Credits (3)**

A course for students interested in learning about the processes of orchestrating an independent film festival. Students will engage in a professional environment with other film students and filmmakers, as well as learn about film event administration and organization. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

FDMA 328. Producing**3 Credits (3)**

Examines the role of the Producer, essential to every film production. The course will revolve around the best practices in organizational design, the production process, the budgeting process, financial controls, scheduling, insurance and distribution.

Prerequisite(s)/Corequisite(s): FDMA 2510, FDMA 1220, FDMA 2382. Restricted to: ANVE, DFM majors.

FDMA 332. 3D Character Animation**3 Credits (3)**

Essentials and principles of 3D character animation. Techniques and craft of breathing life into characters through movement, including dynamic poses, blocking action, run and walk cycles, lip synching and realism. Students will plan and produce original animation for review by classmates and as part of a CGI demo reel. THEA 1221, Acting and FDMA 2510, Sound Design are recommended. Restricted to: DFM, ANVE majors.

Prerequisite: THEA 1210 (or FDMA 314 or FDMA 348), FDMA 1510 and FDMA 2720 or consent of instructor.

Learning Outcomes

1. Understand the character animation pipeline.
2. Understand basic body mechanics and how to represent them with a 3D character
3. Understand the twelve principles of animation on a deeper level and be able to apply them in individual work
4. Developing a vocabulary and critical eye in order to critique each other's work.

FDMA 341. Visual Effects I**3 Credits (3)**

This course will educate students on the fundamental principles, skills, and artistry needed to successfully integrate live action footage and computer generated imagery into technically correct and narrative engaging cinematic shots. Topics include: Cinematography for visual effects; Green screen setup/lighting/keying; Intermediate compositing techniques; Editing, color correction and grading. Restricted to ANVE, DFM Majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530, FDMA 2745 (or consent of instructor).

Learning Outcomes

1. At the end of this class, students will produce (alone or in a group), an engaging, well-thought out and professionally executed visual story from scratch - using a combination of live action plates, green screen elements and seamlessly integrated CGI elements.
2. Students will become fluent in setting up and operating a professional camera proper cinematography techniques.
3. Students will shoot green screen elements/plate using proper cinematography techniques.
4. Students will become fluent in editing software to edit an engaging narrative.
5. Students will become fluent in node-based compositing software to produce seamless, photoreal integrations of CGI elements and green screen mattes in live action plates.
6. Students will use color-correction and color grading techniques and use color as a narrative element.
7. Students will correctly adhere to established production standards and protocols.

FDMA 348. Acting for Animation**3 Credits (3)**

This course explores performance techniques relevant to animators including 2D and 3D animation and motion capture. Students learn to create dynamic, dramatic performances and believable character interactions for animation based reference. Students learn to analyze scripts, sound, acting, action and performance for production. Topics include: acting theory, emotional/mental states, character movement and style, dynamic facial expression, scene construction, posing, layering and rhythm, simplification and exaggeration, and lip sync. Restricted to: ANVE, DFM majors. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the different roles and character mindsets of digital animation in cinema.
2. Understand and apply some basic acting skills into animation reference.
3. Understand and apply some basic processes of creating reference for a narrative.
4. Begin to apply some basic strategies for developing and creating a story visually.

FDMA 350. Intermediate 2D Animation**3 Credits (3)**

Students will begin to refine their animation skills by animating more complex characters utilizing the Principles of Animation. They will practice these advanced drawing and motion techniques in a variety of exercises and projects using industry standard software. Areas of focus include: squash and stretch, cloth simulation, the successive breaking of joints, and biped walk cycles. May be repeated up to 3 credits.

Prerequisite: FDMA 2710.

Learning Outcomes

1. Students will refine foundational animation skills.
2. Students will learn and show proficiency in related industry-standard software.
3. Students will apply skills to more advanced projects than in previous 2D courses

FDMA 360. Previsualization**3 Credits (3)**

Implements 3D animation tools in preproduction shot and sequence design for motion picture and broadcast industries; including 3D storyboarding, technical planning and editing basics. LC Campus Only. Restricted to ANVE, DFM majors.

Prerequisite(s): FDMA 1510, FDMA 2530, and FDMA 2720 or consent of instructor.

FDMA 362. Motion Graphics**3 Credits (3)**

Students will learn the industry standard motion graphics techniques through a variety of exercises and projects that combine animation, text, visual effects, and sound. Restricted to: ANVE, DFM majors.

Prerequisite: FDMA 1715.

Learning Outcomes

1. Understand the context for and learn to create, combine, and animate text with graphics.
2. Explore various applications of creative techniques, including motion graphic design for commercials, logos, informative videos, UI design, and basic character rigging.
3. Learn to use industry-standard motion graphic softwares.

FDMA 365. Character Design and Development**3 Credits (3)**

Digital character design for the entertainment industry. Provides insight into the process of creating iconic characters. Traditional and contemporary character designers are explored. Industry workflow is introduced and necessary skills are developed to design detailed 3D characters from concept through production. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530 and FDMA 2535, or consent of instructor.

Learning Outcomes

1. Understand the role of a character in cinema and gaming.
2. Become familiar with leading character designers and their approach.
3. Utilize current industry standard methods.
4. Understand and apply fundamental character design techniques.
5. Demonstrate a strong ability to design and create characters from concept through production.

FDMA 377. Game Design Workshop**3 Credits (3)**

In this course we will learn to design, develop, and playtest games. This approach will be exercise driven and involve nontechnical approaches as well as digital production techniques. This playcentric approach will involve player participation from conception through production. We will explore the iterative processes of prototyping, playtesting, and revising based on feedback. Consent of Instructor required. Restricted to: ANVE, DFM majors.

FDMA 395. Directing I**3 Credits (3)**

Study and application through short scene work of the basic tools of a director and relationships with actors, designers, playwright, and stage managers. Interpreting as well as organizing. May be repeated up to 3 credits. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2510, AND FDMA 2520, AND FDMA 1220.

FDMA 396. Directing II**3 Credits (3)**

Addresses pre-production concerns including script breakdown, casting ground plans and coverage. The criteria employed when selecting the creative team including a director of photography, art director, light, sound and wardrobe designers. Introduction to budgeting, scheduling, and script breakdowns. Prerequisite: FDMA 395

FDMA 397. Practicum**1-3 Credits (1-3)**

Practical application of the student's field of study in a project environment. May be repeated up to 9 credits. Consent of Instructor required.

FDMA 398. Special Topics**3 Credits (3)**

This course addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. May be repeated up to 12 credits.

FDMA 400. Directed Studies**1-6 Credits (1-6)**

Directed study course in CMI under the supervision of a CMI faculty member. May be repeated up to 9 credits.

FDMA 401. Motion Capture Techniques**3 Credits (3)**

Students will implement industry standard motion capture techniques and essential skills to capture and integrate performance for movie making, 3D animation and game production. Students will learn how to use the motion capture system, equipment and workflow, and polish performances using industry standard software. Concepts covered will consist of exploring motion capture setup, shooting, data tracking, and animation correction and enhancement. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2720 and FDMA 2725 (or consent of instructor).

Learning Outcomes

1. Understand and demonstrate basic approaches to integrating live actors with computer generated imagery.
2. Understand the role of motion capture in cinema, advertising and related fields.
3. Build familiarity with leading motion capture companies and their approaches.
4. Become knowledgeable of the history of motion capture.
5. Become knowledgeable of current advances in motion capture.
6. Learn to utilize industry standard motion capture software.
7. Demonstrate a strong ability to produce believable imagery from concept through final production.

FDMA 410. Cinematography III**3 Credits (3)**

This class is geared towards those who want to learn more about cinematography, color grading, and digital technology as it pertains to cinematography. Shooting high-end codecs (ProRes/DNxHD) or RAW are becoming more and more popular in filmmaking as camera manufactures and computer processing get better. This class will be a mix of production and post-production as learning how to shoot these higher end codecs do not end with the camera. Focus will be on techniques of shooting raw, understanding how to operate a camera capable of high end image acquisition, properly building up the camera rig and accessories, managing data and the post-production workflow. Consent of Instructor required. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 310.

FDMA 412. Advanced Equipment Training**3 Credits (3)**

This class is designed for students who want to dive deep into building and operating much of our advanced camera and G&E equipment. Though these on-set tasks are performed by below-the-line crew members, having the knowledge of and ability to use this equipment will serve you greatly as a DP. We will go over a wide variety of devices in this class, ranging from car mounts and our GlideCam to our large jib, 3-axis gimbal, 500-amp generator, and 6K HMI lights. We will also do some advanced lighting scenarios. The goal of this class is to get you "certified" on all the above items, resulting in your being able to build this equipment for other CMI sets, such as the Mixed Class Productions, Senior Projects, etc. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 310.

FDMA 425. Film Festival Production**3 Credits (3)**

This course is designed to enhance student knowledge about film festivals and, specifically, the Las Cruces International Film Festival. From soup to nuts, students will build upon what they learned in CMI 325 Film Festival Preparation regarding how to manage and execute a major film festival, including film solicitation and submissions, festival event marketing, celebrity appearances, industry workshops, filmmaker coordination and brand management. Students will gain an appreciation of the value of a film festival to the community and for visiting filmmakers. Students will apply this knowledge in their written assignments, film evaluations, and departmental responsibilities. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 325.

FDMA 433. Sets and Environments**3 Credits (3)**

Digital environment design and creation for movies and games from concept to production; including illustration, modeling, matte painting, texturing, lighting, rendering, integration, and camera projection. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530, and FDMA 2535 or consent of instructor.

Learning Outcomes

1. Understand the role of digital production design in cinema.
2. Become familiar with the work of leading digital artists involved in production design for the entertainment and gaming industries.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental digital set design techniques.
5. Demonstrate a strong ability to design and create digital set and environments from concept through production.

FDMA 450. Advanced 2D Animation**3 Credits (3)**

This course will cover the more advanced aspects of 2D Animation. Students will demonstrate their mastery of the principles of animation through a variety of exercises and projects focusing on: automated and manual lip sync, full motion character animation, acting, smears, and quadruped animation. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 350.

Learning Outcomes

1. Students will gain experience mastering Disney's Principles of animation.
2. Students will complete exercises to animate both humans and animals.
3. Students will gain proficiency in lip syncing and acting using industry standard software.

FDMA 477. Digital Game Design**3 Credits (3)**

This course covers the theory and practice of digital game production using industry standard media and game engine applications. Students apply animation and game development approaches toward gameengine constraints and requirements to create gameplay experiences. Design and production methods are implemented to create game levels and populate them with original assets. Team based game prototyping will require multiple disciplines to devise unique digital game experiences. Consent of Instructor required. Restricted to: ANVE, DFM majors.

Prerequisite(s): FDMA 377.

FDMA 480. Screenwriting II**3 Credits (3)**

Students will write 2 short scripts, 10-15 pages each throughout the semester. Focus will be on learning how to take notes and rewrite. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Restricted to ENGL, DFM, ANVE majors. Crosslisted with: ENGL 480

Prerequisite(s): ENGL 309 or FDMA 309 or THEA 306 or consent of instructor.

FDMA 490. Advanced Screenwriting**3 Credits (3)**

Students will prepare a 30-60 page screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. This course is aimed at preparing writers for the professional market. Consent of instructor required. May be repeated up to 6 credits.

FDMA 491. 3D Production Studio I**6 Credits (6)**

The course is the first semester of a year-long effort to complete a culminating project that is a story-driven short film, which can be either full CGI, or live action with visual effects. In Production Studio I the emphasis will be on the pre-production phase, including analysis and critique, pipeline organization and project management. Pre-production consists of: Pitch, Script, Visual and sound references, Storyboards, 3D Previsualization, Scheduling/Project Management. Restricted to ANVE majors.

Prerequisite: FDMA 308 or FDMA 309, FDMA 341.

Prerequisite/Corequisite: FDMA 332, FDMA 360, FDMA 365, FDMA 433.

Learning Outcomes

1. Demonstrate an ability to create a transformational story.
2. Exhibit proficiency in visual storytelling, structure, and character development.
3. Develop a story appropriate to the chosen production approach.
4. Create storyboards/animations to direct the cinematic aspects of the story.
5. Design the production visually in terms of characters and environment.
6. Learn to implement critiques of work to improve production quality.

FDMA 492. 2D Production Studio I**6 Credits (6)**

Students will work through the pre-production process on short animated films. They will write a script, create a storyboard, and record voice over/ dialogue to create an animatic. Additional exercises will then be assigned to augment the skill set of the student according to the needs of each student. Restricted to ANVE majors.

Prerequisite: FDMA 1715 and FDMA 450.

Learning Outcomes

1. Students will synthesize animation techniques to produce a completed animatic.
2. Students will show proficiency in storytelling towards the development of a short script for production.
3. Students will demonstrate proficiency in industry standard animation softwares and production practices.

FDMA 493. 3D Production Studio II**6 Credits (6)**

The course is the final semester of a year-long concentration on a culminating project. Emphasis will be on the production, post-production, and distribution of the work created during 3D Production Studio I. Students will produce a professional quality and industry-standard visual story that will help them gain entry into professional employment. The overall objective is for students to execute their artistic vision with exceptional creative and technical proficiency - resulting in a story-driven and captivating cinematic experience. Restricted to ANVE majors.

Prerequisite: FDMA 491.

Learning Outcomes

1. Students will complete the process of transforming their story from script to screen.
2. Students will demonstrate mastery of craft as a digital artist.
3. Students will learn to direct the cinematic aspects of the story.
4. Students will show proficiency in the production workflow, and complete a deliverable short film by the end of the production schedule.

FDMA 494. 2D Production Studio II**6 Credits (6)**

Students will produce the short animated films they developed in 2D Production Studio I. They will animate, composite, and edit their shorts into a final piece for presentation in a showcase. Restricted to ANVE majors.

Prerequisite: FDMA 492.

Learning Outcomes

1. To complete a final project (either short film or demo reel) that demonstrates synthesis of animation techniques taught in earlier classes.
2. To translate animatics from 2D Production Studio I into keyframes and then in-between their keyframes to get clean, smooth animations.

FDMA 495. Internship**1-12 Credits (1-12)**

Placement in a production facility and supervised experience required. With CMI advisor approval only. May be repeated up to 18 credits. Consent of Instructor required. Restricted to: DFM, ANVE majors.

FDMA 497. Portfolio Design and Development**3 Credits (3)**

Advanced graphic design projects with an emphasis on conceptual development, portfolio preparation, and professional practices. Refine general marketing strategies, personal portfolio, and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional/demo packages. Restricted to: DFM, ANVE majors.

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Animation and Visual Effects - Bachelor of Creative Media

The Creative Media Institute's Bachelor of Creative Media with an emphasis in Animation & Visual Effects currently offers 2 different paths, determined by the kind of senior project students wish to produce.

Pathway: 2D Production Studio

Students must complete all university requirements and the Animation and Visual Effects curriculum outlined below. All Animation and Visual Effects Curriculum requirements must be completed with a grade of C- or higher.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
Area II: Mathematics ^{1,2}		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		
THEA 1210G	Acting for Non-Majors	3
General Education Elective ¹		3-4

Viewing a Wider World ³		6
Departmental/College Requirements		
ANVE Core Courses		
FDMA 1510	Foundations of 3D Animation	3
FDMA 2311	History of Animation ⁴	3
FDMA 2381	Storyboarding	3
or ENGL 2381	Storyboarding	
FDMA 2382	Principles of Story Across the Media ⁴	3
or ENGL 2382	Narrative: Principles of Story Across the Media	
FDMA 2530	Introduction to 3D Modeling	3
FDMA 2535	Digital Illustration Techniques	3
FDMA 2710	Beginning 2D Animation	3
FDMA 308	Writing for Animation	3
or FDMA 309	Screenwriting I	
2D Production Studio Pathway Courses		
FDMA 1715	2-D Compositing & FX	3
FDMA 2755	Drawing for Animation	3
FDMA 303	Cinema Review and Critique	3
FDMA 348	Acting for Animation	3
FDMA 350	Intermediate 2D Animation	3
FDMA 362	Motion Graphics	3
FDMA 365	Character Design and Development	3
or FDMA 433	Sets and Environments	
FDMA 450	Advanced 2D Animation	3
FDMA 492	2D Production Studio I	6
FDMA 494	2D Production Studio II	6
Second Language Requirement: (not required)		0
Electives, to bring the total credits to 120 ⁵		19-22
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Required Pre-Application class for ANVE

⁵ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Creative Media with a major in Animation and Visual Effects, there is no second language requirement for the degree.

Pathway: 3D & VFX Production Studio

Students must complete all university requirements and the Animation and Visual Effects curriculum outlined below. All Animation and Visual Effects Curriculum requirements must be completed with a grade of C- or higher.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48

credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
	<i>English Composition - Level 1</i> ¹	
	<i>English Composition - Level 2</i> ¹	
	<i>Oral Communication</i> ¹	
<i>Area II: Mathematics</i> ^{1,2}		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>10-11</i>
	<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹	
	<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹	
	<i>Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 credits or 3 credits)</i> ¹	
<i>Area V: Humanities</i> ¹		<i>3</i>
<i>Area VI: Creative and Fine Arts</i> ¹		
THEA 1210G	Acting for Non-Majors (ANVE Core Course)	3
<i>General Education Elective</i> ¹		<i>3-4</i>
Viewing a Wider World ³		6
Departmental/College Requirements		
<i>ANVE Core Courses</i>		
FDMA 1510	Foundations of 3D Animation	3
FDMA 2311	History of Animation ⁴	3
FDMA 2381	Storyboarding	3
or ENGL 2381	Storyboarding	
FDMA 2382	Principles of Story Across the Media ⁴	3
or ENGL 2382	Narrative: Principles of Story Across the Media	
FDMA 2530	Introduction to 3D Modeling	3
FDMA 2535	Digital Illustration Techniques	3
FDMA 2710	Beginning 2D Animation	3
FDMA 308	Writing for Animation	3
or FDMA 309	Screenwriting I	
<i>3D & VFX Production Studio Pathway Courses</i>		
FDMA 2720	3D Animation	3
FDMA 2725	Rigging for 3D Animation	3
FDMA 2745	Light, Shade, Render	3
FDMA 332	3D Character Animation	3
FDMA 341	Visual Effects I	3
FDMA 360	Previsualization	3
FDMA 365	Character Design and Development	3
FDMA 433	Sets and Environments	3
FDMA 401	Motion Capture Techniques	3
FDMA 491	3D Production Studio I	6
FDMA 493	3D Production Studio II	6
Second Language Requirement: (not required)		0
Electives, to bring the total credits to 120 ⁵		16-19
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Required Pre-Application class for ANVE

⁵ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Creative Media with a major in Animation and Visual Effects, there is no second language requirement for the degree.

2D Production Studio Pathway

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
English Composition - Level 1 Course ^{1,2}		4
ENGL 1110G	Composition I (recommended)	
Area II: Mathematics ^{1,2}		3-4
MATH 1130G	Survey of Mathematics (recommended)	
FDMA 2311	History of Animation (C- or better) ³	3
FDMA 2382	Principles of Story Across the Media (B- or better) ³	3
or ENGL 2382	or Narrative: Principles of Story Across the Media	
Area III: Laboratory Sciences Course ²		4
Area V: Humanities Course ²		3
THEA 1210G	Acting for Non-Majors	3
FDMA 2381	Storyboarding	3
or ENGL 2381	or Storyboarding	
FDMA 2755	Drawing for Animation	3
Elective Course ⁴		1
Credits		30-31

Sophomore

General Education Elective Course ²		3-4
English Composition - Level 2 Course ²		3
Choose one from the following:		
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
FDMA 2535	Digital Illustration Techniques	3
FDMA 348	Acting for Animation	3
FDMA 2530	Introduction to 3D Modeling	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course ²		3-4
Oral Communications Course		3
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	

FDMA 1510	Foundations of 3D Animation	3
FDMA 2710	Beginning 2D Animation	3
Elective Course ⁴		3
Credits		30-32
Junior		
Viewing A Wider World Courses ⁵		6
FDMA 1715	2-D Compositing & FX	3
FDMA 350	Intermediate 2D Animation	3
FDMA 308 or FDMA 309	Writing for Animation or Screenwriting I	3
FDMA 365 or FDMA 433	Character Design and Development or Sets and Environments	3
Area IV: Social/Behavioral Sciences Course ²		3
FDMA 362	Motion Graphics	3
FDMA 450	Advanced 2D Animation	3
Elective Course ⁴		3
Credits		30
Senior		
FDMA 492	2D Production Studio I	6
FDMA 303	Cinema Review and Critique	3
FDMA 494	2D Production Studio II	6
Elective Courses ⁴		15
Credits		30
Total Credits		120-123

¹ These courses must be taken with a C- of better

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Required Pre-Application class for ANVE

⁴ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

3D & VFX Production Studio Pathway

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
English Composition - Level 1 Course ^{1,2}		4
ENGL 1110G	Composition I (recommended)	
Area II: Mathematics ^{1,2}		3-4
MATH 1130G	Survey of Mathematics (recommended)	
FDMA 2311	History of Animation (C- or better) ³	3

FDMA 2382 or ENGL 2382	Principles of Story Across the Media (B- for either) ³ or Narrative: Principles of Story Across the Media	3
Area III: Laboratory Sciences Course ²		4
Area V: Humanities Course ²		3
THEA 1210G	Acting for Non-Majors	3
FDMA 2381 or ENGL 2381	Storyboarding or Storyboarding	3
FDMA 2530	Introduction to 3D Modeling	3
Elective Course ⁴		1
Credits		30-31

Sophomore

English Composition - Level 2 Course ²		3
Choose one from the following:		
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
FDMA 1510	Foundations of 3D Animation	3
FDMA 2535	Digital Illustration Techniques	3
FDMA 2710	Beginning 2D Animation	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course ²		3-4
General Education Elective Course ²		3-4
Oral Communication Course		3
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
FDMA 2745	Light, Shade, Render	3
FDMA 2720	3D Animation	3
FDMA 433	Sets and Environments	3
Credits		30-32

Junior

FDMA 2725	Rigging for 3D Animation	3
FDMA 332	3D Character Animation	3
FDMA 365	Character Design and Development	3
FDMA 341	Visual Effects I	3
FDMA 308 or FDMA 309	Writing for Animation or Screenwriting I	3
Viewing A Wider World Courses ⁵		6
Area IV: Social/Behavioral Sciences ²		3
FDMA 360	Previsualization	3
FDMA 401	Motion Capture Techniques	3
Credits		30
Senior		
FDMA 491	3D Production Studio I	6
FDMA 493	3D Production Studio II	6
Elective Courses ⁴		18
Credits		30
Total Credits		120-123

¹ These courses must be taken with a C- of better

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Required Pre-Application class for ANVE

⁴ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Digital Film Making - Bachelor of Creative Media

Students must complete all university requirements and the Digital Film Making curriculum outlined below. All Digital Film Making Curriculum requirements must be completed with a grade of C- or higher.

Requirements

Prefix	Title	Credits
<i>Area I: Communications</i>		<i>10</i>
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ^{1,2}		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i> ¹		<i>10-11</i>
Area III: Laboratory Sciences Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course (4 credits or 3 credits)		
<i>Area V: Humanities</i> ¹		<i>3</i>
<i>Area VI: Creative and Fine Arts</i> ¹		<i>3</i>
<i>General Education Elective</i> ¹		<i>3-4</i>
Viewing a Wider World ³		6
Departmental/College Requirements		
<i>Foundation Courses</i>		
FDMA 1555	Introduction to the Creative Media Industry ⁴	3
FDMA 2510	Introduction to Sound Design for Film	3
or FDMA 1415	Principles of Sound	
FDMA 2520	Introduction to Cinematography	3
or FDMA 1210	Digital Video Production I	
FDMA 1220	Introduction to Digital Video Editing ⁵	3
FDMA 2382	Principles of Story Across the Media ⁴	3
or ENGL 2382	Narrative: Principles of Story Across the Media	
FDMA 2310	History of Cinema I	3
FDMA 303	Cinema Review and Critique	3
or ENGL 303	Theory and Criticism: Film, Media and Culture	
or ENGL 326	Cultural Identity and Representation Across the Media	
FDMA 314	Acting for Film	3
or THEA 311	Acting for Film and Television	
FDMA 328	Producing	3
or FDMA 305	Business of Filmmaking/Animation	
FDMA 497	Portfolio Design and Development	3
<i>FDMA Elective Courses</i>		
Select 27 credits from the following (21 credits must be 300 level and above): ⁶		27
FDMA 2311	History of Animation	
FDMA 2381	Storyboarding	

or ENGL 2381	Storyboarding
FDMA 2710	Beginning 2D Animation
FDMA 1510	Foundations of 3D Animation
FDMA 2120	Film Crew I/ Introduction to Film and Media Workflow ⁶
FDMA 2125	Film Crew II ⁶
FDMA 1210	Digital Video Production I ⁶
FDMA 2210	Digital Video Production II ⁶
FDMA 2285	Digital Video Production and Editing II ⁶
FDMA 2144	Pre-production Management ⁶
FDMA 300	History of Cinema II
FDMA 301	Sound Design II
FDMA 305	Business of Filmmaking/Animation
FDMA 308	Writing for Animation
FDMA 309	Screenwriting I
FDMA 310	Cinematography II
FDMA 311	Editing II
FDMA 315	Adventures in Genre
FDMA 316	Border Cinema Around the World
FDMA 318	Documentary Production
FDMA 320	Race and Gender in Film
FDMA 341	Visual Effects I
FDMA 395	Directing I
FDMA 396	Directing II
FDMA 397	Practicum
FDMA 398	Special Topics
FDMA 400	Directed Studies
FDMA 410	Cinematography III
FDMA 480	Screenwriting II
FDMA 490	Advanced Screenwriting
FDMA 495	Internship

Second Language Requirement: (not required)

Electives: to bring the total to 120 credits ⁷ **25**

Total Credits **120-123**

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Required pre-application course for DFM

⁵ Course may be taken at an NMSU community college.

⁶ See course descriptions in the designated community college campuses.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Creative Media with a major in Digital Film Making there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
English Composition - Level 1 Course ¹		4
ENGL 1110G	Composition I (recommended)	
Area II: Mathematics Course ¹		3-4
MATH 1130G	Survey of Mathematics (recommended)	
FDMA 1555	Introduction to the Creative Media Industry (B- or better)	3
FDMA 2382 or ENGL 2382	Principles of Story Across the Media (B- or better) or Narrative: Principles of Story Across the Media	3
Oral Communication Course		3
Select one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Sciences Course ³		4
Area IV: Social/Behavioral Sciences Course ³		3
Area V: Humanities Course ³		3
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course ³		3-4
Elective Course ²		1
Credits		30-32
Sophomore		
English Composition - Level 2		3
Choose one from the following:		
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
General Education Elective Course ³		3-4
FDMA 2510 or FDMA 1415	Introduction to Sound Design for Film or Principles of Sound	3
FDMA 2520 or FDMA 1210	Introduction to Cinematography or Digital Video Production I	3
FDMA 1220	Introduction to Digital Video Editing	3
Area VI: Creative and Fine Arts ³		3
FDMA 2310	History of Cinema I	3
FDMA Elective Courses ⁴		6
Elective Courses ²		3
Credits		30-31
Junior		
Viewing A Wider World Courses ⁵		6
FDMA 314 or THEA 311	Acting for Film or Acting for Film and Television	3
Choose one from the following:		3
FDMA 303	Cinema Review and Critique	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 326	Cultural Identity and Representation Across the Media	

FDMA 328 or FDMA 305	Producing or Business of Filmmaking/Animation	3
FDMA Elective Course (Upper-Division) ⁴		9
Elective Course ²		6
Credits		30
Senior		
FDMA 497	Portfolio Design and Development	3
FDMA Elective Courses (Upper-Division) ⁴		12
Elective Courses ²		15
Credits		30
Total Credits		120-123

¹ These courses must be taken with a C- or better

² Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ **FDMA Elective Courses:**

Las Cruces Campus Courses

- FDMA 2311 History of Animation, FDMA 2381 Storyboarding, FDMA 2710 Beginning 2D Animation, FDMA 1510 Foundations of 3D Animation, FDMA 300 History of Cinema II, FDMA 301 Sound Design II, FDMA 305 Business of Filmmaking/Animation, FDMA 308 Writing for Animation, FDMA 309 Screenwriting I, FDMA 310 Cinematography II, FDMA 311 Editing II, FDMA 315 Adventures in Genre, FDMA 316 Border Cinema Around the World, FDMA 318 Documentary Production, FDMA 320 Race and Gender in Film, FDMA 341 Visual Effects I, FDMA 395 Directing I, FDMA 396 Directing II, FDMA 397 Practicum, FDMA 398 Special Topics, FDMA 400 Directed Studies, FDMA 410 Cinematography III, FDMA 480 Screenwriting II, FDMA 490 Advanced Screenwriting, FDMA 495 Internship,
- ENGL 2381 Storyboarding

Community College Courses

- FDMA 2120 Film Crew I/ Introduction to Film and Media Workflow, FDMA 2125 Film Crew II, FDMA 1210 Digital Video Production I, FDMA 2210 Digital Video Production II, FDMA 2285 Digital Video Production and Editing II, FDMA 2144 Pre-production Management

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Animation and Visual Effects - Undergraduate Minor

Must be admitted to DFM

Take 18 credits of FDMA/ENGL, FDMA/THEA courses as listed in the Animation and Visual Effects major. A minimum of 9 credits must be upper division.

Digital Film Making - Undergraduate Minor

Must be admitted to ANVE

Take 18 credits from the FDMA/ENGL, FDMA/THTR courses as listed in the Digital Film Making major. A minimum of 9 credits must be upper division.

Criminal Justice Undergraduate Program Information

The Department of Criminal Justice offers courses in the traditional setting as well as online.

The criminal justice degree plan is broadly interdisciplinary in nature embracing the study of the humanities, law, natural, behavioral and social sciences. The curriculum seeks to balance theoretical inquiry with applied knowledge.

Students become prepared for careers in law enforcement, corrections, probation and parole, work with juveniles, victim services, non- and not-for profit organizations connected with criminal and social justice, and the related field of forensics. Graduates have also been successful in law school and graduate programs in the social sciences. The undergraduate major consists of at least 33 credits in the major field, 27 of which must be numbered 300 or above (excluding CJUS 393 Internship in Criminal Justice).

The department offers an interdisciplinary minor in Forensic Sciences. Students interested in the minor should consult with the department head.

Graduate Program Information

The Department of Criminal Justice offers graduate study leading to the Master of Criminal Justice (MCJ) degree. Admission to the MCJ is competitive and prospective graduate students are expected to have at least a 3.0 undergraduate grade-point-average, coursework in research methods and statistics, and possess a bachelor's degree. Those not meeting these requirements may be admitted conditionally and required to make up deficiencies at the outset of their program of study. Applicants should review our graduate handbook (<https://crimjust.nmsu.edu/graduate-programs/HANDBOOK-Revised-May-2019f.pdf>) and provide a personal statement that includes a discussion of your interest in the field and reasons for wanting to pursue the degree (1-2 pages). If interested in a graduate assistantship, please complete the application form (https://crimjust.nmsu.edu/_assets/TA-Application-for-MCJ-in-CJ-.pdf) and provide three letters of recommendation. Students meeting the minimum GPA requirement (3.0 or better) do not need to submit letters of recommendation. Students not meeting the minimum GPA requirement may be asked for additional materials, including letters of recommendation. The GRE is NOT required for admission into the MCJ program. The MCJ Graduate Committee may require a student to complete additional English writing coursework. For more information, please visit the Criminal Justice Graduate Programs webpage (<https://crimjust.nmsu.edu/graduate-programs/criminal-justice-grad.html>).

Students must declare their intent to pursue one of the two degree options: the thesis option or the focused coursework option. The degree options are provided so that students may better match their education

with career goals. The thesis option is often used by students interested in pursuing careers in basic and applied criminal justice research or a doctoral degree. The focused coursework option is often used by students pursuing administrative positions within criminal justice agencies. The thesis option is typically only available for Campus-Based students.

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please contact the director of the MCJ program or consult the Department of Criminal Justice Graduate Programs webpage (<https://crimjust.nmsu.edu/graduate-programs/criminal-justice-grad.html>).

Thesis students must submit a thesis proposal to their faculty committee at a proposal hearing for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination includes a defense of the completed thesis, but may also include a general examination based upon the candidate's program of study. The minimum coursework requirements are displayed below.

Focused coursework students must pass two written comprehensive examinations following completion of the required courses, no earlier than their third semester. Students not passing the examinations will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

Online M.C.J. Coursework

There is an online option for the MCJ degree. Online criminal justice courses are available only to those admitted to the MCJ program as online students, or with permission of the Director of the MCJ program. Students desiring to be admitted to the MCJ program as online students must declare that intent in writing to the MCJ director. For more information regarding the online MCJ degree option, consult the Department of Criminal Justice web page, <http://crimjust.nmsu.edu>, or contact the Director of the MCJ program.

Teaching Assistantships

Teaching assistantships are typically available for some traditional (on-campus) MCJ students on a competitive basis. The Director of the MCJ Program will contact admitted students to determine their interest, and the Graduate Committee will make recommendations to the Department Head for a final decision.

Degrees for the Department Bachelor Degree(s) & Supplemental Major(s)

- Criminal Justice - Bachelor of Criminal Justice (p. 608)
- Criminal Justice - Bachelor of Criminal Justice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/criminal-justice-bcj-online/>)
- Law and Society - Undergraduate Supplemental Major (p. 611)

Master Degree(s) & Dual Degree(s)

- Criminal Justice - Master of Criminal Justice (p. 125)
- Criminal Justice - Master of Criminal Justice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/criminal-justice-mcj-online/>)
- MPA-MCJ Program - Dual Degree (p. 157)

Minors for the Department

- Forensic Science - Undergraduate Minor (p. 610)

Professor, Dennis M. Giever, Department Head

Professor Posadas; **Associate Professors** Keys, Natividad; **Assistant Professors** Baek, Cho, Trujillo; **College Associate Professor** Dimitrijevic; **College Assistant Professor**; D'Antonio-Hangen; **Emeritus Professors** Crowley, Gregware, Mays (Regents), Winfree.

H. Baek, Ph.D. (University of Louisville, Kentucky)–police administration, criminology; A. Cho, Ph.D. (Sam Houston State University)–corrections, gender as it relates to crime & justice; D. Giever, Ph.D. (Indiana University of Pennsylvania)–criminology, research methods, evidence-based program evaluation; D. Keys, Ph.D. (Missouri-Columbia)– penology, narcotic policy; N. Natividad, Ph.D. (Arizona State)–borderland studies, race and identity studies, immigration; C. E. Posadas, Ph.D. (Arizona State)– immigration and justice, juvenile justice, research methods; S. Trujillo, Ph.D. (University of Missouri - St. Louis)–immigration, ethnicity, community-level correlates of crime, as well as juvenile justice and gang behavior; M. Edwards, Ph.D. (Kansas State University) - criminology, community supervision, structural & social inequalities; J. Corey, Ph.D. (University of Texas at Dallas) - corrections, mental health, program evaluation; M. Dimitrijevic, M.A. (New Mexico State University) - human trafficking, drugs, comparative CJ systems; I. D'Antonio-Hangen, M.A. (New Mexico State University) - criminal investigations, human trafficking, forensic law.*

**MCJ Program Director*

Criminal Justice Courses

CJUS 1110G. Introduction to Criminal Justice

3 Credits (3)

This course provides an overall exploration of the historical development and structure of the United States criminal justice system, with emphasis on how the varied components of the justice system intertwine to protect and preserve individual rights. The course covers critical analysis of criminal justice processes and the ethical, legal, and political factors affecting the exercise of discretion by criminal justice professionals.

Learning Outcomes

1. Describe the history, structure and function of the criminal justice system in the United States.
2. Discuss the role of law enforcement, court systems, corrections, and security in maintaining social order.
3. Identify and describe crime causation theories, various measures of crime and their reliability and victimization theories.
4. Relate fundamental principles, concepts and terminology used in criminal justice to current events.
5. Apply basic analytical and critical thinking skills in evaluating criminal justice issues, policies, trends and disparities.

CJUS 1120. Criminal Law

3 Credits (3)

This course covers basic principles of substantive criminal law including elements of crimes against persons, property, public order, public morality, defenses to crimes, and parties to crime. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the concepts of substantive criminal liability in the United States, including actus reus, mens rea, causation, concurrence, and parties to crime.
2. Define the differences between criminal law and civil law in the United States.
3. Demonstrate basic knowledge of legal terminology as it relates to criminal law.
4. Identify the elements of crimes against persons, property, public order and the administration of justice, public morality, and the inchoate crimes.
5. Describe the various defenses to crimes.

CJUS 1996. Special Topics in Criminal Justice

1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated under different topics for a maximum of 6 credits.

Learning Outcomes

1. Varies

CJUS 2120. Criminal Courts and Procedure

3 Credits (3)

This course covers the structures and functions of American trial and appellate courts, including the roles of attorneys, judges, and other court personnel, the formal and informal process of applying constitutional law, rules of evidence, case law and an understanding of the logic used by the courts.

Learning Outcomes

1. Explain the application of the Constitutional Amendments that apply to criminal justice.
2. Explain and describe the dual court system in the U.S. and how courts enforce the rule of law.
3. Identify and list the duties and requirements of the courtroom workgroup.
4. Describe courtroom procedures, rules of the court, and due process of law.
5. Articulate basic knowledge of the U.S. criminal court system.
6. Define legal terms.
7. Explain the use of discretion in criminal procedure.
8. Differentiate the role of courts of limited jurisdiction, courts of general jurisdiction, and the appellate courts in the processing of criminal cases.

CJUS 2140. Criminal Investigations**3 Credits (3)**

This course introduces criminal investigations with in the various local, state, and federal law enforcement agencies. Emphasis is given to the theory, techniques, aids, technology, collection, and preservation procedures which insure the evidentiary integrity. Courtroom evidentiary procedures and techniques will be introduced. Community Colleges only. (Note: students completing CJUS 2140 may not take CJUS 321.)

Learning Outcomes

1. Identify developments in investigation technology.
2. Identify common types of criminal investigations and their key components.
3. Apply proper crime scene investigative protocols.
4. Explain proper evidentiary gathering and handing procedures, and utilize various interviewing techniques.
5. Identify and compare different law enforcement agencies and the role they play in criminal investigations.
6. Describe proper collection, evidence preservation, documentation, and court presentation.
7. Develop effective search authorization.

CJUS 2150. Corrections System**3 Credits (3)**

This course introduces the corrections system in the United States, including the processing of an offender in the system and the responsibilities and duties of correctional professionals. The course covers the historical development, theory, and practice, as well as the institutional and community-based alternatives available in the corrections process.

Learning Outcomes

1. Describe the purposes of the corrections system and the issues facing the corrections system.
2. Explain the components of the corrections system and describe their functions.
3. Compare and contrast the different forms of correction practices.
4. Explain the goals of corrections, the different factors affecting the sentencing process, the legal rights of prisoners, and the issues concerning prison violence.
5. Explain the impact of reentry into society.
6. Identify the issues concerning capital punishment.
7. Describe the effectiveness of various correction programs on offenders.

CJUS 2160. Field Experience in Criminal Justice**3-6 Credits**

This course is designed to provide actual experience working for a criminal justice agency and the opportunity to apply criminal justice concepts and theory to a field situation. Students already working in an agency will complete an approved learning project while on the job.

Prerequisites: CJUS 1110G, prior arrangement and consent of instructor and a GPA of 2.0 or better in major.

Learning Outcomes

1. Obtain practical experience by observing, researching, and working in a criminal justice agency.
2. Apply the knowledge of principles, theories, and methods that were learned in the classroom to situation in which field experience will be devoted
3. Instill an understanding for general and specific problems that criminal justice agencies encounter on a daily basis.
4. Develop a professional work ethic and attitudes, including reliability, professional responsibility, and the ability to work cooperatively with others.

CJUS 2220. The American Law Enforcement System**3 Credits (3)**

This course covers the historical and philosophical foundations of law and order, with an in-depth examination of the various local, state, and federal law enforcement agencies and how they interact within the criminal justice system.

Learning Outcomes

1. Discuss, evaluate, and analyze the role of police in the democratic society today, and the historical development of modern day law enforcement
2. Define and explain the different types of community policing and the valid reasons behind their application within a community
3. List and discuss the ways to overcome the barriers to change within a police organization, good recruitment, screening, and retention of employees
4. Analyze and discuss the history of and the different types of police patrol, as well as the use of force and deadly force, and methods used for controlling police behavior
5. Describe and discuss the different types of police behavior, potential oversight, and remedy and their limitations
6. List and discuss the benefits of higher and continued education, along with the minimum educational requirements for police officers
7. Evaluate and discuss the reasons for police stress and the methods of dealing with stressors
8. Interpret current court cases, both state and federal, that affect police procedures

CJUS 300. Introduction to Criminal Justice Research**3 Credits (3)**

Overview and evaluation of criminal justice research. Selection of research topics, methods of data selection and collection, analysis techniques, and presentation of findings.

Prerequisite: restricted to majors or consent of instructor.

CJUS 301. Advanced Research Methods**3 Credits (3)**

Study of selected quantitative and qualitative skills and their application to criminal justice research.

Prerequisite: Restricted to majors or consent of instructor.

CJUS 302. Crime, Justice and Society**3 Credits (3)**

Through critical analysis students build a rich understanding of the role of crime in our contemporary landscape and explore ideas and practices associated with justice, victimization, criminality, morality and righteousness. The course cultivates knowledge & awareness of the interactions between socially constructed phenomena (race, class, power, ethnicity, economic structures) and popular beliefs, policies, and practices associated with crime, punishment, and formal social control. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G & ENGL 2130G. Restricted to: Criminal Justice majors.

CJUS 303. Introduction to Criminological Theory**3 Credits (3)**

Defining and measuring crime, crime causation, and the criminal behavior system, and their linkage to criminal justice policies, procedures, and practices. Students must be enrolled or have completed third English writing class and completed two of the following: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: C J majors.

Prerequisite(s): CJUS 300.

CJUS 304. Historical Perspectives of Criminal Justice Systems**3 Credits (3)**

Examines the precursors to and development of three distinct systems associated with crime and punishment in the United States: the Courts, the Police, & Corrections. By studying the historical context and socio-political backdrop in which these institutions emerged and expanded students will come to a richer understanding of them and their attendant policies, practices, conventions, and assumptions. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: Criminal Justice majors.

Prerequisite(s): CJUS 300.

CJUS 306. Criminal Procedural Law**3 Credits (3)**

Legal analyses of the rights of criminal defendants; legal duties and responsibilities of criminal justice personnel in the processing of criminal defendants. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 307. Law of Evidence**3 Credits (3)**

Evidentiary rules and concepts and their application in a criminal trial. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 321. Criminal Investigation and Intelligence**3 Credits (3)**

Principles of criminal investigation and intelligence production; processing cases from complaint through crime scene search, identification and collection of evidence, interviewing and interrogation, and case preparation for courts. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 331. American Correctional Institutions**3 Credits (3)**

Structure, organization, and operations of United States jails and prisons. Overview of correctional standards and classification systems, emphasizing current theory and practice.

Prerequisite: restricted to majors or consent of instructor.

CJUS 332. Correctional Law**3 Credits (3)**

Federal and state laws and rules of post-conviction procedures; rights of the convicted related to sentencing, appeals, clemency, and restoration of rights.

Prerequisite: restricted to majors or consent of instructor.

CJUS 333. Juvenile Corrections**3 Credits (3)**

Development and implementation of juvenile facilities and community programs. Effectiveness of current corrections practices. Restricted to majors.

CJUS 345. Victimology**3 Credits (3)**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system.

Prerequisite: restricted to majors or consent of instructor.

CJUS 346. Psychology and the Justice System**3 Credits (3)**

Analysis of psychological underpinnings of criminal behavior and the implications of these psychological principles for criminal justice policy. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 347. Sex Crimes**3 Credits (3)**

Dynamics of sex crimes for victims and offenders, plus consideration of the legal and correction systems' response to sex crimes. Restricted to majors.

CJUS 348. Serial Killers**3 Credits (3)**

Overview and critical assessment of serial homicide and its relevance for contemporary U.S. society. Focus on factors influencing definitions and cultural understanding of serial homicide.

Prerequisite(s): 60 credit hours.

CJUS 360. The Juvenile Justice System**3 Credits (3)**

History, development, and philosophy behind a separate juvenile justice system. Role of the juvenile court, evaluation of juvenile law and procedure, and the processing of juvenile offenders.

Prerequisite: restricted to majors or consent of instructor.

CJUS 380. Introduction to Terrorism**3 Credits (3)**

Overview of the phenomenon of terrorism, psychological and sociological theories of terrorism, and various contemporary governmental policies.

CJUS 391. Special Readings in Criminal Justice**1-3 Credits**

Individually chosen subject areas not readily available in other courses. May be repeated for a maximum of 6 credits under different subtitles. Restricted to majors.

Prerequisites: at least a 2.5 GPA and consent of instructor.

CJUS 393. Internship in Criminal Justice**1-12 Credits**

Field experience in a local, state, or federal criminal justice or private security agency. Includes orientation, observation, conferences, and work experience. Credits limited to six if student has taken CJUS 2160. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.

Prerequisites: consent of instructor and GPA of 2.5 or better.

CJUS 399. New Mexico Law**3 Credits (3)**

Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico. Crosslisted with: POLS 399. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analyze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

CJUS 405. Juvenile Courts and Law**3 Credits (3)**

History, development, and current status of juvenile courts. Legal status of juveniles in court and constitutional protections afforded them. Restricted to majors.

CJUS 410. Criminal Justice Administrative Systems**3 Credits (3)**

Administrative structures in criminal justice agencies and institutions; relationship of administrative structures to practical police, courts, and corrections problems.

Prerequisite: restricted to majors or consent of instructor.

CJUS 412. Introduction to Security Technology and Loss Prevention**3 Credits (3)**

Private and public responses to security problems, including employee theft, perimeter security, and domestic or foreign terrorism; reviews related law and management practices.

CJUS 414. Race, Crime and Justice**3 Credits (3)**

Historical and contemporary analysis of the relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 416. Global Perspectives on Youth and Drug Use**3 Credits (3)**

Overview of global drug use among young people, comparative legal structures, formal and informal responses. Restricted to C J, ANTH, GOVT, SOC, GNDR, S WK majors.

CJUS 417. Drugs In Our World**3 Credits (3)**

Comparative analysis of patterns and theories of drug use, formal government mitigation strategies.

CJUS 424. Forensic Law**3 Credits (3)**

Overview of the rules and issues related to the use of scientific information in the legal process. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): C J major, Forensic Science minors, or consent of instructor.

CJUS 425. Issues in Ethics, Law, and Criminal Justice**3 Credits (3)**

Examination of the key ethical and decision-making dilemmas facing professionals working in the field of law and criminal justice.

Prerequisite: restricted to majors or consent of instructor.

CJUS 427. Race and Crime in Film**3 Credits (3)**

Critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

Prerequisite(s): 60 credit hours.

CJUS 428. Mexican-Americans and Issues of Social Justice**3 Credits (3)**

In this course we will explore and discuss social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."

Prerequisite(s): Students must have completed CJUS 300 or research methods equivalent or consent from the instructor.

CJUS 429. Immigration & Justice**3 Credits (3)**

This course is designed to introduce undergraduate students to the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

Prerequisite(s): Student must have completed CJUS 300 or Research Methods equivalent or consent of the instructor.

CJUS 430. The U.S. Supreme Court and the Criminal Justice System**3 Credits (3)**

History and workings of the U.S. Supreme Court in the context of the criminal justice system from writs of certiorari to last minute appeals in death penalty cases, including study of specific U.S. Supreme Court cases in the areas of criminal law, criminal procedural law, 8th amendment prison sentencing issues, and death penalty cases. Consent of Instructor required. Restricted to: Criminal Justice majors.

CJUS 431. Family Violence and the Law**3 Credits (3)**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

CJUS 432. Issues in Criminal Justice**3 Credits (3)**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated for unlimited credits under different subtitles.

CJUS 434. Probation, Parole, and Community Corrections**3 Credits (3)**

Structure, organization, and operation of probation, parole, and other community-based correctional programs in the U.S. Overview of historical and recent trends in the supervision of offenders in the community and in the development of alternatives to incarceration. Analysis of issues related to community correctional policies and practices. Restricted to majors.

CJUS 435. Political Penology**3 Credits (3)**

Comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

CJUS 436. Courts and Sentencing**3 Credits (3)**

This course will focus on the structure, organization, and operation of the state and federal court systems in the United States. It examines courtroom decision making and dynamics of courthouse justice—prosecutorial discretion, plea bargaining practices, jury and judicial decision making and sentencing. Additional topics will include racial, gender and class disparities in sentencing outcomes and the impact of recent reforms directed at the criminal court system. Restricted to: Criminal Justice majors.

CJUS 437. Wrongful Convictions**3 Credits (3)**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 440V. Comparative Criminal Justice Systems**3 Credits (3)**

Cross-national study of selected Western and non-Western legal systems. Comparison of structures and functions of police, court systems, and corrections in different systems.

CJUS 449. Senior Seminar**3 Credits (3)**

Problems and conflicts encountered in major attempts to control crime. Restricted to majors.

Prerequisite(s): CJUS 1110G, CJUS 1120, CJUS 2220, CJUS 2150, CJUS 2120, CJUS 300, CJUS 301, 90 credit hours completed.

CJUS 453. Women and Justice**3 Credits (3)**

Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors.

CJUS 454. Human Trafficking**3 Credits (3)**

Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, GNDR, S WK majors.

CJUS 455. Feminist Research Methods**3 Credits (3)**

Feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as GNDR 455.

CJUS 456. Police and the Community**3 Credits (3)**

This course is an advanced introduction to policing in the United States. The course will also cover current issues in policing, such as new technologies and the role of police in terrorism prevention.

Learning Outcomes

1. Describe the evolution of police community relations and community policing.
2. Compare and contrast traditional policing with community policing.
3. Examine discretion in police work and relate it to legal, operational, and ethical issues and problems.
4. Examine police misconduct and corruption.
5. Examine the importance of professionalism and ethics in police work.
6. Identify strategies for interacting with the physically and mentally disabled, the elderly, and crime victims.

CJUS 484. Hate Crimes & Groups**3 Credits (3)**

Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups, and social theories attempting to explain violent hate.

CJUS 501. Research Methods in Criminal Justice**3 Credits (3)**

Research design, methods of data collection and analysis, and preparation of research reports. Restricted to majors.

Prerequisite: C J major or consent of instructor.

CJUS 502. Statistics in Criminal Justice**3 Credits (3)**

Intermediate level statistical techniques applied to criminal justice data.

Learning Outcomes

1. Understand the basic statistical procedures for criminal justice research.
2. Use statistical software to enter and edit data, and conduct basic analysis.
3. Allow students the opportunity to recognize the critical role of empirical research in informing, influencing, and evaluating criminal justice practices and policies.
4. Developing a basic understanding of the role of statistics in criminal justice research.
5. Interpret and evaluate research evidence and statistical operations.

CJUS 511. Nature of Crime**3 Credits (3)**

Defining and measuring crime, crime causation, and criminal behavior systems. Restricted to majors.

Prerequisite: C J major or consent of instructor.

CJUS 514. Advanced Race, Crime, and Justice**3 Credits (3)**

Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 515. A Course on Punishment**3 Credits (3)**

Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system.

CJUS 520. Advanced Girls, Women & Crime**3 Credits (3)**

Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, GNDR majors. Crosslisted with: GNDR 520

CJUS 525. Issues in Ethics, Law, and Criminal Justice**3 Credits (3)**

Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors.

CJUS 527. Advanced Race & Crime in Film**3 Credits (3)**

Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

CJUS 528. Advanced Mexican-Americans and Issues of Social Justice**3 Credits (3)**

Advanced analysis of social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."

Learning Outcomes

1. Explore and discuss social issues related to the Mexican American community in the U.S.
2. Gain a better understanding of the history of the Mexican American experience in the U.S.
3. Understand current social justice issues impacting the Mexican American community.
4. Explore the Mexican American community experience particularly in the southwest.
5. Critically engage the challenges faced by the Mexican American community on issues such racial discrimination, racial profiling, immigration, and crime.

CJUS 529. Advanced Immigration & Justice**3 Credits (3)**

Advanced analysis of the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

CJUS 531. Advanced Family Violence and the Law**3 Credits (3)**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

CJUS 532. Advanced Issues in Criminal Justice (f, s, sum)**3 Credits (3)**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit.

CJUS 535. Advanced Political Penology**3 Credits (3)**

Advanced comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

CJUS 537. Advanced Wrongful Convictions**3 Credits (3)**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 541. Seminar in Criminal Justice Policy Analysis and Planning**3 Credits (3)**

Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and outcomes. Topics announced in the Schedule of Classes. Restricted to majors.

Prerequisite: C J major or consent of instructor.

CJUS 545. Advanced Victimology**3 Credits (3)**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes.

CJUS 555. Advanced Feminist Research Methods**3 Credits (3)**

Advanced feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as GNDR 555.

CJUS 560. Juvenile Justice Systems**3 Credits**

Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. CJUS 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.

CJUS 581. Community Policing**3 Credits (3)**

Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.

CJUS 591. Directed Readings in Criminal Justice**3 Credits (3)**

Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.

CJUS 592. Independent Research**1-3 Credits**

Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.

CJUS 593. Internship**3-6 Credits**

Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisites: introductory graduate course in the area of the internship and consent of the internship supervisor.

CJUS 599. Master's Thesis**1-15 Credits**

Thesis.

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Criminal Justice - Bachelor of Criminal Justice

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following: ¹		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
Choose one from the following: ²		3
MATH 1220G	College Algebra ³	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
<i>Area III: Laboratory Sciences Course (4 credits) ³</i>		
<i>Area IV: Social Behavioral Sciences Course</i>		
CJUS 1110G	Introduction to Criminal Justice	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ³		
<i>Area V: Humanities</i>		

Choose one from the following: ⁴		3
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 2110G	Introduction to Ethics	
<i>Area VI: Creative and Fine Arts ³</i>		3
<i>General Education Elective ³</i>		3-4
Viewing a Wider World ⁵		6
Departmental/College Requirements		
<i>CJUS Core Courses ⁶</i>		
The department requires CJUS 1110G and this course will count towards both the General Education and Departmental/College Requirements		
CJUS 1120	Criminal Law	3
CJUS 301	Advanced Research Methods	3
CJUS 302	Crime, Justice and Society	3
CJUS 425	Issues in Ethics, Law, and Criminal Justice	3
Select 3-4 credits from the following:		3-4
CJUS 300	Introduction to Criminal Justice Research	
POLS 300	Political Research Skills	
PSYC 310	Experimental Methods	
SOCI 3150	Social Research: Methods	
<i>CJUS Theory Courses</i>		
One course from the following:		3
CJUS 303	Introduction to Criminological Theory	
CJUS 304	Historical Perspectives of Criminal Justice Systems	
CJUS 414	Race, Crime and Justice	
<i>Criminal Justice Electives</i>		
Select 12 credits from upper division Criminal Justice Electives ⁷		12
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one additional English Composition - Level 2 course, must be a different course that previously selected:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Second Language Requirement: (required- see below)		3-14
Electives, to bring the total credits to 120 ⁸		32-46
15 credits must be Upper Division ⁹		
Total Credits		120

- ¹ The department requires 6 credits of English Composition - Level 2 coursework, 3 credits will count towards the General Education requirement, the other 3 credits will count as Non-Departmental requirements. ENGL 112 will only be accepted to fulfill one of the English Composition Level 2 requirements and is only allowed for transfer students.
- ² MATH 1220G, MATH 1350G or MATH 2350G are preferred but any Mathematics course that is higher level than MATH 121G, excluding MATH 1130G Survey of Mathematics, or higher than STAT 251G is also accepted.
**students may need to take any prerequisites needed to enter of the allowable Mathematics course(s) first.*
- ³ See the General Education (p. 220) section of the catalog for a full list of courses.
- ⁴ Students can take an Upper-Division PHIL course to meet departmental requirements, however, if this option is chosen, the student will have to take another general education humanities course to fulfill the general education humanities requirement.

- ⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁶ Prior to enrolling in upper division courses, lower division courses must be completed or final courses must be in progress.
- ⁷ Not to include CJUS 393 Internship in Criminal Justice, or any criminal justice required course. Courses that fall under multiple content areas may only be counted once. Please visit our website for specific courses in each of these content areas <http://crimjust.nmsu.edu>.
- ⁸ Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁹ For transfer students only.

*A student must earn a C- or better to receive credit for any departmental and nondepartmental requirement for the BC J degrees.

Second Language Requirement

For the Bachelor of Criminal Justice with a major in Criminal Justice there is a two year second language requirement (or the completion of MATH 1511G), the student must do one of the following: there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
CHIN 2120	Mandarin Chinese IV	3
or FREN 2120	French IV	
or GRMN 2120	German IV	
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	

OR

Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G, or MATH 1350G or MATH 2350G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
Choose one from the following: ¹		3
MATH 1220G	College Algebra (C- or better)	
MATH 1350G	Introduction to Statistics (C- or better)	
MATH 2350G	Statistical Methods (C- or better)	

CJUS 1110G	Introduction to Criminal Justice (C- or better and counts towards Area IV Requirement)	3
Choose one Area V: Humanities and Fine Arts Course from the following: ²		3
PHIL 1145G	Philosophy, Law, and Ethics (C- or better)	
PHIL 2230G	Philosophical Thought (C- or better)	
PHIL 1120G	Logic, Reasoning, & Critical Thinking (C- or better)	
PHIL 2110G	Introduction to Ethics (C- or better)	
FYEX 1112 or Elective		3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course ³		4
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course ³		3-4
CJUS 1120	Criminal Law (C- or better)	3
Elective Course		1
Credits		30-31
Sophomore		
Choose one from the following: (C- or better)		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
General Education Elective Course ³		3-4
Area V: Creative and Fine Arts Course ²		3
Second Language Requirement: 1110- level (C- or better) ⁴		4
Second Language Requirement: 1120- level (C- or better) ⁴		4
CJUS 300	Introduction to Criminal Justice Research (C- or better)	3
Elective Courses ⁵		10
Credits		30-31
Junior		
Second Language Requirement: 2110- level (C- or better) ⁴		3
Second Language Requirement: 2120- level (C- or better) ⁴		3
VWW - Viewing a Wider World Courses ⁹		6
CJUS 301	Advanced Research Methods (C- or better) ⁷	3
CJUS - Upper Division Elective Course (C- or better)		3
CJUS 302	Crime, Justice and Society (C- or better)	3
CJUS 425	Issues in Ethics, Law, and Criminal Justice (C- or better)	3
Elective Course - Upper Division ⁵		3
Elective Courses ⁵		3
Credits		30
Senior		
Choose one from the following:		3
CJUS 303	Introduction to Criminological Theory (C- or better)	
CJUS 304	Historical Perspectives of Criminal Justice Systems (C- or better)	
CJUS 414	Race, Crime and Justice (C- or better)	
CJUS - Upper Division Elective Course (C- or better)		9
Elective Course - Upper Division ⁵		12

Elective Course ⁵	6
Credits	30
Total Credits	120-122

- ¹ Math Placement: MATH 1220G College Algebra or MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into one of these courses.
- ² See the General Education (p. 220) section of the catalog for a full list of courses.
- ³ One of the following is required for the major: PHIL 1145G Philosophy, Law, and Ethics, PHIL 2230G Philosophical Thought, PHIL 1120G Logic, Reasoning, & Critical Thinking, and PHIL 2110G Introduction to Ethics
- ⁴ Second Language: options for completing the second language requirement can be located on the Requirements (p. 608) tab for this degree.
- ⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁶ CJUS 300 Introduction to Criminal Justice Research can be taken in either the Fall or Spring semesters of Year Two. The following courses may substitute for CJUS 300: POLS 300 Political Research Skills, PSYC 310 Experimental Methods, SOCI 3150 Social Research: Methods
- ⁷ CJUS 300 Introduction to Criminal Justice Research and CJUS 301 Advanced Research Methods should ideally be taken in separate semesters
- ⁸ Recommended: 1 credit of PHED, LSAT Prep or FYEX coursework
- ⁹ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Forensic Science - Undergraduate Minor

Forensic Science is the application of principles and techniques of scientific analysis in a legal context. Forensic scientists study physical evidence to resolve issues involving criminal investigations, environment analyses and similar areas of research.

A student must pass 18 credits with a grade of C- or higher from the following curriculum to earn the Forensic Science minor. No courses may be taken S/U. Students must take at least 6 credits from departments outside their major(s). At least 9 credits in any minor must be upper division. Students must register in the minor before enrolling in any upper division Criminal Justice courses.

The following curriculum represents minimum requirements for a minor. Students interested in a career in Forensic Science are encouraged to take additional courses from those listed below.

The Forensic Minor requires courses from three sections: (1) 6 credits from the list of Core Courses; (2) 3 credits from an additional course not already completed; and (3) 9 credits from one of the four tracks listed below.

Prefix	Title	Credits
Core Courses		
Select 6 credits from the following:		6
CJUS 306	Criminal Procedural Law	
CJUS 307	Law of Evidence	
CJUS 321	Criminal Investigation and Intelligence	
CJUS 424	Forensic Law	
PHYS 304	Forensic Physics	
Additional Course		
Select 3 credits from areas I or II above not already completed.		3
Track Courses		
9 credits from one of the four tracks (see below)		9
Total Credits		18

Track A: Laboratory Analysis

Students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Prefix	Title	Credits
Select one from the following:		4-5
BIOL 2310 & 2310L	Microbiology and Microbiology Lab	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	
Select 4-5 credits from the following:		4-5
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BCHE 395	Biochemistry I	
BCHE 396	Biochemistry II, Lecture and Laboratory	
CHEM 371	Analytical Chemistry	
TOX 361	Basic Toxicology	
TOX 461	Toxicology I	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
Total Credits		8-10

Track B: Human Forensic Analysis

Honors, Special Topics, or Independent Studies courses if approved by Academic Head, Department of Criminal Justice.

Prefix	Title	Credits
Select 9 credits from the following: ¹		9
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ANTH 315	Introduction to Archaeology	
ANTH 355	Biological Anthropology	
ANTH 356	Forensic Anthropology	
ANTH 357V	Medical Anthropology	
ANTH 388	Intermediate Archaeological Field School	
ANTH 474	Human Osteology ²	
ANTH 477	Zooarchaeology	
Total Credits		9

¹ Recommended sequence ANTH 1135G Introduction to Biological Anthropology/ANTH 1135L Introduction to Biological Anthropology Lab, ANTH 355 Biological Anthropology or ANTH 315 Introduction to Archaeology, and then ANTH 474 Human Osteology.

² Courses have prerequisites, and students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Track C: Forensic Psychology

Students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Prefix	Title	Credits
Required Courses		
Select three from the following:		9
<i>Principles of Behavior</i>		
PSYC 317	Social Psychology	
PSYC 321	Psychology of Personality	
PSYC 324	Sexual Behavior	
PSYC 330	Psychology and the Law	
PSYC 376	Evolutionary Psychology	
<i>Psychological Treatment</i>		
PSYC 302	Abnormal Psychology	
CJUS 346	Psychology and the Justice System	
Total Credits		9

Track D: General

Prefix	Title	Credits
Select 9 credits from the following:		9
ANTH 474	Human Osteology ¹	
CJUS 306	Criminal Procedural Law	
CJUS 307	Law of Evidence	
CJUS 321	Criminal Investigation and Intelligence	
CJUS 346	Psychology and the Justice System	
CJUS 424	Forensic Law	
PSYC 330	Psychology and the Law	
PHYS 304	Forensic Physics	
Total Credits		9

¹ Courses have prerequisites, and students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Law and Society - Undergraduate Supplemental Major

The Law and Society Program (p. 682) is administered by the Department of Government and offers an interdisciplinary major for students interested in pursuing law school or careers that incorporate a strong legal element, such as government, law enforcement, business and social work. As a supplementary major, it must be taken in conjunction with a regular major. Some courses may double-count toward a student's regular major or General Education requirements. Students should check with academic advisors in their primary major. To declare this supplemental major please contact the College of Arts & Sciences Student Records Office. For more information please visit: <https://deptofgov.nmsu.edu/academic-programs/law-society.html>.

Economics, Applied Statistics, and International Business

Undergraduate Program Information

The Department of Economics, Applied Statistics and International Business in the College of Business offers an economics major to Bachelor of Arts candidates in the College of Arts and Sciences. (Additional information may be found under the Economics and International Business (p. 858) section in the College of Business chapter).

Degrees for the Department

- Economics - Bachelor of Arts (p. 615)

Minors for the Department

- Economics - Undergraduate Minor (p. 617)

Economics Courses

ECON 1110G. Survey of Economics

3 Credits (3)

This course will develop students' economics literacy and teaches students how economics relates to the everyday life of individuals, businesses and society in general. The course will also introduce students to the roles different levels of governments play in influencing the economy. At the conclusion of the course, students will be able to identify economic causes for various political and social problems at national and international levels, and have a better understanding of everyday economic issues that are reported in media and public forums.

Learning Outcomes

1. Gain and demonstrate a contextual understanding of economic terms and concepts.
2. Recognize and analyze common economic issues which relate to individual markets and the aggregate economy.
3. Learn basic economic principles that influence global trading and challenges relating to globalization.
4. Outline the implications of various economic policies on individuals and on economies.
5. Demonstrate ability to use diagrams and graphs to explain economic principles, policies and their applications.
6. Appreciate and understand how individual decisions and actions, as a member of society, affect economies locally, nationally and internationally.
7. Explain the roles of governments in influencing buyer and seller behavior in the market and how government failure occurs when intervention fails to improve or actually worsens economic outcomes.
8. Be able to apply course concepts to interpret, evaluate and think critically about economic events and policies, especially as regularly reported in the media and other public forums.

ECON 2110G. Macroeconomic Principles

3 Credits (3)

Macroeconomics is the study of national and global economies. Topics include output, unemployment and inflation; and how they are affected by financial systems, fiscal and monetary policies.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2110H. Principles of Macroeconomics Honors

3 Credits (3)

Macroeconomic theory and public policy designed: national income concepts, unemployment, inflation, economic growth and international payment problems. Must be a Crimson Scholar.

Prerequisite(s): MATH 1220G.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2120G. Microeconomics Principles**3 Credits (3)**

This course will provide a broad overview of microeconomics. Microeconomics is the study of issues specific to households, firms, or industries with an emphasis on the role of markets. Topics discussed will include household and firm behavior, demand and supply, government intervention, market structures, and the efficient allocation of resources.

Learning Outcomes

1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 2120H. Principles of Microeconomics Honors**3 Credits (3)**

Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions. Must be a Crimson Scholar.

Prerequisite(s): MATH 1220G.

Learning Outcomes

1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 304. Money and Banking**3 Credits (3)**

Income measurement and determination, monetary and fiscal policies.

Prerequisite(s): ECON 2110G or ECON 2110H or equivalent.

ECON 311. Intermediate Macroeconomic Theory**3 Credits (3)**

Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.

Prerequisite: ECON 2110G or ECON 2110H.

Learning Outcomes

1. Learn the uses and abuses of macroeconomic data
2. Learn the role of economic theory in understanding economic issues and forecasting economic behavior
3. Learn the causes and consequences of short-run economic fluctuations and long-run economic growth
4. Learn the role of government in the macroeconomy
5. By the end of the class, you should be able to describe the state of the macroeconomy and analyze the consequences of economic policy actions from several perspectives

ECON 312. Intermediate Microeconomic Theory**3 Credits (3)**

Contemporary economic theory with emphasis upon value and distribution.

Prerequisite: ECON 2120G or ECON 2120H or equivalent.

Learning Outcomes

1. Gain an understanding of the language of Intermediate Microeconomics.
2. Know the underlying structure of economic models such as supply and demand, consumer theory, producer theory and market structure.
3. Understand the assumptions of economic models.
4. Be able to solve a supply and demand model.
5. Demonstrate critical thinking skills by applying economic models to a wide variety of policy questions.

ECON 324V. Developing Nations**3 Credits (3)**

Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

ECON 325V. Economic Development of Latin America**3 Credits (3)**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the essential components for economic growth and development
2. Understand how Latin America fell behind other regions in terms of economic development
3. Compare various policies implemented to support economic development in the region, as well as the successes and failures of these policies
4. Gain a basic understanding of how to conduct independent research

ECON 332. Public Finance**3 Credits (3)**

This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 2120G or ECON 2120H

ECON 335V. Business and Government**3 Credits (3)**

Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGMT 335G

ECON 337V. Natural Resource Economics**3 Credits (3)**

Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as AEEC 337V.

Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

ECON 345. Energy Economics**3 Credits (3)**

Examines the economics of energy production including oil, coal, natural gas, renewables, and conservation as a substitute for energy production. Emphasis is on federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.

Prerequisite(s): (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

ECON 384V. Water Resource Economics**3 Credits (3)**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AEEC 384V.

Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

ECON 404. Collegiate Advisory Board, Federal Reserve**3 Credits (3)**

Students serve on the Collegiate Advisory Board of the El Paso branch of the Federal Reserve Bank of Dallas. Guest speakers provide an overview of the Federal Reserve System, role of monetary policy, and issues facing specific industries in the local, national, and global economies. Students prepare reports, including a final paper, on an assigned industry in the regional or state economy and the current economic performance of their industry. Students must be of junior rank or higher with a GPA of at least 3.5. Consent of Instructor required.

ECON 405. Introductory Econometrics**3 Credits (3)**

Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.

Prerequisite: MATH 1350G or A ST 311 (or equivalent).

Learning Outcomes

1. Demonstrate knowledge of probability and statistics and basic expected value theory.
2. Define the relationship between population statistics and sample statistics.
3. Explain the method of ordinary least squares.
4. Understand multiple regression, correlation, inference techniques, and significance tests.
5. Interpret basic econometric results.

ECON 432V. Economics of Health Care**3 Credits (3)**

Analysis of the allocation of resources in the field of health and medical care.

ECON 445. Oil and Natural Gas Economics**3 Credits (3)**

Examines the economics of oil and gas production. Topics covered include transportation, refining, federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.

Prerequisite: (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

Learning Outcomes

1. Oil and Natural Gas Production
2. Oil and Natural Gas Transportation and Storage
3. Advanced oil and gas market analysis
4. Economic analysis of government energy policy and regulation

ECON 449. Open Economy Macroeconomics**3 Credits (3)**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.

Prerequisite(s): BFIN 341 OR ECON 311.

ECON 450. International Economics**3 Credits (3)**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450

Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

ECON 457. Mathematical Economics**3 Credits (3)**

Application of mathematical tools, especially the calculus, to economic theory.

Prerequisite(s): MATH 1430G or equivalent.

ECON 471. Electricity Economics**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric Industry. Topics include characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Crosslisted with: ECON 571.

Prerequisite(s): ECON 345.

ECON 489. Senior Economics Seminar**3 Credits (3)**

Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics.

Prerequisite(s): ECON 311 or ECON 312.

ECON 490. Selected Topics**1-3 Credits**

Current topics in economics. Subject matter to be designated for each semester.

ECON 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.

Prerequisite: junior or above standing and consent of instructor.

ECON 503. Managerial Economics**3 Credits (3)**

Theory and application of microeconomics to the management of organizations.

Prerequisite(s): MATH 1350G or A ST 311 or equivalent with B or better.

ECON 545. Econometrics II**3 Credits (3)**

Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

Prerequisite(s): ECON 457 and AEEC 540.

ECON 550. Special Topics**1-3 Credits**

Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

ECON 571. Regulatory Policy and Industry Analysis: Electricity I**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas**3 Credits (3)**

Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

ECON 573. Regulatory Policy and Industry Analysis: Electricity II**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.

Prerequisite(s): ECON 571 or consent of instructor.

ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis**3 Credits (3)**

Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.

Prerequisite(s): ECON 571 or consent of instructor.

ECON 582. Economics of Health Care**3 Credits (3)**

Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.

ECON 596. Independent Study**3 Credits (3)**

Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

Phone: (575) 646-2113

Website: <http://business.nmsu.edu/academics/economics-ib/>

Economics - Bachelor of Arts

The Bachelor of Arts major in Economics is the only bachelor of arts degree offered through the College of Business. It has the advantage of including a large number of general electives. This feature provides great flexibility to the student who, in addition to completing the courses for a major in economics, may wish to take a double major or take courses from a wide variety of other subjects of his or her own choosing.

This program is suitable for, among others, students who plan to go to graduate school in economics, law, business, the social sciences or other areas.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		

*Area I: Communications**English Composition - Level 1*

Choose one from the following: 4

ENGL 1110G	Composition I
ENGL 1110H	Composition I
ENGL 1110M	Composition I

English Composition - Level 2

Choose one from the following: 3

ENGL 2210G	Professional & Technical Communication
ENGL 2221G	Writing in the Humanities and Social Science

Oral Communication

Choose one from the following: 3

ACOM 1130G	Effective Leadership and Communication in Agriculture
COMM 1115G	Introduction to Communication
COMM 1130G	Public Speaking
HNRS 2175G	Introduction to Communication Honors

Area II: Mathematics

MATH 1220G	College Algebra (Foundation Requirement) ¹	3
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Area III/IV: Laboratory Sciences and Social/Behavioral Sciences 10

ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)

*Area III: Laboratory Sciences Course (4 credits) ²**Area V: Humanities ²* 3*Area V: Creative and Fine Arts ²* 3*General Education Elective*

MATH 1430G	Applications of Calculus I (must earn a grade of at least C-) ¹	3
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Viewing A Wider World Courses ³ 6**Departmental/College Requirements***Foundation Requirements ⁴*

Choose one from the following: 3

If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹

MATH 1350G	Introduction to Statistics
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)

ACCT 2110	Principles of Accounting I	3
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Major Courses ⁵

ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON 457	Mathematical Economics	3

At least two electives must be from the following: 6

ECON 332	Public Finance
ECON 449	Open Economy Macroeconomics
ECON 450	International Economics

Additional ECON Upper Division Electives 6**Second Language: (not required)****Electives, to bring the total credits to 120 ⁶** 49**Total Credits** 120

MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities Course ²		3
Elective course ³		3
Elective Course ³		3
Credits		16

Spring

MATH 1430G	Applications of Calculus I (C- or better) ¹	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative Fine Arts Course ²		3
Elective Course ³		3
Credits		16

Second Year

Fall		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better)	

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or

ECON 2110G	Macroeconomic Principles ((C- or better, counts towards Area IV Gen.Ed))	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication (C- or better)	
ENGL 2221G	Writing in the Humanities and Social Science (C- or better)	
Elective Course ³		3
Credits		15
Spring		
ECON 2120G	Principles of Microeconomics ((C- or better, counts towards Area IV Gen.Ed)) ¹	3
Viewing a Wider World Course ⁴		3
Elective Course ³		4
Elective Course ³		3
Elective Course ³		3
Credits		16
Third Year		
Fall		
ECON 304	Money and Banking ¹	3
ECON 311	Intermediate Macroeconomic Theory ¹	3
Elective Course ³		3
Elective Course ³		3
Elective Course ³		3
Credits		15
Spring		
ECON 312	Intermediate Microeconomic Theory ¹	3
ECON 405	Introductory Econometrics ¹	3
Viewing a Wider World Course ⁴		3
Elective Course ³		3
Elective Course ³		3
Credits		15
Fourth Year		
Fall		
ECON 457	Mathematical Economics	3
Choose one Upper-Division Elective in ECON from the following: ⁵		3
ECON 332	Public Finance ¹	
ECON 449	Open Economy Macroeconomics ¹	
ECON 450	International Economics	
Elective Course ³		3
Elective Course ³		3
Elective Course ³		3
Credits		15
Spring		
Choose one Upper-Division Elective in ECON from the following (it must differ from the Fall semester): ⁵		3
ECON 332	Public Finance ¹	
ECON 449	Open Economy Macroeconomics ¹	
ECON 450	International Economics	
ECON Upper-Division Elective Course ⁵		3
ECON Upper-Division Elective Course ⁵		3
Elective Course ³		3
Credits		12
Total Credits		120

- ¹ Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.
- ² See the General Education (p. 220) section of the catalog for a full list of courses.
- ³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁵ Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.
Fall: ECON 337V Natural Resource Economics, ECON 432V Economics of Health Care, ECON 449 Open Economy Macroeconomics
Fall/Summer: ECON 457 Mathematical Economics
Spring: ECON 384V Water Resource Economics
- ⁶ **International Business Double Majors:** Students may not receive credit for both ECON 489 Senior Economics Seminar and I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Economics - Undergraduate Minor

The undergraduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro-economic forces influence individuals, business and government decision making. Students thinking of a career in banking and finance, government service, or law will find the minor helpful.

A minor in economics consists of 18 or more credit hours of approved course work in economics (ECON), of which at least 12 are numbered 300 or higher, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ECON 2110G	Macroeconomic Principles ¹	3
ECON 2120G	Principles of Microeconomics ¹	3
ECON 304	Money and Banking	3
or ECON 311	Intermediate Macroeconomic Theory	
ECON 312	Intermediate Microeconomic Theory	3
Upper-division courses (300 or higher) in economics		6
Total Credits		18

- ¹ ECON 1110G Survey of Economics may be substituted for one of Econ 251G Principals of Macroeconomics or Econ 252G Principals of Microeconomics with the approval of the Head of the Department of Economics, Applied Statistics, and International Business.

English Undergraduate Program Information

The Department of English offers the Bachelor of Arts (BA) in English as the cornerstone of studies in the humanities. This rich and versatile

major provides students with a source of personal enrichment as well as verbal, analytical and cultural skills that are readily adaptable to a variety of careers. The English curriculum includes courses in literature, language, creative writing, technical and professional communication, rhetoric, cultural studies, digital media, and film. Our majors go on to succeed in a wide range of professions, including secondary and post-secondary education, business, government, publishing, and law. We offer four different major concentrations that students can tailor to their individual needs:

1. English
2. Creative Writing
3. Literature, Language and Culture
4. Rhetoric, Digital Media and Professional Communication

The department provides strong and personalized advising designed to help students reach their full academic potential and future career goals.

The department also offers four minors:

- English
- Literature
- Medieval and Early Modern Studies
- Rhetoric and Professional Communication

Further information about career opportunities, concentrations, and minors is available from the Department of English. Students who wish to pursue English as a double major may eliminate one elective from the departmental requirements. Students are required to fulfill a second language requirement (one year of college-level instruction, or the equivalent).

Graduate Program Information

Graduate coursework in the Department of English spans a diverse field of studies in culture, rhetoric, literature, digital media, composition pedagogy, professional communication, and writing. The department offers two graduate degrees: the Master of Arts in English and the Doctor of Philosophy in Rhetoric and Professional Communication. Students pursuing the MA in English may specialize in any of three areas: Literature; Rhetoric and Professional Communication; or English Studies for Teachers. Through NMSU-O, the department also offers a fully online (asynchronous) MA in Technical and Professional Communication. These graduate degrees prepare students to succeed in a variety of careers, including writing, editing, publishing, secondary and post-secondary education, business and industry, media, web design, government, nonprofits, and law. Students work closely with faculty advisors to develop programs of study that fit their individual needs and goals.

Students wishing to apply to the MA or PhD should consult application information on the English Department website at <http://english.nmsu.edu/apply/> (https://english.nmsu.edu/_assets/apply.html). Applications are due by February 1st for Fall admission to the MA or the PhD program. MA applications are also accepted for Spring admission; review of MA applications for Spring admission begins on October 1.

Support in the form of a Graduate Assistantships is awarded through a competitive selection process; this application is folded into the application for admission and should be submitted by the February 1st deadline. Students in the PhD and in the MA emphases in Literature and Rhetoric and Professional Communication are eligible to apply for a

Graduate Assistantship. All Graduate Assistantships in English begin in the Fall semester.

Degrees for the Department

Bachelor Degree(s)

- English (Creative Writing) - Bachelor of Arts (p. 633)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 637)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 639)
- English - Bachelor of Arts (p. 635)
- Gender and Sexuality Studies - Bachelor of Arts (<http://catalogs.nmsu.edu/nmsu/arts-sciences/english/gender-sexuality-studies-ba/>)
- Gender and Sexuality Studies - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/gender-sexuality-studies-ba-online/>)

Master Degree(s)

- English (Technical and Professional Communication) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/english-technical-professional-communication-ma-online/>)
- English - Master of Arts (p. 141)

Doctoral Degree(s)

- Rhetoric and Professional Communication - Doctor of Philosophy (p. 199)

Minors for the Department

- English - Undergraduate Minor (p. 641)
- Gender & Sexuality Studies - Undergraduate Minor (<http://catalogs.nmsu.edu/nmsu/arts-sciences/english/gender-sexuality-studies-ug-minor/>)
- Gender and Sexuality Studies - Graduate Minor (p. 214)
- Literature - Undergraduate Minor (p. 642)
- Medieval and Early Modern Studies - Undergraduate Minor (p. 642)
- Rhetoric and Professional Communication - Undergraduate Minor (p. 643)

Professor Elizabeth Schirmer, Department Head

Regents Professor Bejarano; **Professor** Thatcher; **Associate Professors** Banazek, Cull, Jonet, Miller-Tomlinson, Rourke, Schirmer, Sharp-Hoskins, Stolte, Wells, Williams; **Assistant Professors** House, Lanier, Nur Cooley; **College Professor** Brown; **College Associate Professors** Conley, Lawrence **College Assistant Professors** Granger, Retzinger.

E. Schirmer, Department Head, Ph.D. (California-Berkeley) – medieval literature, gender theory; B. Rourke, Associate Department Head, Director of Graduate Studies, Ph.D. (Stanford) – modern British literature, critical theory; T. Stolte, Director of Undergraduate Studies, Ph.D. (British Columbia) – 19th-century British literature and culture; K. Sharp-Hoskins, Writing Program Administrator, Ph.D. (Illinois State) – rhetoric, composition, culture, pedagogy; L. A. Williams, Program Director, Gender and Sexuality Studies, Ph.D. (Purdue) – gender and sexuality studies, media and cultural studies; K. Banazek, Director, Writing Center, Ph.D. (Pittsburgh) – rhetoric, writing studies, cultural studies, philosophy of media; C. Lanier, Director, Creative Research Center, Ph.D.

(New Mexico State) – rhetoric and professional communication; C. Bejarano, Ph.D. (Arizona State) – gender and sexuality studies, justice studies; M. Brown, M.A. (New Mexico State) – multilingual writing; R. Conley, M.A. (New Mexico State) – composition, women's literature, and film studies; Cull, Ph.D. (Illinois) – modern and contemporary American literature; M. Granger, M.A. (New Mexico State) – rhetoric and professional communication; E. House, Ph.D. (Arizona) – critical composition and writing studies; M. C. Jonet, Ph.D. (Purdue) – gender and sexuality studies, media and cultural studies; G. Lawrence, Ph.D. (UTEP) – composition, professional communication, gender studies; T. Miller-Tomlinson, Ph.D. (Yale) – Shakespeare, early modern literature and culture; S. Nur Cooley, Ph.D. (Michigan State) – cultural rhetorics and professional writing; D. Retzinger, Ph.D. (New Mexico State) – technical and professional communication; B. Thatcher, Ph.D. (Purdue) – professional communication, intercultural rhetoric; J. Wells, Ph.D. (South Carolina) – rhetorical theory and history, environmental rhetoric.

English Courses

ENGL 1105M. Intermediate ESL Composition and Grammar Review **3 Credits (3)**

Development of fluent academic writing skills, with an emphasis on grammar review for editing purposes. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): Placement based on English language screening test, and either a minimum TOEFL score of 500 or consent of instructor.

ENGL 1110G. Composition I **4 Credits (4)**

In this course, students will read, write, and think about a variety of issues and texts. They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers, and practice techniques for writing, revising, and editing.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing

ENGL 1110H. Composition I Honors **4 Credits (4)**

In this course, students will read, write, and think about a variety of issues and texts. They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers, and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1110M. Composition I Multilingual **4 Credits (4)**

In this course, students will read, write, and think about a variety of issues and texts. They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers, and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1120. Composition II**2 Credits (2)**

In this course, students will explore argument in multiple genres. Research and writing practices emphasize summary, analysis, evaluation, and integration of secondary sources. Students will analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading, writing, and research. Students will sharpen their understanding of how writing and other modes of communication work together for rhetorical purposes. The emphasis of this course will be on research methods.

Prerequisite: successful completion of ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Analyze the rhetorical situation for purpose, main ideas, support, audience, and organizational strategies in a variety of genres.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Use a variety of research methods to gather appropriate, credible information.
4. Evaluate sources, claims, and evidence for their relevance, credibility, and purpose.
5. Quote, paraphrase, and summarize sources ethically, citing and documenting them appropriately.
6. Integrate information from sources to effectively support claims as well as other purposes (to provide background information, evidence/examples, illustrate an alternative view, etc.).
7. Use an appropriate voice (including syntax and word choice).

ENGL 1410G. Introduction to Literature**3 Credits (3)**

In this course, students will examine a variety of literary genres, including fiction, poetry, and drama. Students will identify common literary elements in each genre, understanding how specific elements influence meaning.

Learning Outcomes

1. Identify, define, and understand basic literary conventions and themes in fiction, poetry and drama.
2. Write reasonable, well-supported analyses of literature that ethically integrate evidence from texts

ENGL 2130G. Advanced Composition**3 Credits (3)**

This course is for students who are striving for fluency, maturity, clarity and significance in their writing. It is an intermediate writing course that builds on and refines writing skills acquired in previous courses. It focuses on non-fiction writing for the professions, business, science, technical fields, academe and/or the popular press. Short works of master writers are studied for ideas, style and structure.

Learning Outcomes

1. Students will examine and apply different writing styles and modes used by masters of personal essay and keep a reading response journal of assigned readings as demonstrated by scoring a 70% in faculty designed assignments.
2. Students will develop a sense of audience by discussing their papers with each other in small groups during class or by reading each other's papers and participating in positive, helpful peer reviews as demonstrated by scoring a 70% in faculty designed assignments.

ENGL 2210G. Professional & Technical Communication**3 Credits (3)**

Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience.

Prerequisite(s): Grade of C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication

ENGL 2210H. Professional and Technical Communication Honors**3 Credits (3)**

Professional and Technical Communication writing for Crimson Scholars/ Honors students will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. 3.5 GPA is also required. Restricted to Las Cruces campus only.

Prerequisite(s): grade of C- or better in ENGL 1110G or the equivalent; approval of the honors college.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2210M. Professional and Technical Communication for Multilingual Students**3 Credits (3)**

Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. NMSU specific description: In this course, students will explore the unique advantages and challenges of being multilingual writers. This course is designed for international and domestic multilingual students.

Prerequisite: Grade of C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2215G. Advanced Technical and Professional Communication
3 Credits (3)

Theory and practice of writing in technical and professional fields, individualized to each student's field. Emphasizes efficient writing processes and effective written products. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): Junior or above standing, or consent of instructor.

Learning Outcomes

1. To complicate the definition of "technical and scientific communication" and its relationship(s) to studying and practicing "rhetoric."
2. To complicate our relationship to concepts like "science", "knowledge, "objectivity," neutrality, "clarity," etc.
3. To use a community-based approach to study and practice technical and scientific documents within various discourse communities.
4. To study and practice different genres (i.e. memos, letters, e-mails, reports, proposals, and instruction sets) attending to issues of audience and purpose within discourse communities.
5. To practice some mindful reading strategies that allow you to attend to the use of language and its material and discursive effects in different situations.
6. To examine the material effects of producing, circulating, and consuming technical and scientific texts on the bodies of people within different contexts.
7. To complicate our understanding of "ethics," "responsibility," and "accountability" toward ourselves and others.
8. To work collaboratively and individually to research, to analyze, and to write about public debates regarding the conduct of science and technology.
9. To understand and use basic principles of document design attending to issues of usability and accessibility. 1
10. To articulate the relationship between technical and scientific communication and issues of inclusion and social justice in the world.

ENGL 2221G. Writing in the Humanities and Social Science
3 Credits (3)

Theory and practice in interpreting texts from various disciplines in the humanities and social sciences. Strategies for researching, evaluating, constructing, and writing researched arguments. Course subtitled in the Schedule of Classes. May be repeated up to 3 credits.

Prerequisite(s): Grade of C- or better in ENGL 1110G or ENGL 1110H, or ENGL 1110M.

Learning Outcomes

1. Develop the ability to interpret and respond to humanities and social sciences texts
2. Analyze and evaluate cultural artifacts such as texts, images, and practices as a means of academic inquiry
3. Critique arguments offered in the readings to determine the underlying methodology as well as underlying values
4. Construct a rhetorical argument with evidence appropriate for an explicit audience and purpose
5. Use written, visual, or oral strategies to persuade, inform, or engage, considering situation, audience, purpose, aesthetics, and diverse points of view
6. Practice effective research strategies, and integrate research correctly and ethically from credible sources
7. Understand and apply components of the writing process such as planning, collaborating, organizing, composing, revising, and editing

ENGL 2280. History of Argument
3 Credits (3)

Investigates the major figures and movements in rhetoric from the classical period to modern rhetorical theory, examining relations between rhetorical teaching and practice, culture, epistemology, and ideology. Main campus only. **Prerequisite(s):** ENGL 1110G, or ENGL 1110GH, or ENGL 1110M

Learning Outcomes

1. Understand how rhetoric, argument, and persuasion work. Become familiar with the key terms and various contexts in which rhetoric, argument, and persuasion function and the contingencies that influence their use and effectiveness;
2. be familiar with the broad history and major figures of western rhetoric;
3. apply a number of approaches used to analyze and construct/deconstruct rhetorical arguments, including (but not limited to) Aristotelian appeals and commonplaces, stasis theory, toulmin analysis, pentadic/dramatistic analysis, fallacy analysis, and rogerian analysis;
4. complete an analysis as well as design and present a project regarding a contemporary issue or concern about which you feel deep passion and commitment; and
5. Improve general critical thinking and communication skills, both oral and written.

ENGL 2310G. Introduction to Creative Writing
3 Credits (3)

This course will introduce students to the basic elements of creative writing, including short fiction, poetry, and creative nonfiction. Students will read and study published works as models, but the focus of this "workshop" course is on students revising and reflecting on their own writing. Throughout this course, students will be expected to read poetry, fiction, and nonfiction closely, and analyze the craft features employed. They will be expected to write frequently in each of these genres.

Prerequisite(s): ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Participate in a constructive conversation and community about creative writing.
2. Read and critically engage with a variety of texts.
3. Compose creative works in various genres of creative writing.
4. Provide respectful, honest, and critical feedback to peers about their work.
5. Revise creative work based on peer feedback and critique.
6. Develop thoughtful workshop reflection on students' own writing and writing process.
7. Evaluate and engage with publication process.

ENGL 2381. Script Development and Storyboarding
3 Credits (3)

Examines effective writing principles for creating storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Crosslisted with: FDMA 2381.

Learning Outcomes

1. develop a story idea into a complete storyboard
2. describe and visualize the creative aspects of a media project from conception to completion
3. write a scene in the professional script format
4. deliver a professional verbal and visual presentation of a story idea to an audience
5. the ability to conceive, illustrate and plan a visual project
6. proficiency in oral, written, and visual communication via storyboarding, script writing and verbal presentations

ENGL 2382. Narrative: Principles of Story Across the Media
3 Credits (3)

Examines the various strategies of written and visual storytelling, narrative structure and its principal components (plot, theme, character, imagery, symbolism, point of view) with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc.

Crosslisted with: FDMA 2382

Learning Outcomes

1. Identify use the building blocks of storytelling: plot, theme, character, imagery,
2. Symbolism and point of view
3. Develop these building blocks into a cohesive narrative within a written document
4. Effectively communicate in different written formats
5. Create design documents for varied genres of media: narrative short, documentary, 6 Animation, commercial/industrial video, computer game
6. Describe how a written narrative can be translated into a visual medium

ENGL 2520G. Film as Literature**3 Credits (3+3P)**

The purpose of this course is to teach students how to analyze film as a visual text. Students will learn to analyze films, film techniques, eras, and genres. Students will also identify significant trends and developments in film-making, examining the ways in which film reflects and creates cultural trends and values.

Learning Outcomes

1. Develop an understanding of the cultural, historical, and technical contexts for various films.
2. Identify, define, and analyze basic film techniques used in different genres and time periods.
3. Analyze how film uses literature by studying different sources of adaptation.
4. Demonstrate an understanding of film in its various aspects by writing film analysis, reviews, and/or other projects.

ENGL 2521. The Bible as Literature**3 Credits (3)**

Develops informed readings of Hebrew and Christian scriptures. Emphasizes understanding Biblical literary forms, techniques, themes; historical, cultural contexts for interpretation; authorship, composition, audience for individual books; development of Biblical canon.

Learning Outcomes

1. Develop and articulate historically informed and textually supported arguments regarding the form and meaning of biblical texts
2. Express arguments and explication in clear, organized,
3. Understand the Jewish and Christian scriptures as cultural artifacts, using some fundamental techniques of literary analysis and interpretation, especially: thematic interpretation, stylistic analysis, narrative analysis, poetics, and the rhetorical analysis of figurative language.
4. Use socio-historically informed interpretive methods focused on these fundamental contextual questions : 1) who probably wrote and edited these texts, 2) why and how they most likely did so, 3) how their earliest audiences probably responded to them, and 4) why and how they were later combined to form the canonical Jewish and Christian bibles read today.
5. Know in detail substantial selections of representative, influential, and historically informative biblical texts
6. Distinguish literary critical and historical analysis of the Bible from those based on faith, tradition, authority, and theology
7. Recognize, understand, and analyze the forms, genres, and techniques used by biblical authors
8. Become familiar with and be able to use essential knowledge of the historical, cultural, and geographical contexts of Biblical writing
9. Learn how evaluate texts as historical documents, as well as how doing so relates to and differs from literary critical analysis and interpretation 1
10. Become familiar with common and influential scholarly, critical, and aesthetic ways of reading Biblical texts from a contemporary perspective 1
11. Understand the cultural influence of the Bible and its relevance for other areas of scholarly and artistic work

ENGL 2610. American Literature I**3 Credits (3)**

This course surveys American literature from the colonial period to the mid-nineteenth century. This course provides students with the contexts and documents necessary to understand the origins of American Literature and the aesthetic, cultural, and ideological debates central to early American culture.

Learning Outcomes

1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2620. American Literature II**3 Credits (3)**

This course surveys American literature from the mid-nineteenth-century to the contemporary period. This course provides students with the contexts and documents necessary to understand American literature and the aesthetic, cultural, and ideological debates central to American culture.

Learning Outcomes

1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2630. British Literature I**3 Credits (3)**

This course offers a study of British literature from its origins in Old English to the 18th century. This survey covers specific literary works--essays, short stories, novels, poems, and plays--as well as the social, cultural, and intellectual currents that influenced the literature.

Learning Outcomes

1. Read and discuss representative works of British writers from its origins in Old English to the 18th century to understand cultural and historical movements which influenced those writers and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2640. British Literature II**3 Credits (3)**

This course offers a study of British literature from the 18th century to the present. This survey covers specific literary works—essays, short stories, novels, poems, and plays—as well as the social, cultural, and intellectual currents that influenced the literature.

Learning Outcomes

1. Read and discuss representative works of British writers from the 18th century to the present to understand cultural and historical movements, which influenced those writers, and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2650G. World Literature I**3 Credits (3)**

In this course, students will read representative world masterpieces from ancient, medieval and Renaissance literature. Students will broaden their understanding of literature and their knowledge of other cultures through exploration of how literature represents individuals, ideas and customs of the world cultures. The course focuses strongly on examining the ways literature and culture intersect and define each other.

Learning Outcomes

1. Identify and comprehend key authors and literary works from ancient periods to the Enlightenment.
2. Understand each text's historical and cultural context.
3. Identify and analyze a variety of literary forms, including poetry, plays, and philosophical and religious texts.
4. Compare works from different cultures and historical periods examining genre, style, and content or theme.
5. Analyze how literary works reflect historical, national, cultural, and ethnic differences.

ENGL 2675. Transatlantic Literatures**3 Credits (3)**

This course tracks the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years. Students examine a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts. Students consider how colonization, exile, displacement, and migration have track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years reinforced or contested national literary traditions.

Learning Outcomes

1. Track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years
2. Identify and analyze a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts
3. Explain how colonization, exile, displacement, and migration have reinforced or contested national literary traditions.

ENGL 2996. Special Topics**1-3 Credits**

Emphasis on a literary and/or writing subject chosen for the semester. Repeatable for a unlimited credit under different subtitles.

Learning Outcomes

1. Varies

ENGL 301. Theory and Criticism: Rhetoric and Culture**3 Credits (3)**

Introduction to rhetorical criticism with an emphasis on understanding the theoretical and cultural underpinnings for the rhetorical analyses of texts.

ENGL 302. Theory and Criticism: Literature and Culture**3 Credits (3)**

Introduction to literary criticism, from its classical beginnings through contemporary critical approaches.

ENGL 303. Theory and Criticism: Film, Media and Culture**3 Credits (3)**

Surveys classical and contemporary film theory. Explores the relationship of theory to textual analysis and filmmaking practices. Includes auteurism semiotics, psychoanalysis, and other theories, as well as theories of other media.

ENGL 304. Creative Writing: Prose**3 Credits (3)**

Imaginative writing, chiefly prose narrative. Repeatable for a maximum of 9 credits.

ENGL 306. Creative Writing: Poetry**3 Credits (3)**

Introduction to the writing of poetry. Repeatable for a total of 9 credits.

ENGL 307. Creative Writing: Creative Nonfiction**3 Credits (3)**

Introduction to creative nonfiction. Skills emphasized will include the personal voice, powers of observation and reflection, advocacy, argument, and a creative, powerful use of language. Repeatable for a maximum of 9 credits.

ENGL 308. Creative Writing: Playwriting**3 Credits (3)**

Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: THEA 308

ENGL 309. Screenwriting I**3 Credits (3)**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Consent of instructor required. Crosslisted with: CMI 309 and THTR 306

Prerequisite(s): ENGL 235 or CMI 235.

ENGL 310. Critical Writing**3 Credits (3)**

A course in critical reading, writing, and research designed to prepare English majors for upper-division courses.

ENGL 315. Writing for the Web**3 Credits (3)**

Introduction to writing for the World Wide Web through practical application and analysis on both theory and research. Allows hands-on learning in a computer classroom.

ENGL 321V. Modern European Drama**3 Credits (3)**

Masterworks of European drama from the late 18th century to present. Crosslisted with: THEA 321V

ENGL 322. Dramatic Character**3 Credits (3)**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. Crosslisted with: THEA 322.

ENGL 323. American Drama**3 Credits (3)**

Masterworks of American drama by noted American playwrights. Crosslisted with: THEA 323

ENGL 326. Cultural Identity and Representation Across the Media**3 Credits (3)**

Considers complex relationships between representation and culture including how images and language shape racial, ethnic, gender, sexual, and class identities. Examines theories from several disciplines. Includes lecture, discussion and production exercises.

ENGL 327V. Shakespeare around the Globe**3 Credits (3)**

Introduction to multicultural issues in Shakespeare's plays and to adaptations of Shakespeare's plays in other cultures.

ENGL 328V. Literature of Science Fiction and Fantasy**3 Credits (3)**

Survey and critical examination of the development of science fiction and fantasy as literature genres through selected authors and texts.

ENGL 329. Studies in Drama**3 Credits (3)**

Emphasis on a group of related works of European or American drama; topics will vary. Crosslisted with: THEA 329 and FDMA 329

ENGL 339V. Chicana/o Literature**3 Credits (3)**

Introduction to Chicano novels, short stories and selected creative nonfiction.

ENGL 354. Form and Technique in Fiction**3 Credits (3)**

Literature course designed for fiction writers, especially those English majors in the Creative Writing emphasis. The course combines the study of published fiction with the study of craft. Some of the assignments will require the student to write original fiction based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 356. Form and Technique in Poetry**3 Credits (3)**

Literature course designed for poets, especially those English majors in the Creative Writing emphasis. The course combines the study of published poetry with the study of craft. Some of the assignments will require the student to write original poems based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 358. Form and Technique in Playwriting**3 Credits (3)**

Literature course designed for playwrights, especially those English majors in the Creative Writing emphasis. The course combines the study of published plays and performances with the study of craft. Some of the assignments will require the student to write original plays based on exercises provided by the instructor. Repeatable up to 9 credits.

ENGL 363. Literature for Children and Young Adults**3 Credits (3)**

A comparative, historical survey of literature for young (K to 12th grade) readers. Emphasis on critical evaluation.

Prerequisite: junior or above standing.

ENGL 380V. Women Writers**3 Credits (3)**

Introduction to multicultural women's traditions through intensive study of works by women writers. Crosslisted with: GNDR 380V.

ENGL 392V. Mythology**3 Credits (3)**

Greek and Roman mythology and its impact on European and English literature. Readings in myths, classical plays, and other literature with mythological interest, including nonclassical myths.

ENGL 394V. Southwestern Literature**3 Credits (3)**

Introduction to multicultural literature of the Southwest: oral folk literature, literary fiction (classic and contemporary), nonfiction and poetry.

ENGL 399. Special Topics**3 Credits (3)**

Emphasis on a theme, genre, figure, or technique chosen for study during the semester. Repeatable under different subtitles.

ENGL 400. Independent Study: Upper Division**1-3 Credits**

For students with demonstrated aptitude for independent work. Approval of instructor required before registration. Repeatable under different subtitles.

ENGL 403. Web Design and Development**3 Credits (3)**

Combines study and practice of web design and development as rhetoric, technical, processual, and collaborative.

Learning Outcomes

1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility
5. Create usable, aesthetically pleasing, and functional websites

ENGL 404. User Experience and Assistance**3 Credits (3)**

Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.

Learning Outcomes

1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions.

ENGL 405. Chaucer**3 Credits (3)**

Principal works, with emphasis on *The Canterbury Tales*.

ENGL 407. Milton**3 Credits (3)**

Studies in Milton's works, including *Paradise Lost*.

Learning Outcomes

1. Analyze Milton's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Milton's poetry and prose;
3. Demonstrate ability to locate Milton's writings in historical and cultural context;
4. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a Working Bibliography and Research Paper on a topic related to our course material.

ENGL 408. Shakespeare I**3 Credits (3)**

Study in Shakespeare's early poems and plays. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 409. Shakespeare II**3 Credits (3)**

Study in Shakespeare's later plays. ENGL 408 is not a prerequisite. Repeatable for up to six credits under different subtitles. Crosslisted with THEA 409.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

ENGL 412. Writing in the Workplace**3 Credits (3)**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 413. Advanced Creative Writing: Prose Workshop**3 Credits (3)**

Imaginative writing, chiefly the narrative. May be repeated up to 12 credits.

Prerequisite(s): ENGL 304 or consent of instructor.

ENGL 414. Advanced Creative Writing: Poetry Workshop**3 Credits (3)**

For advanced writers of poetry. Repeatable for a total of 12 credits.

Prerequisite(s): ENGL 306 or consent of instructor.

ENGL 416. Approaches to Literature**3 Credits (3)**

Understanding, appreciation, techniques of instruction in the high school.

Prerequisite: at least 6 credits in upper-division English courses.

ENGL 417. Advanced Study in Critical Theory**3 Credits (3)**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301-303, strongly recommended. Repeatable under different subtitles.

ENGL 419. Modern Rhetorical Theory**3 Credits (3)**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the twentieth century.

ENGL 422. Advanced Study in a Literary Form or Genre**3 Credits (3)**

Close study of a topic in a particular literary form or genre. May be repeated under different subtitles.

ENGL 423. Advanced Study in a Major Author**3 Credits (3)**

Close study of selected works by a major author. May be repeated under different subtitles.

ENGL 430. Online Publishing**3 Credits (3)**

This three-credit course provides a theoretical background for online publishing and design as well as hands on experience publishing an online arts magazine.

ENGL 431. Technical Editing**3 Credits (3)**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 433. Victorian Literature**3 Credits (3)**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 442. Modern and Contemporary American Poetry**3 Credits (3)**

Studies the development of American poetry from World War I to the present. Repeatable under a different subtitle. May be repeated up to 6 credits.

ENGL 445. Postmodern Fiction**3 Credits (3)**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 446. Advanced Creative Writing: Nonfiction Prose**3 Credits (3)**

This workshop-format class for advanced writers will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 546. May be repeated up to 12 credits.

Prerequisite(s): ENGL 307 or consent of instructor.

ENGL 449. Advanced Study in Writing**3 Credits (3)**

Close study of a topic in composition, rhetoric and/or technical and professional communication. Repeatable for a maximum of 6 credits with permission of department.

ENGL 453. World Literatures**3 Credits (3)**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 458. Latino/a Literature and Culture**3 Credits (3)**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 460. Proposal Writing**3 Credits (3)**

Developing proposals and grants in a workshop setting.

ENGL 469. Advanced Study in American Literature**3 Credits (3)**

Covers selected works for a particular period of American literary history. Repeatable under different subtitles.

ENGL 470. Approaches to Composition**3 Credits (3)**

Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.

ENGL 471 M. Scholarly Writing for International Graduate Students**3 Credits (3)**

Instruction and practice in writing major academic genres, including experimental, descriptive, and problem-solution research reports, proposals, and library referenced papers. May be repeated up to 3 credits. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): Placement based on English language screening test or successful completion of ENGL 1105M; a minimum TOEFL score of 500 or consent of instructor; and successful completion of SPCD 108/490 where indicated by placement.

ENGL 478. Document Design**3 Credits (3)**

Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.

ENGL 479. Computers and Writing**3 Credits (3)**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 481. Women's Literature**3 Credits (3)**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 485 M. International Teaching Assistant Development**3 Credits (3)**

Prepares international graduate students for teaching assignments in their field of study and work at NMSU. Assists international/multilingual graduate students in developing communication and teaching studies necessary to fulfill duties their duties as teaching assistants at NMSU.

Learning Outcomes

1. Demonstrate effective communication strategies as an instructor
2. Apply a variety of teaching strategies to present and explain content in your academic field
3. Demonstrate understanding of different aspects of undergraduate education in the United States
4. Demonstrate understanding of diverse student populations at NMSU

ENGL 489. Cultural Studies: Literature and Theory**3 Credits (3)**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 497. Internship**3-6 Credits (3-6)**

Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.

ENGL 500. Supervised Study**1-3 Credits**

To prepare the student for the master's degree examinations by special studies in fields not covered in routine course work.

Prerequisite: consent of instructor.

ENGL 501. Online Publishing**3 Credits (3)**

This three-credit course provides a theoretical background for online publishing and design as well as hands-on experience publishing an online arts magazine. Taught with ENGL 430.

ENGL 502. Critical Conversations in Technical and Professional Communication**3 Credits (3)**

Introduces students to critical histories, theories, and key concepts in technical and professional communication across academic and industry boundaries.

Learning Outcomes

1. Understand the histories and politics of emergence of technical and professional communication as a field of study and expertise;
2. Identify and track key concepts, terms, and conversations that give shape to technical and professional communication;
3. Draw on a range of theories and methodologies to articulate and critique the function and effects of technical and professional communication;
4. Participate in disciplinary conversations through research and writing.

ENGL 503. Web Design and Development**3 Credits (3)**

Combines study and practice of web design and development as rhetorical, technical, processual, and collaborative.

Learning Outcomes

1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility

ENGL 504. User Experience and Assistance**3 Credits (3)**

Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.

Learning Outcomes

1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions

ENGL 505. Graduate Study in Chaucer**3 Credits (3)**

Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. May be repeated up to 3 credits.

ENGL 507. Special Topics in Rhetoric and Technical and Professional Communication**3 Credits (3)**

Seminar course centered on contemporary issues in rhetoric and technical and professional communication. Repeatable under different subtitles, for up to 6 credits.

Learning Outcomes

1. Use rhetoric inquiry and theory to contextualize and study technical and professional communication.
2. Understand the disciplinary overlaps, tensions, and possibilities among rhetoric and technical and professional communication.
3. Track a contemporary thematic trend, issue, or question through rhetoric and technical and professional communication.

ENGL 508. Graduate Study in Shakespeare I**3 Credits (3)**

Graduate study in Shakespeare's early poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 509. Graduate Study in Shakespeare II**3 Credits (3)**

Study in Shakespeare's late poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 510. Proseminar in Rhetoric and Professional Communication**3 Credits (3)**

Introduction to research in rhetoric and professional communication. Taught with ENGL 610.

ENGL 512. Graduate Study in Writing in the Workplace**3 Credits (3)**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 513. Creative Writing Workshop: Fiction**3 Credits (3)**

Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. May be repeated for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.

ENGL 514. Creative Writing Workshop: Poetry**3 Credits (3)**

Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.

ENGL 516. Graduate Study in Approaches to Literature**3 Credits (3)**

Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research.

Prerequisite: at least 6 credits in upper-division English courses.

ENGL 517. Graduate Study in Critical Theory**3 Credits (3)**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.

ENGL 518. History of Rhetoric**3 Credits (3)**

An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

ENGL 519. Graduate Study in Modern Rhetorical Theory**3 Credits (3)**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.

ENGL 521. Graduate Study in a Literary Period or Movement**3 Credits (3)**

Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 522. Graduate Study in a Literary Form or Genre**3 Credits (3)**

Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 523. Graduate Study of a Major Author**3 Credits (3)**

Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 524. Graduate Study in a Major Text**3 Credits (3)**

Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 525. Graduate Study in Comparative Literature**3 Credits (3)**

Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Repeatable under different subtitles.

Prerequisite: graduate standing or consent of instructor.

ENGL 526. Special Topics in Critical Theory**3 Credits (3)**

Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.

ENGL 527. Graduate Study in Film and Digital Media**3 Credits (3)**

Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.

ENGL 531. Technical Editing**3 Credits (3)**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 533. Victorian Literature**3 Credits (3)**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 534. Graduate Study: Form and Technique in Fiction**3 Credits (3)**

Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.

ENGL 535. Graduate Study: Form and Technique in Poetry**3 Credits (3)**

Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 12 credits.

ENGL 536. The Borderlands Writing Project**3-6 Credits (3-6)**

Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536

ENGL 542. Modern and Contemporary American Poetry**3 Credits (3)**

Studies the development of American poetry from World War I to the present. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 543. Multimedia Theory and Production**3 Credits (3)**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.

ENGL 544. Modern British Fiction**3 Credits (3)**

Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 545. Postmodern Fiction**3 Credits (3)**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 546. Advanced Creative Writing: Nonfiction Prose**3 Credits (3)**

This graduate-level workshop will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 446 with additional work required at the graduate level. Consent of Instructor required. Crosslisted with: ENGL 446.

ENGL 548. Graduate Study in Empirical Research**3 Credits (3)**

Introduction to empirical research methods in composition, professional communication, and rhetoric.

ENGL 549. Graduate Study in Writing**3 Credits (3)**

Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.

ENGL 550. Graduate Study in Literacy**3 Credits (3)**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.

ENGL 552. Graduate Study in History of the English Language**3 Credits (3)**

This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

ENGL 553. World Literatures**3 Credits (3)**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 555. Graduate Study in Rhetoric of Scientific Literature**3 Credits (3)**

Intensive study of the rhetoric of selected works of scientific literature.

ENGL 558. Latino/a Literature and Culture**3 Credits (3)**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 560. Proposal and Grant Writing**3 Credits (3)**

Developing proposals and grants in a workshop setting.

ENGL 561. Topics in Writing Program Administration**3 Credits (3)**

Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.

ENGL 563. Graduate Study in English Literature**3 Credits (3)**

Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

ENGL 564. History and Theory of Composition Studies**3 Credits (3)**

Studies in the history and theory of composition as a discipline. Taught with ENGL 664.

ENGL 565. Intercultural Rhetoric and Professional Communication**3 Credits (3)**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.

ENGL 567. Documentary Film Theory and Criticism**3 Credits (3+3P)**

Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

ENGL 568. Rhetoric and Cultural Studies**3 Credits (3)**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.

ENGL 569. Graduate in American Literature**3 Credits (3)**

A group of works from a particular period of American literary history. Repeatable under different subtitles.

ENGL 570. Graduate Study in Approaches to Composition**3 Credits (3)**

Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.

ENGL 571. Composition Pedagogy and Practicum**3 Credits (3)**

Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.

ENGL 572. Technical-Professional Communication Pedagogies**3 Credits (3)**

Combines theoretical and practical attention to the pedagogies that underwrite the teaching of technical and professional communication; culminates in the development of a TPC course proposal, syllabus, and rationale. For Graduate students only.

Learning Outcomes

1. Engage with research and scholarship that reflects a range of approaches to conceptualize the purposes and goals of technical and professional communication courses;
2. Articulate a range of possibilities for and responsibilities of technical and professional communication pedagogy;
3. Compose and substantiate a teaching philosophy and course plan for teaching technical and professional communication.

ENGL 574. Workshop: Advanced Writing Prose**3 Credits (3)**

Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 575. Workshop: Advanced Writing Poetry**3 Credits (3)**

Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 576. Workshop: Advanced Writing Playwriting**3 Credits (3)**

Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.

ENGL 577. Workshop: Advanced Technical and Professional Writing**3 Credits (3)**

Intensive practice in technical and professional writing and editing in a workshop environment. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 578. Topics in Rhetoric and Technology**3 Credits (3)**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.

ENGL 579. Computers and Writing**3 Credits (3)**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 580. Graduate Problems in Creative Writing**3 Credits (3)**

Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.

ENGL 581. Women's Literature**3 Credits (3)**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 582. Gender and Popular Culture**3 Credits (3)**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 583. Critical Writing Studies**3 Credits (3)**

Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.

ENGL 584. Workshop: Advanced Academic Writing for International Students**3 Credits (3)**

This workshop-based course is for graduate-level multilingual writers from all disciplines who want to improve their English academic writing in an intensive and collaborative environment. Students will propose a major writing project to workshop throughout the semester, such as dissertation, thesis, comprehensive exams, etc. Some of the topics covered will be academic language, cohesion/coherence, organization, and supporting academic arguments. Other topics to be determined by needs of the class.) 4.Consent of instructor.

Prerequisite(s): 1.Be classified as a graduate student by the Graduate School 2.Be classified as an international student whose first language is not English 3.Have a major writing project in progress (comprehensive exams, thesis, dissertation, conference paper, etc.

ENGL 585. Advanced Writing Workshop: RPC Capstone**3 Credits (3)**

Students work to develop and revise their chosen Master's program Capstone Project (a portfolio, thesis or master essay) in consultation with instructor and classmates. Students provide and receive feedback on their work-in-progress. Consent of Instructor required.

ENGL 589. Cultural Studies: Literature and Theory**3 Credits (3)**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 590. Master's Seminar in Rhetoric**3 Credits (3)**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.

ENGL 592. Master's Theory, Practice, and Profession**3 Credits (3)**

Students will study major poetics/narratology pieces in the field and other related professional topics such as literary citizenship, publishing, and job seeking skills. Students will also propose and develop a year-long project in one of the above categories, such as a community reading or workshop, a conference panel proposal, a paper presentation, a chapbook press launch, writing/placing literary book reviews, or work on an outreach project. Must be taken in each of the last two semesters of the MFA and currently with ENGL 594 (Master's Workshop). Restricted to MFA-Creative Writing students, or by consent of instructor.

Learning Outcomes

1. Understand, analyze, and effectively use the critical discourse of poetics/narratology/craft in the field of creative writing
2. Design and execute an outreach or professional project that contributes to a creative writing community
3. Explore applications of their training in professional contexts.
4. Analyze how students' own reading, writing, and research respond to existing leadership in professional creative writing communities, help provide new leadership, and answer community needs.

ENGL 594. Master's Workshop**3 Credits (3)**

Students will submit a draft of their thesis project, in their major genre, for workshop critique. Revision of the thesis draft will be submitted to the instructor. Restricted to MFA Creative Writing students, or by consent of instructor. Must be taken in each of the last two semesters of the MFA, and concurrently with ENGL 592 (Master's Theory, Practice, and Profession).

Learning Outcomes

1. Understand, analyze, and effectively use the critical discourse of the field of creative writing to discuss a thesis.
2. Examine how their thesis operates with the genre and within the context of contemporary literature.
3. Critically contextualize their thesis and those of their peers
4. Apply various revision strategies across a thesis-length manuscript, responding to the critiques of the instructor and their peers
5. Achieve the standards of publication of the University's thesis editor and learn those of the publishing environment in their genre.

ENGL 595. Master's Workshop: Poetry**3-6 Credits (3-6)**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 596. Master's Workshop: Fiction**3-6 Credits (3)**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 597. Internship in Technical and Professional Communication**3-6 Credits (3-6)**

Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 598. Master's Essay**3 Credits (3)**

Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.

ENGL 599. Master's Thesis**1-15 Credits**

Thesis.

ENGL 600. Doctoral Research**1-15 Credits**

Assigns credit for research performed prior to the doctoral comprehensive examination.

ENGL 601. Qualitative Research**3 Credits (3)**

Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.

ENGL 602. Quantitative Research**3 Credits (3)**

Theory and practice of designing quantitative research studies and of collecting and analyzing data. Emphasis on quantitative methods of research in composition, professional communication, and rhetoric.

ENGL 604. Digital Research Methods**3 Credits (3)**

This course will serve as one of the core methods courses in the RPC PhD program, focusing on "digital" methods in rhetorical studies. As such, the aim of this class is to help you begin to gain confidence in conducting research in rhetoric, professional communication, and composition using digital methods. In this course we will assume that digital methods in rhetoric take broadly two forms: first, digital methods of acquisition, processing, and presentation of research data. And second, digital methods of production and circulation of rhetorical objects. The former closely resembles the methods of "digital humanities" while the latter will be closer to media archaeology and "critical making" practices. In all cases, we will relate these tools and methods to key questions and theories in our field, asking how and why we might apply digital methods in rhetorical scholarship.

Prerequisite(s): graduate standing.

ENGL 610. Proseminar in Rhetoric and Professional Communication**3 Credits (3)**

Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.

ENGL 643. Multimedia Theory and Production**3 Credits (3)**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.

ENGL 649. Graduate Study in Writing**3 Credits (3)**

Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.

ENGL 650. Graduate Study in Literacy**3 Credits (3)**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.

ENGL 661. Topics in Writing Program Administration**3 Credits (3)**

Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.

ENGL 664. History and Theory of Composition Studies**3 Credits (3)**

Studies in the history and theory of composition as a discipline. Taught with ENGL 564.

ENGL 665. Intercultural Rhetoric and Professional Communication**3 Credits (3)**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.

ENGL 668. Rhetoric and Cultural Studies**3 Credits (3)**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.

ENGL 678. Topics in Rhetoric and Technology**3 Credits (3)**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.

ENGL 683. Critical Writing Studies**3 Credits (3)**

This course investigates the field of Writing Studies as a distinct field of study, related to but not synonymous with Composition Studies. While debates surrounding the relationships among Writing Studies and Composition Studies flourish, this course centers on the former—investigating writing as a practice, process, and object that merits attention in its own right. Such attention will be grounded in contemporary critical and cultural theory that contests writing as a positive or neutral sign (i.e. activity theory, posthumanism, ecocriticism, new materialism, new media studies; feminist, queer, critical race or decolonial theory). Crosslisted with: ENGL 583.

Prerequisite(s): graduate standing.

ENGL 690. Doctoral Seminar in Rhetoric**3 Credits (3)**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.

ENGL 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

Phone: (575) 646-3931

Website: <https://english.nmsu.edu/>

NOTE: The MFA in Creative Writing, with its faculty, have moved to the Creative Media Institute as of Fall 2022:

CMI phone: (575) 646-5671

<https://cmi.nmsu.edu/>

English (Creative Writing) - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student majoring in Creative Writing must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10
English Composition - Level 1 ¹		

English Composition - Level 2 ¹		
Oral Communication ¹		
Area II: Mathematics ^{1,2}		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
ENGL 310	Critical Writing ⁴	3
Select three from the following: ^{4,5}		9
ENGL 2521	The Bible as Literature	
ENGL 2610	American Literature I	
ENGL 2620	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630	British Literature I	
ENGL 2640	British Literature II	
Select one from the following: ⁴		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Select a minimum of two different Creative Writing workshops from the following:		6
ENGL 304	Creative Writing: Prose	
ENGL 306	Creative Writing: Poetry	
ENGL 307	Creative Writing: Creative Nonfiction	
ENGL 308	Creative Writing: Playwriting	
ENGL 309	Screenwriting I	
Select two advanced Creative Writing Workshops from the following (300-level workshops are prerequisites for 400-level workshops in the same genre):		6
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
ENGL 446	Advanced Creative Writing: Nonfiction Prose	
Select two from the following:		6
ENGL 354	Form and Technique in Fiction	
ENGL 356	Form and Technique in Poetry	
ENGL 358	Form and Technique in Playwriting	
Select 9 additional credits from English courses numbered 400-499.		9
Second Language Requirement: (required- see the section at the bottom of the page)		0-8
Electives, to bring the total credits to 120⁶		29-40
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;

- HNRS 2171G The Worlds of Arthur, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;
- ⁵ These 18 credits should be completed before the student enrolls in 400 level courses.
- ⁶ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in Creative Writing, there is a one year second language requirement; the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120 OR	Mandarin Chinese II French II German II Japanese II Spanish II	4
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3

or SPAN 1220 or SPAN 2210	Spanish for Heritage Learners II Spanish for Heritage Learners III
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Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course ²		3
Area VI: Creative and Fine Arts Course ²		3
ENGL 2310G	Introduction to Creative Writing	3
Area III: Laboratory Science Course ²		4
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Elective Course(s)		4
Credits		30
Sophomore		
Choose from one of the following: ¹		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2130G	Advanced Composition	
Area III: Laboratory Science Course OR Area IV: Social And Behavioral Science Course ²		3-4
2000-level ENGL requirement ¹		9
First in Second Language Series of Courses		3-4
Next Course in Second Language Series ¹		3-4

ENGL Creative Writing Workshop Course ^{1,3}	3
General Education Elective Course ²	3-4
Elective Course(s)	3
Credits	30-34
Junior	
ENGL 310 Critical Writing	3
Choose from one of the following:	3
ENGL 354 Form and Technique in Fiction	
ENGL 356 Form and Technique in Poetry	
ENGL 358 Form and Technique in Playwriting	
ENGL Creative Writing Workshop Course ³	3
ENGL Advanced Creative Writing Workshop Course	3
Choose from one of the following:	3
ENGL 354 Form and Technique in Fiction	
ENGL 356 Form and Technique in Poetry	
ENGL 358 Form and Technique in Playwriting	
Choose from one of the following:	3
ENGL 301 Theory and Criticism: Rhetoric and Culture	
ENGL 302 Theory and Criticism: Literature and Culture	
ENGL 303 Theory and Criticism: Film, Media and Culture	
VWW: Viewing a Wider World Course ⁴	6
Elective Course	3
Upper-Division Elective Course	3
Credits	30
Senior	
ENGL Advanced Creative Writing Workshop Course ^{1,5}	3
ENGL Elective Course (400-499 level) ¹	3
ENGL Elective Course (400-499 level) ¹	6
Upper-Division Elective Courses ¹	9
Elective Course(s)	9
Credits	30
Total Credits	120-124

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ **Creative Writing Workshop Courses:**

- ENGL 304 Creative Writing: Prose
- ENGL 306 Creative Writing: Poetry
- ENGL 307 Creative Writing: Creative Nonfiction
- ENGL 308 Creative Writing: Playwriting
- ENGL 309 Screenwriting I

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ **Advanced Creative Writing Workshop Courses:**

- ENGL 413 Advanced Creative Writing: Prose Workshop
- ENGL 414 Advanced Creative Writing: Poetry Workshop
- ENGL 446 Advanced Creative Writing: Nonfiction Prose

English - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student majoring in English must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹		
<i>Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
ENGL 310	Critical Writing ⁴	3
Select four from the following: ^{4,5}		12
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610	American Literature I	
ENGL 2620	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630	British Literature I	
ENGL 2640	British Literature II	
Select one from the following: ⁴		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Select 6 additional credits from English courses numbered 2996-399.		6
Students may count 1 or 2 of the following Honors courses towards the requirement of 6 hours of 300-level electives:		
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle ⁶	
Students may count the following Honors course towards the requirement of 6 hours of 300-level electives		
Select one from the following (The following courses may fulfill this requirement at the discretion of the Director of Undergraduate Studies, if their content is primarily American literature: ENGL 422, 423, 445, 481, 489, 500):		3
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 405	Chaucer	3

or ENGL 407	Milton	
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
Select 9 additional credits from English courses numbered 400-499.		9
Second Language Requirement: (required- see the section at the bottom of the page)		0-8
Electives, to bring the total credits to 120 ⁷		29-40
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

⁵ These 15 credits should be completed before the student enrolls in 400-level courses.

⁶ Students may not take both ENGL 392V Mythology and HNRS 348V Comparative Mythology: Myth, Ritual, and the Life Cycle.

⁷ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in English, there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		

SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6
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Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
<i>OR</i>		

Challenge the 1120/1220/2210 level for the following courses:

PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
FYEX 1112	The Freshman Year Experience	3

Area IV: Social and Behavioral Science Course ²	3
Area VI: Creative and Fine Arts Course ²	3
Choose from one of the following:	3
COMM 1115G Introduction to Communication	
HNRS 2175G Introduction to Communication Honors	
ACOM 1130G Effective Leadership and Communication in Agriculture	
2000-level ENGL Course	3
Area III: Laboratory Science Course ²	4
Area V: Humanities Course ²	3
Elective Course	1

Credits **30**

Sophomore

Choose from one of the following:	3
ENGL 2210G Professional & Technical Communication ¹	
ENGL 2215G Advanced Technical and Professional Communication ¹	
ENGL 2221G Writing in the Humanities and Social Science ¹	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course	3-4
First Course in Second Language Series	3-4
Next Course in Second Language Series	3-4
2000-level ENGL Courses	9
General Education Elective Course ²	3-4
Elective Courses	6

Credits **30-34**

Junior

ENGL 310 Critical Writing	3
ENGL Courses (2996 - 399 level)	6
VWW: Viewing a Wider World Course ³	6
Choose from one of the following:	3
ENGL 301 Theory and Criticism: Rhetoric and Culture	
ENGL 302 Theory and Criticism: Literature and Culture	
ENGL 303 Theory and Criticism: Film, Media and Culture	
Upper-Division Elective Course	6
Elective Course	6

Credits **30**

Senior

Choose from one of the following:	3
ENGL 405 Chaucer (offered Spring only)	
ENGL 407 Milton (offered fall only)	
ENGL Upper-Division Course (400-499 level)	9
ENGL American Literature Course	3
Choose from one of the following:	3
ENGL 408 Shakespeare I (offered Fall only)	
ENGL 409 Shakespeare II (offered Spring only)	
Upper-Division Elective Course	9
Elective Course	3

Credits **30**

Total Credits **120-124**

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

English (Literature, Language and Culture) - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student majoring in English must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
ENGL 310 Critical Writing ⁴		3
Select four from the following, of which three must be taken from courses numbered 2610-2640 ^{4,5}		12
ENGL 2610 American Literature I		
ENGL 2620 American Literature II		
ENGL 2630 British Literature I		
ENGL 2640 British Literature II		
ENGL 2310G Introduction to Creative Writing		
ENGL 2521 The Bible as Literature		
ENGL 2280 History of Argument		
Select one from the following: ⁴		3
ENGL 301 Theory and Criticism: Rhetoric and Culture		
ENGL 302 Theory and Criticism: Literature and Culture		
ENGL 303 Theory and Criticism: Film, Media and Culture		
Select one English Literature course from the following:		3
ENGL 321V Modern European Drama		
ENGL 322 Dramatic Character		
ENGL 323 American Drama		
ENGL 327V Shakespeare around the Globe		
ENGL 328V Literature of Science Fiction and Fantasy		
ENGL 329 Studies in Drama		
ENGL 339V Chicana/o Literature		
ENGL 363 Literature for Children and Young Adults		

ENGL 380V	Women Writers	
ENGL 392V	Mythology	
ENGL 394V	Southwestern Literature	
Select 3 additional credits from English courses numbered 2996-399		3
Students may count the following Honors course towards the requirement of 6 hours of 300-level electives:		
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle ⁶	
Select one from the following (The following courses may fulfill this requirement at the discretion of the Director of Undergraduate Studies, if their content is primarily American literature: ENGL 422, 423, 445, 481, 489, 500):		3
ENGL 469	Advanced Study in American Literature	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
Select one from the following:		3
ENGL 405	Chaucer	
ENGL 407	Milton	
Select one from the following:		3
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
Select two additional English Literature courses from the following (405 and 407 may count towards this requirement once the above 405/407 requirement has been fulfilled. 408 and 409 may count towards this requirement once the above 408/409 requirement has been fulfilled. 469 may count towards this requirement once the above 469/442/458 requirement has been met.):		3
ENGL 417	Advanced Study in Critical Theory	
ENGL 422	Advanced Study in a Literary Form or Genre	
ENGL 423	Advanced Study in a Major Author	
ENGL 433	Victorian Literature	
ENGL 445	Postmodern Fiction	
ENGL 453	World Literatures	
ENGL 481	Women's Literature	
ENGL 489	Cultural Studies: Literature and Theory	
Select 3 additional credits from English courses numbered 400-499.		3
Second Language Requirement: (required- see the section at the bottom of the page)		0-8
Electives, to bring the total credits to 120 ⁷		32-43
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

⁵ These 15 credits should be completed before the student enrolls in 400-level courses.

⁶ Students may not take both ENGL 392V Mythology and HNRS 348V Comparative Mythology: Myth, Ritual, and the Life Cycle.

⁷ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor

coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in Literature, Language and Culture, there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4
<i>OR</i>		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course ²		3
Area VI: Creative and Fine Arts Course ²		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course ²		4
Area III: Laboratory Science Course ²		3
2000-level ENGL requirement		3
Elective Course		1
Credits		30
Sophomore		
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication ¹	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
ENGL 2215G	Advanced Technical and Professional Communication ¹	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course ²		3-4
General Education Elective Course ²		3
First Course in Second Language Series		3-4
Next Course in Second Language Series ¹		3-4
2000-level ENGL requirement		3
2000-level ENGL Courses		6
Elective Courses		6
Credits		30-33

Junior

ENGL 310	Critical Writing	3
VWW: Viewing a Wider World Course ³		6
One ENGL Literature Course		3
Choose from one of the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL Course (2996 - 399 level)		3
Upper-Division Elective Course		3
Elective Courses		9
Credits		30

Senior

Choose from one of the following:		3
ENGL 405	Chaucer (offered Spring only)	
ENGL 407	Milton (offered Fall only)	
ENGL American Literature Course		3
ENGL Course (400-499 level)		3
Choose from one of the following:		3
ENGL 408	Shakespeare I (offered Fall only)	
ENGL 409	Shakespeare II (offered Spring only)	
ENGL Literature Courses (400-level)		6
Upper-Division Elective Courses		9
Elective Courses		3
Credits		30
Total Credits		120-123

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student pursuing a concentration in Rhetoric, Digital Media, and Professional Communication must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		

<i>Oral Communication</i> ¹		
Area II: Mathematics ^{1,2}		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Sciences Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Social/Behavioral Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
ENGL 310	Critical Writing ⁴	3
Select four from the following: ^{4,5}		12
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610	American Literature I	
ENGL 2620	American Literature II	
ENGL 2280	History of Argument ((recommended))	
ENGL 2630	British Literature I	
ENGL 2640	British Literature II	
Select one from the following: ⁴		3
ENGL 301	Theory and Criticism: Rhetoric and Culture (recommended)	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture (recommended)	
<i>Rhetoric and Composition</i>		
Select two from the following: ⁵		6
ENGL 419	Modern Rhetorical Theory	
ENGL 449	Advanced Study in Writing	
ENGL 470	Approaches to Composition	
<i>Professional Communication</i>		
Select two from the following: ⁵		6
ENGL 403	Web Design and Development	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 460	Proposal Writing	
ENGL 497	Internship	
<i>Digital Rhetoric and Design</i>		
Select two from the following: ⁵		6
ENGL 315	Writing for the Web	
ENGL 326	Cultural Identity and Representation Across the Media	
ENGL 404	User Experience and Assistance	
ENGL 430	Online Publishing	
ENGL 449	Advanced Study in Writing	
ENGL 478	Document Design	
<i>Additional Courses</i>		
Select 6 credits of upper division level, advisor-approved English courses relevant to program of study. ⁶		6
Second Language Requirement: (required- see the section at the bottom of the page)		0-8
Electives, to bring the total credits to 120⁷		29-40
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I.

⁵ These 18 credits should be completed before the student enrolls in 400 level courses.

⁶ Students must take a total of 12 credit hours at the 400 level or above.

⁷ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in Rhetoric, Digital Media and Professional Communication, there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
<i>OR</i>		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course ²		3
Area VI: Creative and Fine Arts Course ²		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area III: Laboratory Science Course ²		4
Area III: Humanities Course ²		3
2000-level ENGL requirement		3

Elective Course		1
Credits		30
Sophomore		
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2130G	Advanced Composition	
Area III: Laboratory Science Course OR Area IV: Human and Behavioral Science Course ²		3
2000-level ENGL requirement courses		9
First Course in Second Language Series		3-4
Next Course in Second Language Series ¹		3-4
General Education Elective Course ²		3-4
Elective Courses		6
Credits		30-33
Junior		
ENGL 310	Critical Writing	3
Choose from one of the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
VWW: Viewing a Wider World Course ³		6
ENGL Rhetoric and Composition Elective Course		6
ENGL Professional Communication Elective Course		3
Elective Courses		9
Credits		30
Senior		
ENGL Professional Communication Elective Course		3
ENGL Digital Rhetoric and Design Elective Course		6
ENGL Course (300 - 499 level)		6
Upper-Division Elective Courses		12
Elective Course		3
Credits		30
Total Credits		120-123

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

English - Undergraduate Minor

Students not earning a bachelor's degree in English are eligible to pursue a minor in English. Students must earn 18 credits from the approved course lists below. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English.

Prefix	Title	Credits
Requirements		
Select 6 credits from the following: ¹		6
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	

ENGL 2610	American Literature I	
ENGL 2620	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630	British Literature I	
ENGL 2640	British Literature II	
Select one from the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 310	Critical Writing	
Select 6 credits from English courses numbered 300-499.		6
Select three additional credits from English courses numbered 400-499.		3
Total Credits		18

¹ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

Literature - Undergraduate Minor

Students not earning a bachelor's degree in English with a concentration in Literature, Language and Culture are eligible to pursue a minor in Literature. Students must earn 18 credits from the approved course lists below. At least 12 credits must be upper division. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a BA in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Literature.

Prefix	Title	Credits
Requirements		
Select two from the following: ¹		6
ENGL 2521	The Bible as Literature	
ENGL 2610	American Literature I	
ENGL 2620	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630	British Literature I	
ENGL 2640	British Literature II	
Select one from the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture (recommended)	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 310	Critical Writing	
Select one from the following:		3
ENGL 321V	Modern European Drama	
ENGL 323	American Drama	
ENGL 326	Cultural Identity and Representation Across the Media	
ENGL 328V	Literature of Science Fiction and Fantasy	
ENGL 329	Studies in Drama	
ENGL 339V	Chicana/o Literature	

ENGL 363	Literature for Children and Young Adults	
ENGL 380V	Women Writers	
ENGL 392V	Mythology	
ENGL 394V	Southwestern Literature	
ENGL 399	Special Topics (with advisor approval)	
<i>Substitutions Allowed</i>		
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	
Select two from the following:		6
ENGL 405	Chaucer	
ENGL 407	Milton	
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
ENGL 417	Advanced Study in Critical Theory	
ENGL 422	Advanced Study in a Literary Form or Genre	
ENGL 423	Advanced Study in a Major Author	
ENGL 433	Victorian Literature	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 445	Postmodern Fiction	
ENGL 453	World Literatures	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 489	Cultural Studies: Literature and Theory	
Total Credits		18

¹ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

Medieval and Early Modern Studies - Undergraduate Minor

Students must earn 18 credits from the approved course lists below. At least 9 credits must be upper division. No more than 9 credits may be taken under faculty in any department. Students may request approval for other courses clearly related to Medieval and/or Early Modern Studies from the undergraduate advisor in the Department of English in consultation with faculty in medieval and early modern studies.

Prefix	Title	Credits
Requirements		
Select three from the following:		9
ARTH 2110G	History of Art I	
ENGL 2521	The Bible as Literature	
ENGL 2630	British Literature I	
ENGL 2650G	World Literature I	
HIST 1150G	Western Civilization I	
HIST 2250G	East Asia to 1600	
HIST 2245G	Islamic Civilization to 1500	
HNRS 2120G	Foundations of Western Culture	
HNRS 2160G	New Testament as Literature	
HNRS 2171G	The Worlds of Arthur	

HNRS 2175G	Introduction to Communication Honors	
Select 9 credits from the following:		9
ARTH 300	Special Topics in Art History ¹	
ARTH 305	Medieval Art	
ARTH 477	Independent Research in Art History ¹	
ARTH 478	Seminar in Art History ¹	
ENGL 380V	Women Writers ¹	
ENGL 392V	Mythology	
ENGL 405	Chaucer	
ENGL 407	Milton	
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
ENGL 422	Advanced Study in a Literary Form or Genre ¹	
ENGL 423	Advanced Study in a Major Author ¹	
ENGL 481	Women's Literature ¹	
GNDR 484	Women's Literature	
FREN 381	Survey of French Literature I	
FREN 451	Special Topics in French ¹	
HIST 311V	Colonial Latin America	
HIST 323	Cultural History of Later Imperial China	
HIST 372	Roman Civilization	
HIST 383	Germany	
HIST 387	Spain in the New World: Conquest, Conflict, and Cultural Exchange	
HIST 400	Special Topics ¹	
HIST 434	Urban History	
HIST 471	China through the Ming Dynasty	
HNRS 326V	Art and Mythology	
HNRS 400	Honors Capstone ¹	
MUSC 302	Music History and Literature: Classic through Romantic	
MUSC 421	Music of the Baroque Era	
PHIL 344	Modern Philosophy	
PHIL 363	Independent Studies ¹	
PHIL 463	Independent Studies ¹	
SPAN 306	Special Topics ¹	
Total Credits		18

¹ Courses are approved for the minor only when their topics are appropriate. Students must seek approval to count these courses for the minor from the undergraduate advisor in the Department of English.

Rhetoric and Professional Communication - Undergraduate Minor

Students not earning a bachelor's degree in English with a concentration in Rhetoric, Digital Media, and Professional Communication are eligible to pursue a minor in Rhetoric and Professional Communication. Students must earn 18 credits from the approved course lists below. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a BA in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Rhetoric and Professional Communication.

Prefix	Title	Credits
Requirements		
Select one from the following: ¹		3
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610	American Literature I	
ENGL 2620	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630	British Literature I	
ENGL 2640	British Literature II	
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Select 12 credits from the following:		12
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 315	Writing for the Web	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 326	Cultural Identity and Representation Across the Media	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 460	Proposal Writing	
ENGL 470	Approaches to Composition	
ENGL 478	Document Design	
ENGL 497	Internship	
Total Credits		18

¹ Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

Geography & Environmental Studies Undergraduate Program Information

The Department of Geography and Environmental Studies emphasizes the interaction of humans with the environment, and the program prepares students for professional positions in the public and private sectors, as well as for graduate work. The Department offers two concentrations for the major:

- The Geographic Information Science and Technology (GIS&T) Concentration emphasizes the acquisition of knowledge and skills in geographic information systems and remote sensing tools and concepts;

- The Human-Environment Relationships (HER) Concentration focuses on the analysis and interpretation of the coupled and complex interactions between people and the environment.

As detailed above, the Department of Geography and Environmental Studies also offers minors in Geography and GIS&T. The requirements for teaching fields in earth sciences are listed under the Department of Curriculum and Instruction in the College of Education.

Note: A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.

Graduate Program Information

The Department of Geography and Environmental Studies offers graduate study leading to the Master of Applied Geography degree and to a Doctor of Philosophy in Geography Degree. Our programs focus on the use of geographic perspectives and tools to examine an array of applied research questions related to land-use change, natural resources, biogeography, desertification, landscape conservation, and urban and transportation planning. A minor in Geographic Information Science and Technology (GIS&T) is also available for all graduate students, regardless of major; details are provided above. Admission to the program is in accordance with the general regulations of the Graduate School. Any applicant who does not have an adequate undergraduate background in geography will be required to make up the deficiencies. Doctoral applicants should have a master's degree in Geography or a closely related field. Applicants must submit three letters of recommendation and a formal statement of intent to the Department as part of the application process. Please contact Dr. Michaela Buenemann, Geography and Environmental Studies Graduate Director (elabuen@nmsu.edu) if you have any questions about the program.

The Geography and Environmental Studies Department is also a participant in the Western Regional Graduate Program (WRGP) supported by the Western Interstate Commission of Higher Education (WICHE). The WRGP is a tuition-reciprocity arrangement that enables students that are legal residents in WICHE states (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming) to attend NMSU and pay the resident tuition rate, instead of the nonresident rate that an out-of-state student would normally pay.

The Department of Geography and Environmental Studies has a contract research laboratory (Spatial Applications Research Center-SpARC) and a state-of-the-art computer teaching laboratory, both of which support the full suite of ESRI and ENVI geospatial analytical software. In addition, a hand-held spectroradiometer and 2 UAV's provide precise data collection at varying electromagnetic and spatial resolutions. The SpARC laboratory employs graduate students who work with local and state governments and research agencies, as well as with businesses on applied geography projects. Our teaching laboratory includes 18 workstations to support graduate students engaged in course work and research projects. The Department has good working relationships with the Water Resources Research Institute, the Jornada Experimental Range, the Physical Sciences Laboratory, and other units on campus. The Department of Geography and Environmental Studies has its own field equipment and field vehicle, which graduate students can use to support their thesis research. The potential for financial support exists for graduate students in Geography and Environmental Studies through teaching assistantships and research assistantships. Inquiries regarding the program and assistantships should be directed to Dr. Michaela Buenemann, Geography and Environmental Studies Graduate Director

(elabuen@nmsu.edu). Financial aid questions should be addressed to the Office of Financial Aid at NMSU.

Degrees for the Department

Bachelor Degree(s)

- Geography (Geographic Information Science & Tech) - Bachelor of Science (p. 650)
- Geography (Human/Environment Relationships) - Bachelor of Science (p. 652)

Master Degree(s)

- Geography - Master of Applied Geography (p. 149)

Doctoral Degree(s)

- Geography - Doctor of Philosophy (p. 192)

Minors for the Department

- Geographic Information Systems - Graduate Minor (p. 215)
- Geographic Information Systems - Undergraduate Minor (p. 655)
- Geography - Undergraduate Minor (p. 655)

Associate Professor, Carol Campbell, Department Head

Professors Brown **Associate Professors** Buenemann, Campbell; **Assistant Professors** Dugas, Magrane; **Professor Emeritus** Czerniak, DeMers, Wright

C. P. Brown, Ph.D., (California-Santa Barbara/San Diego State)– geographic information systems, water resources, U.S.-Mexico border environmental issues; M. Buenemann, Ph.D. (Oklahoma)– geographic information science and technology, land change science, drylands; C. L. Campbell, Department Head, Ph.D. (UCLA)– biogeography, landscape ecology, remote sensing, sustainability; D. Dugas, Ph.D. (Oregon)– geomorphology, physical geography; E. Magrane, Ph.D. (U of Arizona)- cultural geography and creativity, human-environment geography, geopoetics, art & environment.

Emeritus Faculty– R. J. Czerniak, Ph.D. (Colorado-Boulder)– land use and transportation planning, Europe, urban geography; M. N. DeMers, Ph.D. (Kansas)– geographic information science, landscape ecology, geographic education; J. B. Wright, Ph.D. (California- Berkeley)– environmental conservation, cultural geography, American West.

Geography Courses

GEOG 1110G. Physical Geography

4 Credits (3+3P)

This course introduces the physical elements of world geography through the study of climate and weather, vegetation, soils, plate tectonics, and the various types of landforms as well as the environmental cycles and the distributions of these components and their significance to humans.

Learning Outcomes

1. Define, describe, illustrate, distinguish among or explain the use of maps, map scale, globes, map projections, and remote sensing.
2. Define, describe, illustrate, distinguish among or explain the various elements of the earth's atmosphere, earth's relation to the sun, incoming solar radiation, the ozone layer, the primary temperature controls, and the unequal heating of land and water.
3. Define, describe, illustrate, distinguish among or explain the weather makers (air temperature, air pressure, humidity, clouds, precipitation, visibility, and wind [including pressure gradient, the Coriolis force, and friction]).
4. Define, describe, illustrate, distinguish among or explain air masses, pressure systems, the various fronts and associated types of storms, weather symbols, monsoons, the various forms of precipitation, along with causes and effects of lightning.
5. Define, describe, illustrate or explain the hydrologic cycle, the characteristics and influences of the oceans and continents on the weather, the Southern Oscillation (i.e., El Nino), the effects of land/water distribution, and climates and their global distribution.
6. Define, describe, illustrate or explain the biosphere, including organisms (flora and fauna), food chains, ecosystems and relationships. Define, describe, illustrate or explain soils in terms of soil-forming processes, components, properties, and classification.
7. Define, describe, illustrate or explain the structure of the earth, the internal processes, weathering and mass wasting, fluvial processes, characteristics and processes of arid regions, processes of coastal and Karst topographical regions, the processes and characteristics of glaciation (mountainous and continental).
8. Define, describe, illustrate, distinguish among or explain specific impacts by humans on weather, climate, and on the ecosystem at large.
9. Perform tests and collect data to analyze and classify weather, climate and landforms characteristics, processes, and impacts both quantitatively and qualitatively. This includes reading and extracting basic information from maps, diagrams, remote sensing devices, graphs, and tables. 1
10. Apply critical thinking skills such as inductive, deductive, and mathematical reasoning to solve problems using the scientific method. This includes interpreting maps, graphs and photos. 1
11. Recognize and discuss the effect of human activity on climate, climate change, the greenhouse effect, and on landforms at large. 1
12. Synthesize information from external, current sources and personal observations and discuss their relationships to class material.

GEOG 1120G. World Regional Geography

3 Credits (3)

Overview of the physical geography, natural resources, cultural landscapes, and current problems of the world's major regions. Students will also examine current events at a variety of geographic scales.

Learning Outcomes

1. Identify, describe, illustrate, distinguish among or explain the basic concepts of geography, the major world regions, areal differences and similarities, the processes that shape geography natural and human, the use of maps, and the key topics of geographical interpretation (e.g., location, world importance, population, political status, resources, etc.).
2. Identify, describe, illustrate, distinguish among or explain the regional groups of Europe, its historical background, its languages and religions, major features, the diversified economy, political structures, and impact on globalization.
3. Identify, describe, illustrate, distinguish among or explain the regional groups of Russia and its satellite nations, its historical background, their languages and religions, major features, their diversified economies, political structures, current problems, and impact on globalization.
4. Identify, describe, illustrate or explain the regional nations of Middle East, their historical background, their languages and religions, the major features, the diversified economies and political structures, the current problems.
5. Identify, describe, illustrate, distinguish among or explain the regional groups of Asia, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
6. Identify, describe, illustrate, distinguish among or explain the regional groups of the Pacific World, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
7. Identify, describe, illustrate, distinguish among or explain the regional groups of Africa, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
8. Identify, describe, illustrate, distinguish among or explain the regional groups of Latin America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
9. Identify, describe, illustrate, distinguish among or explain the regional groups of Anglo-America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization. 1
10. Collect data to analyze or classify the region various historical developments and trends relating to globalization 1
11. Apply critical thinking skills in predicting future developments and impacts in economics, cultural diversity, and political stability globally. 1
12. Recognize and discuss current political "hot-spots," their causes, and potential results with regards to globalization. 1
13. Synthesize information the data into a comprehensive world-view.

GEOG 1130G. Human Geography**3 Credits (3)**

This course serves as an introduction to the study of human geography. Human geography examines the dynamic and often complex relationships that exist between people as members of particular cultural groups and the geographical "spaces" and "places" in which they exist over time and the world today.

Learning Outcomes

1. Locate on maps, globes, and other technologies various geo-political spaces and places around the world, including in the United States.
2. Describe the primary concepts, theories, methods and terms prevalent in the field of human geography.
3. Apply core geographic concepts to the spatial patterns demonstrated in real-world scenarios.
4. Identify the relationships that influence human-environment interaction in a specific location at a specific time.
5. Define and utilize key concepts to explain human social and cultural change over time and across geographical space.
6. Explain the geographic context of a current event or conflict.
7. Identify a current event that illustrates a core cultural geographic concept.
8. Think critically, discuss, and write about the relationships of the natural world to human geography.

GEOG 2130. Map Use and Analysis**3 Credits (2+3P)**

Exploration of the cartographic medium. Development of critical map analysis and interpretation skills, and map literacy. Comprised of traditional lecture, labs, and map use projects.

Learning Outcomes

1. Accurately measure bearings and distances on maps.
2. Read and interpret terrain and landform representation.
3. Utilize a magnetic compass for basic land navigation and basic map making.
4. Utilize a GPS instrument for basic land navigation.
5. Recognize and describe basic physical and cultural spatial patterns portrayed on maps.
6. Analyze and interpret the significance of spatial patterns portrayed on maps.
7. Perform elementary spatial statistical analysis on geographic data.
8. Appreciate and utilize the significance of place names and cultural patterns.
9. Critically examine maps for evidence of information misuse or propagandist motives.
10. Recognize and utilize appropriate map categories, symbols, projections, and coordinate systems to effectively and accurately portray, read, analyze, and interpret geographic data.

GEOG 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

GEOG 315V. World Agriculture and Food Problems**3 Credits (3)**

Survey of food and agricultural issues in the U.S. and other countries. Covers: role of agriculture in economic development; trade in food and agricultural products; global food production, consumption, and marketing patterns; economics of technical change and food assistance; agriculture and the environment. Same as AEEC 315V.

GEOG 325V. New Mexico and the American West**3 Credits (3)**

Examination of the cultural and historical patterns, economic activities, and physical characteristics of New Mexico and the American West. Special focus is given to human, environmental, and cultural landscapes, as well as current issues and challenges in New Mexico, the West, and the border region.

GEOG 326. U.S. National Parks**3 Credits (3)**

Exploration of origins, landscapes, ecosystems, management issues, and conflicts in U.S. National Parks. The regional geography of the United States as seen through the creation and protection of biologically and culturally significant lands.

GEOG 328V. Geography of Latin America**3 Credits (3)**

Explores Latin America from a geographical perspective, integrating environmental, cultural and socioeconomic factors in an in-depth study of the development of the region and contemporary issues and challenges facing the region. Special focus is given to examining applied problems facing Latin America at a range of scales.

GEOG 331V. Europe**3 Credits (3)**

Focus on the cultural continent of Europe. An overview of climate, physical geography, and human geography of Europe, including a brief historical geography of the continent. Current environmental, social, and political issues of Europe will be discussed, with a particular focus on the fate of EU.

GEOG 351. Fundamentals of Biogeography**3 Credits (3)**

Exploration of life in space and time. Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment. Includes an individual research project resulting in a poster presentation. Crosslisted with: GEOG 557.

GEOG 353. Geomorphology**3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 553. Crosslisted with: GEOL 353.

GEOG 357. Climatology**3 Credits (3)**

Elements and controls of climate. Energy and hydrologic cycles, general circulation, climate classification, distribution of climate types, microscale effects, applications.

Learning Outcomes

1. Students will be able to describe the fundamental processes that create climate on Earth.
2. Students will be able to describe the physical laws that comprise the climate system.
3. Students will be able to describe the trends in Earth's climate system.
4. Students will be able to summarize our current knowledge of climate change.

GEOG 361V. Economic Geography**3 Credits (3)**

The geographic relationships of supply and demand resources, population, and transportation. Site analysis and decision-making in different economic systems and cultures and how these decisions affect the environment and the location of economic activities.

GEOG 363V. Cultural Geography**3 Credits (3)**

The world's diverse cultural landscapes. Emphasis on the connections between social, political, religious, and agricultural patterns and the impact of societies on the natural environment.

GEOG 365V. Urban Geography**3 Credits (3)**

The global historical development of urban areas, as well as the changing functions of today's cities. A comparison between the North American city system and cities in Europe, Asia, and South America, including the development of the city form, the internal spatial organization of commercial, residential, and industrial areas, and socio-economic and political factors.

GEOG 373. Introduction to Remote Sensing**4 Credits (3+3P)**

Introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing products. Taught with GEOG 573.

GEOG 381. Cartography and Geographic Information Systems**4 Credits (3+3P)**

Design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 571.

GEOG 401. Internship/Co-op**1-3 Credits (1-3)**

Provides an opportunity whereby students work with a local, regional, or federal agency, or private sector firm on applied geographic work, under the supervision of an agency or firm professional and a geography faculty member. Consent of instructor required.

GEOG 435. Environmental Planning**3 Credits (3)**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 535.

GEOG 441. System Design for Geographic Information Science (GIS)**3 Credits (3)**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted system design methodologies intended to create a successful implementation of GIS inside organizations. Crosslisted with: GEOG 581.

GEOG 452. Landscape Ecology**4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Crosslisted with: GEOG 552.

GEOG 455. Southwest Environments**3 Credits (3)**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 555.

GEOG 467. Transportation Geography**3 Credits (3)**

Nature and distribution of land, air and water transport facilities and their importance in regional development.

Learning Outcomes

1. Develop familiarity with various transportation theories and concepts.
2. Demonstrate accurate use and application of terms and vocabulary used in the transportation field.
3. Understand and demonstrate familiarity with concepts of urban, inter-urban and rural transport systems.
4. Be able to describe and organize bulk and international Multimodal freight patterns and processes.
5. Demonstrate familiarity and application of transportation laws, rules and regulations at the national and international level.

GEOG 473. Advanced Remote Sensing**4 Credits (3+3P)**

Introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. Taught with GEOG 573.

Prerequisite(s): C- or better in GEOG 373.

GEOG 481. Fundamentals of Geographic Information Science (GIS)**4 Credits (3+3P)**

Fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Crosslisted with: GEOG 578.

GEOG 482. Geodatabase Design**3 Credits (2+3P)**

A practical introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally, implementation and documentation. Taught with GEOG 572.

Prerequisite(s): C- or better in GEOG 481.

GEOG 483. Field Explorations in Geography**3 Credits (6P)**

A field-based class where students complete exercises in physical, human, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. Taught with GEOG 583.

GEOG 488. GIS and Water Resources**3 Credits (3)**

Explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student area of interest. Taught with GEOG 588.

GEOG 491. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

GEOG 493. Special Problem Research**1-3 Credits**

For advanced and exceptional students. Research, and preparation of a paper in some phase of geography. A maximum of 6 credits may be earned. Consent of instructor required.

GEOG 495. Directed Readings**1-3 Credits**

Individual study through selected readings. A maximum of 6 credits may be earned. Consent of instructor required.

GEOG 501. Research Design and History of Geographic Thought**3 Credits (3)**

Understanding and application of the research process, including conceptualization and definition of a research problem, study designs, data sources, data collection, and report writing in development of geographic thought.

GEOG 512. Geohumanities Seminar**3 Credits (3)**

In recent years, artists, writers, and humanities scholars have increasingly engaged with geographic concerns, and geographers have incorporated humanities-based approaches to their work. Broadly known as the geohumanities, these interdisciplinary endeavors offer exciting ways to engage with key geographic concepts such as place, landscape, and nature. This graduate level seminar will examine both critical and creative approaches to the geohumanities. Subtitles indicate unique topics. Taught with GEOG 412. May be repeated up to 6 credits.

Learning Outcomes

1. Articulate their own understanding of the geohumanities as an interdisciplinary field, including its practices and its histories that draw on geography's intersection with multiple humanities fields.
2. Identify key texts, thinkers, and practices in the geohumanities, as well as spaces (such as both scholarly and public-facing journals and digital spaces) where geohumanities work is currently being advanced and developed.
3. Analyze, critique, and engage with current debates and directions within the geohumanities.
4. Apply geohumanities approaches within their own work by developing and producing a creative and/or critical project that advances their own research/scholarly/creative interests.

GEOG 535. Environmental Planning**3 Credits (3)**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 435.

GEOG 552. Landscape Ecology**4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Taught with GEOG 452.

GEOG 553. Geomorphology**3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 353.

GEOG 555. Southwest Environments**3 Credits (3)**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 455.

GEOG 557. Fundamentals of Biogeography**3 Credits (3)**

Exploration of life in space and time. Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment. Includes an individual research project resulting in a poster presentation. Additional work for graduate students. Crosslisted with: GEOG 351.

GEOG 571. Cartography and Geographic Information Systems**4 Credits (3+3P)**

Graduate level design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 381.

GEOG 572. Geodatabase Design**3 Credits (2+3P)**

Graduate level introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally implementation and documentation. Taught with GEOG 482.

GEOG 573. Introduction to Remote Sensing**4 Credits (3+3P)**

Graduate level introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing product. Taught with GEOG 373.

GEOG 578. Fundamentals of Geographic Information Science (GIS)**4 Credits (3+3P)**

Graduate level fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Additional work for graduate students. Crosslisted with: GEOG 481.

GEOG 581. System Design for Geographic Information Science (GIS)**3 Credits (3)**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted planning methodologies designed to create a successful implementation of GIS inside organizations. Taught with GEOG 441.

GEOG 582. Advanced Remote Sensing**4 Credits (3+3P)**

Graduate level introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. May be repeated up to 4 credits.

GEOG 583. Field Explorations in Geography**3 Credits (6P)**

A graduate level field-based class where students complete exercises in physical, cultural, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. May be repeated up to 3 credits.

GEOG 585. Advanced Spatial Analysis**3 Credits (3+2P)**

Introduction to basic spatial and aspatial descriptive statistics, statistical analysis of point and area patterns, critical review of quantitative research in geography, and exploration of advanced spatial analysis routines including cluster analysis, hot/cold spot analysis, and spatially weighted regression.

Prerequisite(s): Knowledge of basic statistics recommended.

GEOG 588. GIS and Water Resources**3 Credits (3)**

This is a graduate level class that explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student's area of interest. Taught with GEOG 488.

GEOG 595. Directed Readings**1-3 Credits**

Advanced individual study through selected readings. May be repeated for a maximum of 6 credits.

GEOG 596. Residency**1-12 Credits (1-12)**

A contractual learning experience in the public or private sector under the supervision of a field supervisor and two faculty members. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: Geography majors.

GEOG 598. Selected Topics**1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected geographic themes. May be repeated for unlimited credit.

GEOG 599. Master's Thesis**1-12 Credits (1-12)**

Supervised individual study of a student's thesis topic. May be repeated for an unlimited number of credits. Thesis/Dissertation Grading.

GEOG 601. Introduction to Geographic Theory & Application**3 Credits (3)**

This course is intended to introduce Ph.D. and Masters level students to the history, theory, methods, and contemporary literature of Geography as a discipline. It also serves to prepare incoming students to engage in an integrative, theoretically informed and applied research project. Crosslisted with: GEOG 501.

Learning Outcomes

1. Students will be able to demonstrate a clear understanding of multiple themes and topics in Geography.
2. Students will be able to demonstrate a clear understanding of multiple methods suitable for geographic research
3. Students will be able to identify and summarize recent scholarship relevant to the student's own research interests.
4. Students will be able to communicate clearly and effectively in an oral format.
5. Students will be able to communicate clearly and effectively in a written format.
6. Students will be able to identify a committee chairperson who will guide her or his graduate work.
7. Students will be able to design an integrative program of studies for the remainder of her or his graduate work.

GEOG 602. Integrative Research Design**3 Credits (3)**

This seminar focuses on the basic elements of research design, guiding students through the development of a formal proposal for original academic research. This course should be taken after GEOG 601 as part of the required course sequence for PhD students in Geography.

Prerequisite: GEOG 601.

GEOG 603. Professional Geographic Practice
3 Credits (3)

This core course focuses on a variety of professional development topics that prepare students for teaching and applied community engagement projects. All students in this course will receive training in professional communication, professional ethics, and grant proposal writing. Depending on their individual professional goals, the course will allow students to undertake practical training in a variety of areas that range from academic teaching to applied policy work to scientific communication. All students in the joint doctoral program are expected to engage in applied projects as part of their research design, and this course will lay the foundation for these pursuits. Unlike GEOG 601 and GEOG 602, the final core course will be taught independently on each campus, to maximize the potential for faculty-student interaction on specific location-based project planning. This course will be offered every fall semester.

Prerequisite: GEOG 602.

Learning Outcomes

- 1. Identify professional geography as it relates to project management.
- 2. Explore professional communication in various settings in a variety of workplace settings.

GEOG 700. Doctoral Dissertation
1-18 Credits (1-18)

This highly individualized independent study course is for students who have completed their comprehensive exams and are currently working on their doctoral dissertation. May be repeated up to 18 credits. Thesis/Dissertation Grading.

Learning Outcomes

- 1. Expand their knowledge in a specific area of interest in the discipline of geography.
- 2. Develop their skills in analyzing, synthesizing, and interpreting geographic data and information.
- 3. Develop their skills in technical and/or professional writing.
- 4. Develop their skills in the management and completion of a professional research project.

Name: Geography and Environmental Studies Office

Office Location: Breland Hall rm 137

Phone: (575) 646-3509

Website: <http://geography.nmsu.edu>

Geography (Geographic Information Science & Tech) - Bachelor of Science

The Geographic Information Science and Technology (GIS&T) Concentration offers a solid foundation in geographic thought and human and physical geography, and provides students with advanced knowledge and skills in spatial analysis and modeling through the use of geographic information systems and remote sensing tools and concepts. Preparation for advanced studies is also provided.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1430G	Applications of Calculus I ¹	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
GEOG 1110G	Physical Geography (Departmental Requirement)	
GEOG 1120G	World Regional Geography (Departmental Requirement)	
or GEOG 1130G	Human Geography	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1350G	Introduction to Statistics	3
Viewing a Wider World ⁴		6
Departmental/College Requirements		
GEOG 2130	Map Use and Analysis	3
GEOG 373	Introduction to Remote Sensing	4
GEOG 381	Cartography and Geographic Information Systems	4
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
GEOG 482	Geodatabase Design	3
<i>GIS & T Area Courses</i>		
GEOG 441	System Design for Geographic Information Science (GIS)	3
GEOG 473	Advanced Remote Sensing	4
<i>Human Geography and Physical Geography Courses</i> ⁵		9
<i>Physical Geography (PG)</i>		
GEOG 351	Fundamentals of Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Climatology	
GEOG 452	Landscape Ecology	
<i>Human Geography (HG)</i> ⁶		
GEOG 361V	Challenges of Globalization	
GEOG 363V	Cultural Geography	
GEOG 365V	The City	
GEOG 467	Transportation Geography	
<i>Human Environment Geography (HEG)</i> ⁶		3
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	

GEOG 328V	Environments of Latin America	
GEOG 331V	Europe	
GEOG 483	Field Explorations in Geography	
Second Language Requirement: (required - see below)		6-8
Electives, to bring the total credits to 120 ⁷		35-39
9 credits must be upper-division		
Total Credits		120

¹ MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G or MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ A ST 311 Statistical Applications is also an acceptable course to meet the departments Statistics course requirement, however it will not satisfy the General Education (GE) Elective requirement. If a student takes A ST 311 Statistical Applications, they will need to take an additional General Education course to complete the GE Elective requirement.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Select either one Physical Geography (PG) class and two Human Geography (HG) classes, OR two Physical Geography (PG) classes and one Human Geography (HG) class.

⁶ Courses that have the "V" distinction and are a Human Geography or Human-Environment Geography course will not count towards both the Viewing a Wider World and Human Geography or Human-Environment Geography requirements.

⁷ Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Geography with a Concentration in GIS&T there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8

PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete 6 additional upper-division Geography courses (beyond major requirements)		6

Option 3:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 4:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4
<i>OR</i>		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3

Option 5:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 6:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 7:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 8:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 9:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English.

It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G	Composition I (C- or better)	4
Area VI: Creative and Fine Arts Course ¹		3
Elective Course(s) in FYEX 1112 ²		7
GEOG 1110G	Physical Geography (C- or better)	4
MATH 1430G or MATH 1250G	Applications of Calculus I ³ or Trigonometry & Pre-Calculus	3-4
Area V: Humanities Course ¹		3
GEOG 1120G or GEOG 1130G	World Regional Geography (C- or better in either) or Human Geography	3
GEOG 2130	Map Use and Analysis (C- or better)	3
		Credits 30-31
Second Year		
ENGL 2210G	Professional & Technical Communication (C- or better)	3
Area III: Laboratory Science or Area IV: Social/Behavioral Science Course ¹		3-4
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better)	
A ST 311	Statistical Applications (C- or better)	
Second Language: either 1110-level or Upper Division GEOG course (C- or better) ⁴		3-4
GEOG 381	Cartography and Geographic Information Systems (C- or better)	4
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Second Language: either 1120-level or Upper Division GEOG course (C- or better) ⁴		3-4
GEOG 481	Fundamentals of Geographic Information Science (GIS) (C- or better)	4
Elective Courses(s) ²		6
		Credits 32-35
Third Year		
VWW- Viewing a Wider World Course ⁵		6
Select either a Human Geography or Physical Geography Course (C- or better) ^{6,7}		3
GEOG 373	Introduction to Remote Sensing (C- or better)	4
Select either a Human Geography or Physical Geography Course (C- or better) ^{6,7}		3-4
Choose one from the following Human Environment Geography Courses: ⁷		3
GEOG 325V	New Mexico and the American West (C- or better)	
GEOG 326	U.S. National Parks (C- or better)	
GEOG 328V	Environments of Latin America (C- or better)	
GEOG 331V	Europe (C- or better)	
GEOG 483	Field Explorations in Geography (C- or better)	
Choose one from the following GIS&T Area Courses:		3-4
GEOG 441	System Design for Geographic Information Science (GIS) (C- or better)	
GEOG 473	Advanced Remote Sensing (C- or better)	

Elective Course(s) ²		9
Credits		31-33
Fourth Year		
Select either a Human Geography or Physical Geography Course (C- or better) ^{6,7}		3-4
Choose one from the following GIS&T Area Courses:		3-4
GEOG 441	System Design for Geographic Information Science (GIS) (C- or better)	
GEOG 473	Advanced Remote Sensing (C- or better)	
Elective Course - Upper Division ²		6
GEOG 482	Geodatabase Design (C- or better)	3
Elective Course(s) ²		12
GEOG 488	GIS and Water Resources (optional)	
Credits		27-29
Total Credits		120-128

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses
- ² Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ³ Math Placement: MATH 1220G College Algebra or MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into one of these courses.
- ⁴ Students should take courses to either complete the two semester Second Language Requirements with either Option 1 or Option 2 (see the requirements tab (p. 650) for this degree, the Second Language section)
- ⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁶ Students must have 9 credits total between Human Geography and Physical Geography courses. The requirement must be completed with either two Human Geography and one Physical Geography course(s) OR with one Human Geography and two Physical Geography course(s). *students cannot take all nine credits in one area.
Human Geography Courses: GEOG 361V Challenges of Globalization, GEOG 363V Cultural Geography, GEOG 365V The City, GEOG 467 Transportation Geography
Physical Geography Courses: GEOG 351 Fundamentals of Biogeography, GEOG 353 Geomorphology, GEOG 357 Climatology, GEOG 452 Landscape Ecology
- ⁷ Courses that have the "V" distinction and are a Human Geography or Human-Environment Geography course will not count towards both the Viewing a Wider World and Human Geography or Human-Environment Geography requirements.

Geography (Human/Environment Relationships) - Bachelor of Science

The Human Environment Relationships Concentration offers a solid foundation in geographic thought and geospatial analysis and provides students with advanced knowledge and skills for assessing human and environmental systems and the coupled and complex interactions

between people and the environment. Preparation for advanced graduate studies is also provided.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. *Note: A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.*

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
English Composition - Level 1		
ENGL 1110G	Composition I	4
English Composition - Level 2		
ENGL 2210G	Professional & Technical Communication	3
Oral Communication		
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
GEOG 1110G	Physical Geography (Departmental Requirement)	4
GEOG 1120G	World Regional Geography (Departmental Requirement)	3
GEOG 1130G	Human Geography (Departmental Requirement)	3
<i>Area V: Humanities ²</i>		
<i>Area VI: Creative and Fine Arts ²</i>		
<i>General Education Elective</i>		
MATH 1350G	Introduction to Statistics	3
Viewing a Wider World ⁴		
Departmental/College Requirements		
GEOG 2130	Map Use and Analysis	3
GEOG 381	Cartography and Geographic Information Systems	4
<i>Human Geography (HG) ⁵</i>		
GEOG 361V	Challenges of Globalization	
GEOG 363V	Cultural Geography	
GEOG 365V	The City	
GEOG 467	Transportation Geography	
<i>Human-Environment Geography (HEG) ⁵</i>		
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Environments of Latin America	
GEOG 331V	Europe	
GEOG 483	Field Explorations in Geography	
<i>Physical Geography (PG) ⁵</i>		
GEOG 351	Fundamentals of Biogeography	6-7
GEOG 353	Geomorphology	
GEOG 357	Climatology	

GEOG 452	Landscape Ecology	
<i>Additional HG, HEG, & PG Course ⁵</i>		6
Select 2 additional courses from either the Human Geography, Human Environment Geography or Physical Geography Courses above		
Second Language Requirement: (required - see below)		6-8
Electives, to bring the total credits to 120 ⁶		42-45
15 credits must be Upper Division		
Total Credits		120

- ¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
- ² See the General Education (p. 220) section of the catalog for a full list of courses.
- ³ A ST 311 Statistical Applications is also an acceptable course to meet the departments Statistics course requirement, however it will not satisfy the General Education (GE) Elective requirement. If a student takes A ST 311 Statistical Applications, they will need to take an additional General Education course to complete the GE Elective requirement.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁵ For all Human Geography, Human Environment Geography and Physical Geography course requirements, students cannot repeat the courses multiple times to fulfill the requirement. Courses that have the "V" distinction and are a Human-Environment Geography and Human Geography courses will not count towards both the Viewing a Wider World and Human-Environment Geography and Human Geography requirements.
- ⁶ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Geography with a Concentration in Human Environment Relationships there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6

<i>For Heritage Speakers:</i>		
SPAN 1210	Elementary Spanish for Heritage Learners I	3-6
& SPAN 1220	and Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete 6 additional upper-division Geography courses (beyond major requirements)		6

Option 3:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 4:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 5:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 6:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 7:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 8:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 9:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G	Composition I (C- or better)	4
Area V: Humanities Course ¹		3
GEOG 1110G	Physical Geography (C- or better)	4
Elective Course(s) or FYEX 1112 ²		7
MATH 1220G	College Algebra (C- or better) ³	3
Area VI: Creative and Fine Arts Course ¹		3
GEOG 1120G	World Regional Geography (C- or better)	3
GEOG 1130G	Human Geography (C- or better)	3
Credits		30

Second Year		
ENGL 2210G	Professional & Technical Communication (C- or better)	3
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (Recommended Gen. Ed & C- or better)	4
A ST 311	Statistical Applications (C- or better)	
GEOG 2130	Map Use and Analysis (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	3-4
Second Language: either 1110-level or Upper Division GEOG course (C- or better) ⁵		
Choose one from the following Human Geography Courses: ⁶		3
GEOG 361V	Challenges of Globalization (C- or better)	4
GEOG 363V	Cultural Geography (C- or better)	
GEOG 365V	The City (C- or better)	
GEOG 381	Cartography and Geographic Information Systems (C- or better)	4
Elective Course ²		9
Credits		31-32

Third Year			
VWW - Viewing a Wider World Course(s) ⁷			6
Second Language: either 1120-level or Upper Division GEOG course (C- or better) ⁵			3-4
Choose one from the following Human Environment Geography Courses: ^{8,9}			3
GEOG 325V	New Mexico and the American West (C- or better)		
GEOG 326	U.S. National Parks (C- or better)		
GEOG 328V	Environments of Latin America (C- or better)		
GEOG 331V	Europe (C- or better)		
GEOG 483	Field Explorations in Geography (C- or better)		
Choose one from the following Human Geography Courses: ^{8,9}			3
GEOG 361V	Challenges of Globalization (C- or better)		
GEOG 363V	Cultural Geography (C- or better)		
GEOG 365V	The City (C- or better)		
Choose one from the following Human Environment Geography Courses: ^{8,9}			3
GEOG 325V	New Mexico and the American West (C- or better)		
GEOG 326	U.S. National Parks (C- or better)		
GEOG 328V	Environments of Latin America (C- or better)		

GEOG 331V	Europe (C- or better)	
GEOG 483	Field Explorations in Geography (C- or better)	
Choose one from the following Physical Geography Courses: ⁹		3-4
GEOG 351	Fundamentals of Biogeography (C- or better)	
GEOG 353	Geomorphology (C- or better)	
GEOG 357	Climatology (C- or better)	
GEOG 452	Landscape Ecology (C- or better)	
Elective Course(s) ²		9
Credits		30-32
Fourth Year		
Choose one from the following Physical Geography Courses: ⁹		3-4
GEOG 351	Fundamentals of Biogeography (C- or better)	
GEOG 353	Geomorphology (C- or better)	
GEOG 357	Climatology (C- or better)	
GEOG 452	Landscape Ecology (C- or better)	
Choose two courses from the following areas:		6
Human Geography ^{6,8}		
Human Environment Geography ^{6,8}		
Physical eography ⁹		
Elective Course(s) - Upper Division ²		15
Elective Courses(s) ²		5
GEOG GIS&T Area Course (Optional) ⁷		
Credits		29-30
Total Credits		120-124

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses.
- ² Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ³ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
- ⁴ A ST 311 Statistical Applications is also an acceptable course to meet the departments Statistics course requirement, however it will not satisfy the General Education (GE) Elective requirement. If a student takes A ST 311 Statistical Applications, they will need to take an additional General Education course to complete the GE Elective requirement.
- ⁵ Students should take courses to either complete the two semester Second Language Requirements with either Option 1 or Option 2 (see the requirements tab (p. 650) for this degree, the Second Language section)
- ⁶ **Human Geography:** GEOG 361V Challenges of Globalization, GEOG 363V Cultural Geography, GEOG 365V The City, GEOG 467 Transportation Geography
Human Environment Geography: GEOG 325V New Mexico and the American West, GEOG 326 U.S. National Parks, GEOG 328V Environments of Latin America, GEOG 331V Europe, GEOG 483 Field Explorations in Geography
Physical Geography: GEOG 351 Fundamentals of Biogeography, GEOG 353 Geomorphology, GEOG 357 Climatology, GEOG 452 Landscape Ecology
- ⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

- ⁸ Courses that have the "V" distinction and are a Human-Environment Geography and Human Geography courses will not count towards both the Viewing a Wider World and Human-Environment Geography and Human Geography requirements.
- ⁹ For all Human Geography, Human Environment Geography and Physical Geography course requirements, students cannot repeat the courses multiple times to fulfill the requirement.
- ¹⁰ **GEOG GIS&T Area Course:**
- GEOG 373 Introduction to Remote Sensing
 - GEOG 441 System Design for Geographic Information Science (GIS)
 - GEOG 481 Fundamentals of Geographic Information Science (GIS)
 - GEOG 488 GIS and Water Resources

Geographic Information Systems - Undergraduate Minor

The Department of Geography at NMSU offers a minor in Geographic Information Science and Technology (GIS&T) to interested undergraduate students (non-geography majors). The minor in GIS&T requires 21-22 credits.

Note: A grade of C- or better is required for all courses taken for the minor. Students may not take any of these courses S/U.

The Department of Geography at New Mexico State University offers a minor in Geographic Information Science and Technology (GIS&T) to interested undergraduate students (non-geography majors). To earn a minor in GIS&T, the following courses are required. *Note: A grade of C- or better is required for all courses taken for the minor. Students may not take any of these courses S/U.*

To earn a minor in GIS&T, the following courses are required.

Prefix	Title	Credits
Departmental Requirements		
GEOG 373	Introduction to Remote Sensing	4
GEOG 381	Cartography and Geographic Information Systems	4
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
GEOG 482	Geodatabase Design	3
Select 6-7 credits from the following:		6-7
GEOG 441	System Design for Geographic Information Science (GIS)	
GEOG 473	Advanced Remote Sensing	
GEOG 488	GIS and Water Resources	
Total Credits		21-22

Geography - Undergraduate Minor

The Department of Geography & Environmental Studies offers a minor in Geography to interested undergraduate students from departments outside of Geography & Environmental Studies. To earn a minor in Geography, the following courses are required. *Note: A grade of C- or better is required for all courses taken for the minor. Students may not take any of these courses S/U.*

Prefix	Title	Credits
Departmental Requirements		
GEOG 1110G	Physical Geography	4
GEOG 1120G	World Regional Geography	3
or GEOG 1130G	Human Geography	
Select 3-4 credits from the following:		3-4
GEOG 2130	Map Use and Analysis	
GEOG 381	Cartography and Geographic Information Systems	
GEOG 481	Fundamentals of Geographic Information Science (GIS)	
<i>Physical Geography (PG)</i>		
Select one from the following:		3-4
GEOG 351	Fundamentals of Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Climatology	
GEOG 452	Landscape Ecology	
<i>Human Geography (HG)</i>		
Select one from the following:		3
GEOG 361V	Challenges of Globalization	
GEOG 363V	Cultural Geography	
GEOG 365V	The City	
GEOG 467	Transportation Geography	
<i>Human-Environment Geography (HEG)</i>		
Select one from the following:		3
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Environments of Latin America	
GEOG 331V	Europe	
GEOG 483	Field Explorations in Geography	
Total Credits		19-21

Geological Sciences

Undergraduate Program Information

A degree in geology leads to a wide variety of career choices. Students can access careers in the geosciences through one of three concentrations in the BS Geology degree. The first concentration is Geological Sciences. This is a traditional geology curriculum, in which students take geology classes, augmented with calculus, physics, and chemistry; this concentration leads to graduate study in the geosciences and careers in industry, academia, government, and policy. The second concentration is Earth and Environmental Systems. Students take geology classes, augmented with a variety of environmental, economic, and political classes; this concentration leads to careers in the environmental industry. The third concentration is Earth Science Education. Students take geology and education classes, and are certified to teach science at New Mexico middle and high schools after completing the BS and one year of graduate work in the College of Education.

Students earning the BS in Geology, any concentration, may also earn the Undergraduate Research Certificate in the Department of Geological Sciences. Completion of the Undergraduate Research Certificate includes completion of an undergraduate research project, participation in the department's undergraduate research meetings and one of the following:

1. a senior thesis;
2. a manuscript submitted for a publication; or
3. an oral or poster presentation at a national or regional meeting.

Undergraduate Research Certificates are presented at the department's annual awards ceremony.

The Department of Geological Sciences also cooperates with the Department of Physics in offering a BS degree in physics with a concentration in geophysics. Requirements are listed in the Department of Physics (p. 822) section of this catalog.

Graduate Program Information

The Department of Geological Sciences offers graduate study leading to the Master of Science degree in geology. The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, geochronology, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory, plus computer, geochemical and petrographic labs. Major equipment includes a Gemini heavy mineral separation table, a class 1000 clean lab, Thermal Ionization Mass Spectrometry (TIMS) and Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LA-MC-ICP-MS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor. Admission to the program is in accord with the general regulations of the Graduate School.

Degrees for the Department Bachelor Degree(s)

- Geology (Earth and Environmental Sciences) - Bachelor of Science (p. 660)
- Geology (Earth Science Education) - Bachelor of Science (p. 663)
- Geology (Geological Sciences) - Bachelor of Science (p. 666)

Master Degree(s)

- Geology - Master of Science (p. 149)

Minors for the Department

- Geology - Undergraduate Minor (p. 669)

Professor, Nancy J. McMillan, Department Head

Professors Amato, McMillan, Ramos; **Associate Professor** Burgette, Hampton; **Adjunct Professors** G. Brown, K. Davis, J. Witcher; **Emeritus Faculty** Lawton, Mack

N. J. McMillan, Department Head, Ph.D. (Southern Methodist)– igneous petrology, geochemistry; J. M. Amato, Ph.D. (Stanford)– structural geology, tectonics; F. C. Ramos, Ph.D. (California- Los Angeles)– isotope geochemistry, petrology; R. J. Burgette, Ph.D. (Oregon)- neotectonics; B.A. Hampton, Ph.D. (Purdue)- sedimentology, tectonics; T.F. Lawton, Ph.D. (Emeritus) (Arizona)- stratigraphy, basin analysis; G.H. Mack, Ph.D. (Emeritus) (Indiana-Bloomington)- sedimentary petrology, sedimentology.

Geology Courses

GEOL 1110G. Physical Geology

4 Credits (3+3P)

Physical Geology is an introduction to our dynamic Earth introducing students to the materials that make up Earth (rocks and minerals) and the processes that create and modify the features of our planet. The course will help students learn how mountains are formed, how volcanoes erupt, where earthquakes occur, and how water, wind, and ice can shape landscapes. Students will also develop a basic understanding of the ways humans have altered the planet including our impact on natural resources and global climate change.

Learning Outcomes

1. Recall, describe or explain geologic vocabulary.
2. Identify or explain aspects of the geologic time scale and compare the uses and limitations of relative and absolute dating.
3. Recognize or explain the evidence used to support the theory of plate tectonics. Describe or identify how plate tectonics is related to the structure and features of the Earth.
4. Describe the formation of, and describe, compare, and classify minerals.
5. Identify or describe the three main rock types, how each forms in the context of the rock cycle and what each indicates about its environment of formation.
6. Recognize or explain the fundamentals of surface and groundwater hydrology and discuss the impact of human activities on water quality and quantity.
7. Describe or discuss the processes that are responsible for specific geologic hazards (e.g., earthquakes, volcanic eruptions, mass movement, flooding, etc.).
8. Recognize or describe the geologic processes involved in the formation and concentration of geologic resources.

GEOL 1150. Introduction to Rocks and Minerals

3 Credits (2+3P)

This course is an introduction to the characteristics and the formation of the three main types of rocks, the rock-forming minerals, and important ore minerals. An outline of Plate Tectonics will give students the basis to understand how many of these rocks and minerals form. In laboratory exercises, students will gain practice in describing and identifying hand-specimens of the main types of rocks and minerals.

Prerequisite(s)/Corequisite(s): GEOL 1110G.

Learning Outcomes

1. The student Identify the main rock-forming minerals from each mineral group as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise component. Studying minerals, the student will: Identify the main minerals in hand specimens; Describe the environments in which these minerals form; Identify the rock types in which these minerals are found.
2. The student will understand the structure, composition, and genesis of rocks by identifying the principal igneous, sedimentary, and metamorphic rocks, as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise components.
3. Studying rocks, the student will: Define the principal igneous processes and features, identify the most common igneous rocks and their constituting minerals in hand specimens, and discuss their origin and interpretation; Describe the principles of sedimentary processes and features, identify the most common sedimentary rocks in hand specimens, and discuss their origin and interpretation; Describe the principles of metamorphic processes and features, identify the most common metamorphic rocks and constituting minerals in hand specimens, and discuss their origin and interpretation.

GEOL 2130. Introduction to Meteorology**4 Credits (3+3P)**

Introduction to Earth's atmosphere and the dynamic world of weather as it happens. Working with current meteorological data delivered via the Internet and coordinated with learning investigations keyed to the current weather; and via study of select archives.

Learning Outcomes

1. Recall, describe, or explain the various elements of the Earth's atmosphere, Earth's relation to the sun, incoming solar radiation, the ozone layer, the primary temperature controls, and the unequal heating of land and water.
2. Recall, describe, or explain weather variables and parameters.
3. Recall, describe, or explain air masses, pressure systems, the various fronts and associated types of storms, weather symbols, monsoons, the various forms of precipitation, along with causes and effects of lightning.
4. Recall, describe, or explain the hydrologic cycle, the characteristics and influences of the oceans and continents on the weather, the Southern Oscillation (i.e., El Nino), and the effects of land/water distribution.
5. Recall, describe, or explain specific impacts by humans on weather, climate, and on the ecosystem at large.
6. Evaluate and interpret information from maps, diagrams, remote sensing devices, graphs, and tables.
7. Apply critical thinking skills such as inductive, deductive, and mathematical reasoning to solve problems using the scientific method.
8. Recognize and discuss the effect of human activity on climate, climate change and the greenhouse effect.
9. Synthesize information from external, current sources and personal observations and discuss their relationships to class material.

GEOL 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

GEOL 305V. Fossils and the Evolution of Life**3 Credits (3)**

Examination of the fossil record within the context of geologic time. Special emphasis on critical evaluation of possible terrestrial and extra-terrestrial causes for the evolution of plants and animals and for periods of mass extinction.

GEOL 310. Mineralogy**3 Credits (2+3P)**

Crystallography and the physical and chemical aspects of minerals.

Prerequisite(s): GEOL 1110G and CHEM 1215G.

GEOL 312. Mineralogy and Optics**3 Credits (2+3P)**

Principles of crystallography, optical mineralogy, and mineral chemistry as applied to the identification and characterization of rock-forming minerals. May be repeated up to 3 credits.

Prerequisite(s): GEOL 1110G and GEOL 1150.

Learning Outcomes

1. Students will understand how polarized light interacts with isotropic, uniaxial, and biaxial crystals.
2. Students will be able to recognize optical phenomena resulting from the interaction of polarized light with minerals.
3. Students will become proficient in the recognition of the major rock-forming minerals in thin section.
4. Students will recognize crystal faces according to the Miller Indices.
5. Students will be able to calculate the structural formula of any mineral.

GEOL 320. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

GEOL 335V. Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present**3 Credits (3)**

This class will provide an introduction to geologic hazards and natural disasters, their effects on society and the attempts at preparation and mitigation for these events. Hazards to be covered include earthquakes, volcanic eruptions, floods, landslides, hurricanes, tsunamis and others.

GEOL 353. Geomorphology**3 Credits (2+3P)**

Same as GEOG 353. May be repeated up to 3 credits.

GEOL 360. General Geochemistry**3 Credits (3)**

The chemistry of the earth and its parts, with emphasis on geochemical systems and cycles, distribution of the elements, and mineral equilibria. Crosslisted with: CHEM 360

Prerequisite(s): CHEM 1215G or CHEM 1120G.

GEOL 399. Igneous and Metamorphic Petrology**3 Credits (2+3P)**

Mineralogical composition, classification, and genesis of igneous and metamorphic rocks.

Prerequisite(s): GEOL 312 for geology majors, GEOL 310 for majors other than geology.

GEOL 401. Geology Colloquium**1 Credit (1)**

Presentations by visiting speakers and students. May be repeated up to 6 credits.

GEOL 420. Stratigraphy and Sedimentology**3 Credits (2+3P)**

Identification and interpretation of sedimentary rocks with emphasis on classification, deposition, and stratal geometry.

Prerequisite: GEOL 310.

GEOL 424. Soil Chemistry**3 Credits (3)**

Same as SOIL 424, CHEM 424.

GEOL 441. Tutorial Geology**2 Credits (1+3P)**

Participation in teaching lower-division laboratories and conducting tutorial sessions. May be repeated for a total of 4 credits.

Prerequisite(s): junior or above standing and nomination by faculty.

GEOL 442. Zuhl Collection Internship**1-3 Credits (3-9P)**

Applied experience with the NMSU Zuhl Collection, under supervision of the Zuhl Collection Director. Possible activities include developing displays, giving tours, developing outreach materials, etc. May be repeated up to 6 credits. Consent of Instructor required.

GEOL 444. GIS for Geology**3 Credits (3)**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOG 544.

Prerequisite(s): GEOL 470.

GEOL 449. The Geological Profession**1 Credit (1)**

Outcomes assessment exit exams. For graduating seniors only. May be repeated up to 1 credits.

Prerequisite(s): Graduating seniors only.

GEOL 452. Geohydrology**4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits. Crosslisted with: ENVS 452 and C E 452.

GEOL 455. Undergraduate Research**1-3 Credits**

Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

GEOL 465. Isotope Geochemistry**3 Credits (3)**

Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences.

Prerequisite(s): CHEM 1225G, GEOL 360, GEOL 399.

GEOL 470. Structural Geology**3 Credits (2+3P)**

Deformation of rocks of the earth. Prerequisite: GEOL 310

GEOL 471. Volcanology**3 Credits (3)**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruption dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 571.

Prerequisite(s): GEOL 399.

GEOL 477. Special Problems**1-3 Credits**

Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits.

Prerequisite: consent of instructor.

GEOL 478. Petroleum Systems and Stratigraphy**3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments, and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips. May be repeated up to 3 credits.

Prerequisite(s): GEOL 420.

GEOL 480. Seminar**1-3 Credits**

Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

GEOL 482. Zuhl Collection Internship**1-3 Credits (1-3)**

Applied experience working with the Zuhl Collection of rocks, minerals, fossils, and petrified wood, supervised by the Director of the Zuhl Collection. Activities include tours, display development, research on aspects of the collection, and other work in the museum. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: GEOL majors.

GEOL 490. Field Geology**3 Credits (9P)**

Mapping, instrumentation, and interpretation of geology in the field.

Prerequisites: either GEOL 420 and GEOL 470.

GEOL 491. Tectonic Evolution of North America**3 Credits (3)**

Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development.

Prerequisites: GEOL 1110G, GEOL 399, GEOL 420 and GEOL 470.

GEOL 495. Geology Field Camp**4 Credits (12P)**

Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490

GEOL 499. Senior Thesis**1-3 Credits**

Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Restricted to majors.

Prerequisite: consent of instructor.

GEOL 501. Geology Colloquium**1 Credit (1)**

Presentations by visiting speakers and graduate students.

GEOL 520. Selected Topics**1-3 Credits (1-3)**

Selected topics in geology. Students must be in graduate standing to enroll. Consent of instructor required. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GEOL 534. Tectonics of Sedimentary Basins**3 Credits (3)**

Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Restricted to: GEOL majors May be repeated up to 3 credits. Prerequisite: .

Learning Outcomes

1. To be able to recognize sedimentary basin types in geologic and geomorphic environments.
2. To understand these aspects of sedimentary basins: plate tectonic setting/context, basement to basins (continental vs. oceanic/transitional lithosphere), structure and structural vergence, sedimentologic and stratigraphic signatures in the rock record, depositional systems, and basin-scale provenance.

GEOL 537. Topics in Volcanology**3 Credits (3)**

A seminar-style class exploring volcanic processes. Course topics vary by semester and include: magmatism and volcanism at different tectonic settings (subduction zones, intraplate) and plumbing systems and eruptions of volcanoes (calderas, monogenetic volcanoes).

GEOL 544. GIS for Geology**3 Credits (3)**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Taught with: GEOL 444. May be repeated up to 3 credits.

Learning Outcomes

1. A tools-based introduction to Geographic Information Systems software, specifically the ArcGIS package developed by ESRI.
2. Hands-on use of GIS software to make maps and analyze datasets that are commonly used by geoscientists.
3. Compiling and analyzing geologic mapping datasets collected from the field and from published literature.
4. Development of an awareness of how to find publicly accessible datasets and solutions to problems beyond the sample exercises presented in class.
5. Application of GIS to solve a problem.

GEOL 558. Neotectonics**3 Credits (3)**

Recognition, measurement, and dating of deformation related to earthquakes in the Quaternary geologic record.

GEOL 562. Analytical Geochemistry**3 Credits (3)**

Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.

GEOL 565. Isotope Geochemistry**3 Credits (3)**

Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.

GEOL 571. Volcanology**3 Credits (3)**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruptions dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 471.

GEOL 578. Petroleum Systems and Stratigraphy**3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips.

GEOL 582. Plate Tectonics**3 Credits (3)**

Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.

GEOL 585. Geochronology**3 Credits (3)**

The principles, analytical methods, and interpretation of the most common geochronologic methods.

GEOL 598. Special Research Programs**1-3 Credits**

Investigations into contemporary geological problems. May be repeated for unlimited credit.

Prerequisites: graduate standing and consent of instructor.

GEOL 599. Master's Thesis**15 Credits**

Thesis research.

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Geology (Earth and Environmental Sciences) - Bachelor of Science

The concentration in geological sciences provides students with scientific insight as a foundation for careers in environmental earth science, environmental policy and resource management. Qualified students are also prepared for graduate study in these areas. This concentration does not prepare students for graduate study in the geological sciences; these students should follow the curriculum in the Geological Sciences Concentration.

Students must complete all University degree requirements, which include: **General Education requirements**, **Viewing a Wider World requirements**, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
MATH 1220G	College Algebra (or higher)	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
ECON 2120G	Principles of Microeconomics	
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Viewing A Wider World ³		6
Departmental/College Requirements ⁴		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GEOL 353	Geomorphology	3
GEOL 360	General Geochemistry	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
GEOL 452	Geohydrology	4
GEOL 470	Structural Geology	3
Departmental Elective Requirements (select 9 credits from the following) ⁴		9
GEOL 312	Mineralogy and Optics	
GEOL 399	Igneous and Metamorphic Petrology	
GEOL 465	Isotope Geochemistry	
GEOL 478	Petroleum Systems and Stratigraphy	
GEOL 480	Seminar	
GEOL 490	Field Geology	
GEOL 491	Tectonic Evolution of North America	
GEOL 495	Geology Field Camp	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁴		
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
AEEC 337V or AEEC 384V	Natural Resource Economics Water Resource Economics	3
GEOG 381	Cartography and Geographic Information Systems	4
PHYS 1230G or PHYS 2230G	Algebra-Based Physics I General Physics for Life Science I	3
PHYS 1230L	Algebra-Based Physics I Lab	1

or PHYS 2230L	Laboratory to General Physics for Life Science I	
Second Language Requirement: (required- see below)		
Select 8 credits from two semesters of a second language (see the section at the bottom of the page)		8
Non-Departmental Electives (choose 12-14 credits from the following) ⁴		12-14
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
SOIL 370	Environmental Soil Science	
CHEM 1225G or CHEM 2115	General Chemistry II Lecture and Laboratory for STEM Majors Survey of Organic Chemistry and Laboratory	
POLS 320	Making Public Policy	
GEOG 373	Introduction to Remote Sensing	
GEOG 473	Advanced Remote Sensing	
EPWS 380V	Science & Society	
RGSC 2110	Introduction to Rangeland Management	
RGSC 302V	Forestry and Society	
GEOL courses: 300-400 level GEOL courses other than those used to satisfy the departmental requirements and electives		
Electives, to bring the total credits to 120 ⁵		8-11
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² For any Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ May not be taken S/U and a grade of C- or better must be earned.

⁵ Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	8
FREN 1110 & FREN 1120	French I and French II	8

GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4
<i>OR</i>		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I and MATH 1220G College Algebra. The contents and order of this roadmap may vary depending on initial student placement in

mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
GEOL 1110G or HNRS 2116G	Physical Geology or Earth, Time and Life	4
MATH 1220G	College Algebra (or higher)	3
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course ¹		3
Area VI: Creative and Fine Arts Course ¹		3
Credits		16

Semester 2

Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1121	General Supplemental Instruction I (or elective)	1
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
ECON 2120G	Principles of Microeconomics	3
Credits		16

Second Year

Semester 1		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
PHYS 1230G or PHYS 2230G	Algebra-Based Physics I or General Physics for Life Science I	3
PHYS 1230L or PHYS 2230L	Algebra-Based Physics I Lab or Laboratory to General Physics for Life Science I	1
PHYS 2231	Supplemental Instruction to General Physics for Life Sciences I	1
Second Language, first course in sequence ²		4
Credits		15

Semester 2

GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GEOL 420	Stratigraphy and Sedimentology	3
Second language, second course in sequence ²		4
Non-Departmental Elective Course ³		3
Elective Course ⁴		3
Credits		16

Third Year

Semester 1		
GEOL 353	Geomorphology	3

GEOL 360	General Geochemistry	3
Geology Departmental Elective Course ⁵		3
English Composition Level 2 ¹		3
Viewing the Wider World ⁶		3
Credits		15
Semester 2		
Geology Departmental Elective Course ⁵		3
GEOG 381	Cartography and Geographic Information Systems	4
AEEC 337V	Natural Resource Economics	3
or AEEC 384V	or Water Resource Economics	
Non-Departmental Elective Course ³		3
Elective Course ⁴		3
Credits		16
Fourth Year		
Semester 1		
GEOL 470	Structural Geology	3
GEOL 452	Geohydrology	4
A ST 311	Statistical Applications	3
or MATH 1350G	or Introduction to Statistics	
or MATH 2350G	or Statistical Methods	
Viewing the Wider World ⁶		3
Non-Departmental Elective Course ³		3
Credits		16
Semester 2		
GEOL 449	The Geological Profession	1
Geology Departmental Elective course ⁵		3
Non-Departmental Elective Course ³		3
Elective Course ⁴		3
Credits		10
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² See the Second Language section of the Requirements Tab (p. 660) for this degree for more information.

³ **Non-Departmental Elective Courses:**

- SOIL 2110 Introduction to Soil Science/SOIL 2110L Introduction to Soil Science Laboratory
- SOIL 370 Environmental Soil Science
- CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors
- CHEM 2115 Survey of Organic Chemistry and Laboratory
- POLS 320 Making Public Policy
- GEOG 373 Introduction to Remote Sensing
- GEOG 473 Advanced Remote Sensing
- EPWS 380V Science & Society
- RGSC 2110 Introduction to Rangeland Management
- RGSC 302V Forestry and Society
- GEOL courses: 300-400 level courses other than those used to satisfy the Departmental Requirements and Departmental Electives

⁴ Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

⁵ **Departmental Electives:**

- GEOL 312 Mineralogy and Optics
- GEOL 399 Igneous and Metamorphic Petrology
- GEOL 465 Isotope Geochemistry
- GEOL 478 Petroleum Systems and Stratigraphy
- GEOL 480 Seminar
- GEOL 490 Field Geology
- GEOL 491 Tectonic Evolution of North America
- GEOL 495 Geology Field Camp

⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Geology (Earth Science Education) - Bachelor of Science

The concentration in earth science education is a collaboration between the Department of Geological Sciences and the Department of Curriculum and Instruction in the College of Education. In this option, students earn a Secondary Licensure as well as a BS in Geology, and become qualified to teach the Broad Sciences at the middle and high school levels. Students take one year of graduate classes in the College of Education to complete the Secondary Licensure.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ^{1,2}		3
MATH 1220G	College Algebra (or higher)	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
CEPY 1120G	Human Growth and Behavior	
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	4
& BIOL 2610L	and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Viewing A Wider World ³		6
Departmental/College Requirements ⁴		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3

GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
Geology Departmental Electives (choose four of these courses)		12
GEOL 312	Mineralogy and Optics	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 360	General Geochemistry	
GEOL 399	Igneous and Metamorphic Petrology	
GEOL 444	GIS for Geology	
GEOL 470	Structural Geology	
GEOL 491	Tectonic Evolution of North America	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁴		
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
CEPY 2110	Learning in the Classroom	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ⁵	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ⁵	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4410	Teaching Science at the Middle and High School Level	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
PHYS 1230G	Algebra-Based Physics I	3
or PHYS 2230G	General Physics for Life Science I	
PHYS 1230L	Algebra-Based Physics I Lab	1
or PHYS 2230L	Laboratory to General Physics for Life Science I	
PHYS 1240G	Algebra-Based Physics II	3
or PHYS 2240G	General Physics for Life Science II	
PHYS 1240L	Algebra-Based Physics II Lab	1
or PHYS 2240L	Laboratory to General Physics for Life Science II	
SPED 3105	Introduction to Special Education in a Diverse Society	3
READ 4330	Content Area Literacy	3
Second Language Requirement: (required- see below)		
Select 8 credits from two semesters of a second language (see section at the bottom of the page)		8
Electives, to bring the total credits to 120 ⁶		1
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² For any Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ May not be taken S/U and a grade of C- or better must be earned.

⁵ CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors: Preferred

⁶ Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

After completing the BS in Geology, Concentration Earth Science Education, students should apply and be admitted to the Graduate School in the Department of Curriculum and Instruction, and be admitted to the Teacher Education Program (TEP). For additional details, see the School of Teacher Preparation, Administration and Leadership (p. 1203) portion of the NMSU Catalog.

Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	8
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120	Mandarin Chinese II French II German II	4

or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
English Composition - Level 1 Course ¹		4
GEOL 1110G	Physical Geology	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra	3
Elective Course ²		1
Credits		15
Semester 2		
Oral Communication Course ¹		3
CEPY 2110	Learning in the Classroom	3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Area V: Humanities Course ¹		3
Area VI: Creative and Fine Arts course ¹		3
Credits		16

Second Year**Semester 1**

GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
EDUC 3120	Multicultural Education	3
Second Language first course in sequence ³		4
Credits		17

Semester 2

GEOL 420	Stratigraphy and Sedimentology	3
Geology Departmental Elective Course ⁴		3
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language second course in sequence ³		4
Credits		17

Third Year**Semester 1**

Geology Departmental Elective Course ⁴		3
PHYS 1230G or PHYS 2230G	Algebra-Based Physics I or General Physics for Life Science I	3
PHYS 1230L or PHYS 2230L	Algebra-Based Physics I Lab or Laboratory to General Physics for Life Science I	1
Viewing a Wider World course ⁵		3
EDUC 3997	Secondary Field Experience	3
Student who need to enroll in 15 credits for Financial Aid purposes will need to take additional elective credits		
Credits		13

Semester 2

Geology Departmental Elective ⁴		3
PHYS 1240G or PHYS 2240G	Algebra-Based Physics II or General Physics for Life Science II	3
PHYS 1240L or PHYS 2240L	Algebra-Based Physics II Lab or Laboratory to General Physics for Life Science II	1
BIOL 313 or BIOL 322	Structure and Function of Plants or Zoology	3
READ 4330	Content Area Literacy	3
Viewing a Wider World Course ⁵		3
Credits		16

Fourth Year**Semester 1**

Geology Departmental Elective Course ⁴		3
GEOL 449	The Geological Profession	1
ENGL 2210G or ENGL 2210H	Professional & Technical Communication or Professional and Technical Communication Honors	3
ASTR 1120G	The Planets Lecture & Laboratory	4
EDUC 4410	Teaching Science at the Middle and High School Level	3

Student who need to enroll in 15 credits for Financial Aid purposes will need to take additional elective credits

Credits		14
Semester 2		
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
Credits		12
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

³ See the Second Language section of the Requirements Tab (p. 660) for this degree for more information.

⁴ **Departmental Electives:**

- GEOL 312 Mineralogy and Optics
- GEOL 335V Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present
- GEOL 360 General Geochemistry
- GEOL 399 Igneous and Metamorphic Petrology
- GEOL 444 GIS for Geology
- GEOL 470 Structural Geology
- GEOL 491 Tectonic Evolution of North America

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Geology (Geological Sciences) - Bachelor of Science

The concentration in geological sciences is a broad field of study that prepares students for employment by energy and mineral industries, environmental and water resource companies, federal, state and local governments, as well as service companies that utilize earth resources. Qualified students are also prepared for graduate study in the geological sciences.

Students must complete all University degree requirements, which include: **General Education requirements, Viewing a Wider World requirements**, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		

<i>Area II: Mathematics</i>	3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>	11

GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	

<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹	
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<i>Area V: Humanities</i> ¹	3
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<i>Area VI: Creative and Fine Arts</i> ¹	3
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<i>General Education Elective</i>	
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CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
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Viewing A Wider World ³	6
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Departmental/College Requirements ⁴	
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GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 312	Mineralogy and Optics	3
GEOL 360	General Geochemistry	3
GEOL 399	Igneous and Metamorphic Petrology	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
GEOL 470	Structural Geology	3
GEOL 490	Field Geology	3
GEOL 491	Tectonic Evolution of North America	3
GEOL 495	Geology Field Camp	4

<i>Departmental Elective Requirements</i> ⁴	
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Select 12 credits from the following:	12
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C E 357	Soil Mechanics	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 353	Geomorphology	
GEOL 424	Soil Chemistry	
GEOL 444	GIS for Geology	
GEOL 452	Geohydrology	
GEOL 465	Isotope Geochemistry	
GEOL 478	Petroleum Systems and Stratigraphy	
GEOL 480	Seminar	
SOIL 2110	Introduction to Soil Science	

Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁴	
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MATH 1511G	Calculus and Analytic Geometry I	3-4
or MATH 1430G	Applications of Calculus I	
MATH 1521G	Calculus and Analytic Geometry II (Choose one sequence from the following (4 credits):) ²	3-4
or MATH 1440	Applications of Calculus II	

Choose one sequence from the following (4 credits):	4
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PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	

Choose one sequence from the following (4 credits):	4
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PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	

PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Select 3-4 credits from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 158	R Programming I	
C E 151	Introduction to Civil Engineering	
GEOG 381	Cartography and Geographic Information Systems	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Second Language Requirement: (required- see below)		
Select 8 credits from two semesters of a second language (see the section at the bottom of the page)		8
Electives, to bring to the total credits 120 ⁵		7-11
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² *For either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ May not be taken S/U and a grade of C- or better must be earned.

⁵ Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	8
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8

PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120 or FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	Mandarin Chinese II French II German II Japanese II Spanish II	4

OR

Challenge the 1120/1220/2210 level for the following courses:

PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3
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Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1250G Trigonometry & Pre-Calculus and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
Area I: Communications - Level 1 Course		4
ENGL 1110G	Composition I (Recommended) ¹	
Area II: Mathematics Course ¹		3-4
MATH 1250G	Trigonometry & Pre-Calculus (Recommended) ²	
GEOL 1110G	Physical Geology	4
or HNRS 2116G	or Earth, Time and Life	
Area IV: Social and Behavioral Science Course ¹		3
Credits		14-15
Semester 2		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ²	4
MATH 1430G	Applications of Calculus I ²	3-4
or MATH 1511G	or Calculus and Analytic Geometry I	
Area I: Communications - Oral Communication Course		3
COMM 1115G	Introduction to Communication (Recommended)	
Area VI: Creative and Fine Arts Course ¹		3
Elective Course ³		1
Credits		14-15

Second Year

Semester 1		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ²	4
MATH 1440	Applications of Calculus II ²	3-4
or MATH 1521G	or Calculus and Analytic Geometry II	
Area I: Communications - Level 2 Course		3
ENGL 2210G	Professional & Technical Communication (Recommended) ¹	
Credits		16-17
Semester 2		
GEOL 312	Mineralogy and Optics (Spring Only) ²	3
GEOL 420	Stratigraphy and Sedimentology	3
Choose one from the following:		3-4
GEOG 381	Cartography and Geographic Information Systems (Recommended to meet the 3-4 credit non-departmental requirement)	
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 158	R Programming I	
C E 151	Introduction to Civil Engineering	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Area V: Humanities Course ¹		3
Elective Course ³		2
Credits		14-15

Third Year

Semester 1		
GEOL 470	Structural Geology ²	3
GEOL 360	General Geochemistry	3
Choose one sequence from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ²	

PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab ²	
Geology Upper-Division Elective Course (refer to degree requirements list)		3
Elective course		2

Credits **15**

Semester 2		
GEOL 399	Igneous and Metamorphic Petrology	3
Choose one sequence from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ²	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab ²	
Geology Upper-Division Elective Course (refer to degree requirements list)		3
VWW: Viewing a Wider World Course ⁴		3
Elective course		2

Credits **15****Fourth Year**

Summer		
GEOL 495	Geology Field Camp ⁵	4

Credits **4**

Semester 1		
VWW: Viewing a Wider World Course ⁴		3
Geology Upper-Division Elective Course (refer to degree requirements list)		3
Geology Upper-Division Elective Course (refer to degree requirements list)		3
Elective Course		2
First Course in Second Language Series		4

Credits **15**

Semester 2		
GEOL 490	Field Geology ^{1,5}	3
GEOL 491	Tectonic Evolution of North America ¹	3
GEOL 449	The Geological Profession ¹	1
Second Course in Second Language Series		4
Elective course ³		2

Credits **13****Total Credits** **120-124**

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

³ Students whose Financial Aid requires enrollment in at least 15 credits each semester, may need to take additional elective credit than what is listed. Students should discuss their electives with their advisor. *Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ GEOL 495 Geology Field Camp, is only taught in the summer of odd-numbered years. Students should take GEOL 490 Field Geology, during the spring semester before taking GEOL 495.

GEOL 495 Geology Field Camp should be taken the summer after the third or fourth year. In cases where it is impossible to fit this class into a schedule, students may take a field camp at another university and transfer the credits. It is the student's responsibility to have the department head verify that the field camp is acceptable before taking the course.

Geology - Undergraduate Minor

A student cannot earn a BS in Geology and also earn a minor in Geology.

Prefix	Title	Credits
Required Courses		
GEOL 1110G or HNRS 2116G	Physical Geology Earth, Time and Life	4
GEOL 305V	Fossils and the Evolution of Life	3
Select 12 credits from the following:		12
GEOL 310	Mineralogy	
GEOL 312	Mineralogy and Optics ¹	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 353	Geomorphology	
GEOL 360	General Geochemistry	
GEOL 399	Igneous and Metamorphic Petrology ¹	
GEOL 420	Stratigraphy and Sedimentology ¹	
GEOL 444	GIS for Geology	
GEOL 465	Isotope Geochemistry ¹	
GEOL 470	Structural Geology ¹	
GEOL 477	Special Problems (variable credit) ¹	
GEOL 478	Petroleum Systems and Stratigraphy ¹	
GEOL 480	Seminar (variable credit) ¹	
GEOL 490	Field Geology ¹	
GEOL 491	Tectonic Evolution of North America ¹	
GEOL 495	Geology Field Camp ¹	
Total Credits		19

¹ Courses with Geology prerequisites other than GEOL 1110G Physical Geology or HNRS 2116G Earth, Time and Life.

Government

Undergraduate Program Information

The study of government and political science blends the strengths of a liberal arts education while preparing students for a career in their field. Career opportunities can include positions in: federal, state, and local government; public administration and public service; and in public policy analysis.

The government major program calls for a thorough preparation in the study of government as described below with the opportunity for those interested in specific careers to concentrate in one of the subfields:

- American government and politics,
- public law,

- public administration and policy,
- comparative politics,
- political theory and
- international relations.

The department also offers a supplementary major in law and society, which is supportive of law-related careers.

A government minor program involving 18 credits of course work is also offered. A subfield minor or a general minor may be selected. In addition, the department participates in an interdisciplinary minor in Contemporary Social Studies.

Graduate Program Information

The Department of Government offers two degrees:

- the Master of Arts (MA) in government and
- the Master of Public Administration (MPA) and
- a graduate minor in Security Studies.

The programs are designed to prepare students both for diverse careers in the public sector and for further training at the doctoral level. The MPA program is accredited by the Network of Schools of Public Policy, Affairs and Administration (NASPAA), a distinction held by fewer than one-quarter of MPA programs nationwide. The MPA program offers joint degrees

- with the Department of Criminal Justice (MPA/MCJ) and
- with the Department of History (MPA/ MA in Public History).

Students in a joint degree program can earn two master's degrees with fewer credits than would be required to earn those degrees independently.

Admission

Prospective graduate students in either the MA or MPA should demonstrate a 3.0 grade point average for the second half of their undergraduate course work. For students with a GPA of less than 3.0, GRE scores are required, though this requirement may be waived if the undergraduate degree was awarded more than five years before applying. Applicants to either program are required to submit an application online. See instructions at: <https://apply.nmsu.edu/apply/>. Applications include three letters of recommendation, a writing sample, and a personal statement concerning their interest in pursuing a graduate degree. Additional information concerning program requirements and the admission process can be obtained from either the department's MA chair or MPA director. Under exceptional circumstances the department may exempt students from the minimal requirements. Application for admission to the Graduate School should clearly indicate the program in which the student wishes to enroll. Applications for admission to the MPA program are reviewed twice a year, once in the Fall semester and once in the Spring semester.

Students interested in a joint degree option must apply and be accepted in to the two departments separately, and indicate their interest on their applications in one of the joint degree programs.

General Requirements

Students in both the MA and MPA programs select either a thesis or non-thesis option. Students planning on continuing their studies in a doctoral program or wishing to establish expertise related to a specific career objective are strongly encouraged to select the thesis option. The non-

thesis option is suggested for students desiring immediate employment or seeking to enhance their current employment situations. Course work outside the department must have prior advisor approval to ensure a well-integrated program of study. Complete information on the requirements for either program should be obtained directly from the department. Most MA and MPA courses are offered in the evening.

Minors

The Department of Government offers a general undergraduate Government minor and specialized sub field minors. In addition, the department participates in an interdisciplinary minor in Contemporary Social Studies with History and other departments.

A student cannot earn both a B.A. in Government and a general minor in Government. Government majors may pursue a subfield minor in the department, however, they cannot double count any upper division courses in Government toward the minor.

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Government - Bachelor of Arts (p. 678)
- Law and Society - Supplemental Major (p. 682)

Master Degree(s) & Dual Degree(s)

- Government - Master of Arts (p. 149)
- MPA-MCJ Program - Dual Degree (p. 157)
- Public Administration - Master of Public Administration (p. 159)

Minors for the Department

- American Government and Politics - Undergraduate Minor (p. 680)
- Comparative Politics - Undergraduate Minor (p. 681)
- Government - Undergraduate Minor (p. 681)
- International Relations - Undergraduate Minor (p. 681)
- Political Theory - Undergraduate Minor (p. 681)
- Public Administration - Undergraduate Minor (p. 681)
- Public Law - Undergraduate Minor (p. 682)
- Security Studies - Graduate Minor (p. 218)

Professor, Neil Harvey, Department Head

Professors Harvey; **Associate Professors** Conner, Hirschauer, Medina, Rosendorf; **Assistant Professors** Kang, Lee, Sukala, Ter-Mkrtyan; **College Professor** Seckler; **Emeritus Professors** Baker, Hynes, Lapid, Slaton, Taggart, Winn.

N. Harvey, Ph.D., Department Head (Univ. Essex) - Mexican politics, comparative politics, Latin America, migration and border politics; N. Baker, (emerita) Ph.D. (Tulane Univ.) - public law, American politics, presidency; T. Conner, Ph.D., (Univ. Oklahoma) - public administration, Native American politics, public budgeting; S. Hirschauer, Ph.D., (Old Dominion University) - international relations, security studies, gender, migration and identity, comparative politics; P. Hynes (emerita) Ph.D., (New Mexico State University) - Commercial Space Research, Personal and Commercial Spaceflight; S. Kang, Ph.D., (Univ. Georgia) - public and non-profit management, organizational theory and behavior, public sector volunteering; Y. Lapid, (emeritus) Ph.D., (Columbia Univ.) - international relations theory, comparative foreign policy, international organizations; C. Lee, Ph.D., (Rutgers University) - public management, non-profit management, civil society and political participation, equity and social justice; C. Medina, Ph.D., (Univ. Colorado,

Denver) - public administration, public policy, education policy, qualitative methods; N. Rosendorf, Ph.D., (Harvard Univ.) - international relations, cultural diplomacy, US foreign policy; K. Seckler, J.D. (Univ. of New Mexico) - Law and Society, New Mexico state and local government, US Supreme Court, US and NM Constitutions; C. Slaton (emerita) Ph.D., (Hawaii) - American politics, American political thought, university and community engagement, public administration, conflict resolution; W. Taggart, (emeritus) Ph.D., (Florida State) - public administration, public policy, American politics; A. Ter-Mkrtyan, Ph.D., (Univ. Oklahoma) - nonprofit governance and accountability, environmental policy and administration, energy policy; R. G. Winn, (emeritus) Ph.D., (Arizona State) - public administration, policy analysis, environmental policy

Political Science Courses

POLS 1110G. Introduction to Political Science

3 Credits (3)

This course covers fundamental concepts in political science, such as political theories, ideologies, and government systems.

Learning Outcomes

1. Construct reasoned civic discourse to advocate a stance or examine alternate positions.
2. Identify fundamental concepts and theories in political science.
3. Analyze data and information in order to gain a deeper understanding of the material.
4. Articulate how the public influence and are influenced by politics.
5. Identify and compare government systems from democracy to authoritarian, as well as models of analysis of contemporary international relations.

POLS 1111. Introductory Government Seminar

1 Credit (1)

Introduction to the government major. Designed to assist students in planning college experience and preparing for upper division course work and research. May be repeated up to 1 credit.

Learning Outcomes

1. This course is designed for the beginning government major.
2. Its goal is to improve your educational experience at the university and within the Department of Government. In this class we hope to develop some basic skills necessary for successful completion of a degree in Government.
3. These include the skills of critical reading, critical writing, oral presentation and research methods.
4. Additionally, we will use this seminar to introduce you to Government faculty, to plan your government degree and to acquaint you with the services and opportunities the department and the university has to offer.
5. Finally, we hope to begin the discussion of where you will go next, when you complete your degree in Government.

POLS 1120G. American National Government**3 Credits (3)**

This course explains the role of American national government, its formation and principles of the Constitution; relation of state to the national government; political parties and their relationship to interest groups. This course also explains the structure of the legislative, executive, and judicial branches.

Learning Outcomes

1. Explain the historical and political foundations of the government of the United States;
2. Explain the precursors to, and the development and adoption of the United States Constitution;
3. Explain the United States federal system, the basics of federalism, and the changing relationship of state and federal power;
4. Describe the power, structure and operation of the main institutions of government, namely the legislative, executive, judicial, and the federal bureaucracy;
5. Explain the development and role of political parties and interest groups;
6. Identify the constitutional basis of civil rights and civil liberties and their changing interpretation; and
7. Describe the role of demographics, public opinion and the media in American politics.

POLS 1130G. Issues in American Politics**3 Credits (3)**

This course is designed to introduce the students to the contemporary study of American political issues. The course analysis of government policies, examining various approaches to the economy, democracy and the structure and the function of American political institutions.

Learning Outcomes

1. Explain the basic themes and concepts of political science and their application to contemporary issues.
2. Explain the major forces, interests, and institutions of American democratic politics.
3. Describe and define how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions.

POLS 2120G. International Relations**3 Credits (3)**

This course covers the analysis of significant factors in world politics, including nationalism, national interest, political economy, ideology, international conflict and collaboration, balance of power, deterrence, international law, and international organization.

Learning Outcomes

1. Explain the interrelationships between countries and people in the world,
2. Demonstrate an awareness of current events in the world.
3. Describe several theories of International Relations
4. Explain and identify theories of power and decision making among states in the world.
5. Describe and evaluate issues that relate to International Politics, and how individuals are affected by them.
6. Describe the role of Intergovernmental Organizations in International Politics.
7. Identify the role war plays in International Politics.
8. Explain how economics is intertwined with International Politics.
9. Demonstrate an understanding of role of international terrorism and its impacts on global diplomacy. 1
10. Articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, history, government, and social institutions.

POLS 2996. Special Topics**3 Credits (3)**

Specific topics to be announced in Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

POLS 300. Political Research Skills**3 Credits (3)**

Introduction to methods of political analysis and fundamentals of research design, including basic methods for the collection and analysis of political data.

POLS 308. Prepping for Law School Admissions Test**1 Credit (1)**

This workshop helps students understand the law school application process and prepare to take the Law School Admissions Test (LSAT). May be repeated up to 2 credits.

Learning Outcomes

1. To prepare students to do well in the Law School Admissions Test (LSAT).
2. To help students understand the law school application process.

POLS 313. Model United Nations**3 Credits (3)**

Issues related to the United Nations and international law/organizations through simulations, discussions and research projects.

Prerequisites: GPA of 2.5 or better and consent of instructor.

POLS 314. Advanced Model UN**3 Credits (3)**

Advanced topics, research and preparation for Model United Nations activities. Consent of instructor required. Restricted to: Main campus only.

Prerequisite(s): POLS 313, minimum GPA 2.5.

POLS 315. Politics and Film**3 Credits (3)**

Exploration of political themes, images, and representation in film and other media. May be repeated for a maximum of 6 credits under different subtitles.

POLS 320. Making Public Policy**3 Credits (3)**

The course examines how U.S. public policy is made, including the examination of the major institutional and non-institutional players, politics, issues and power critical to the policy process. Interactive discussion sessions bridge theory to policy-making and political action in substantive policy issues. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of how public policy is made in the United States at various levels of government (federal, state and local) and in relation to demands from interest groups and other stakeholders
2. Develop knowledge of specific public policy areas (such as environmental policy, energy policy, etc.
3. Develop excellence in research skills as well as written and oral communication of topics in the area of domestic policy

POLS 321. Topics in Public Policy**3 Credits (3)**

Course examines issues in public policy. May be repeated up to 6 credits.

Learning Outcomes

1. Develop knowledge and analytical skills with regard to particular topics within the subfield of public policy

POLS 324. Environmental Policy & Administration**3 Credits (3)**

This course introduces students to the history, development and formation of the central dimensions of environmental policy, politics and administration in the United States. Students also explore key substantive environmental policy issues (energy policy, natural resource and waste management policies, national parks and wildlife protection, and air and water pollution), and the global dimensions of climate change, environmental justice and sustainability. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of historical and contemporary aspects of environmental policy, politics and administration in the United States
2. Develop ability to critically analyze environmental policy debates
3. Develop ability to effectively communicate analysis of environmental policy and administration in oral and written forms

POLS 325. Education Policy and Politics**3 Credits (3)**

Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy as the main approach. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the historical development and changing federal role in education policy, including major federal education laws and reforms.
2. Examine critical issues and trends in federal education policy, as well as the various actors and perspectives involved in education debates and decision-making.
3. Explore policy process theories and apply them to the analysis of federal education events.
4. Study in depth a federal education policy issue by examining its progress through the various stages of the policy process.

POLS 326. Public Policy & Indigenous Communities**3 Credits (3)**

Study of historical and contemporary public policy and law that deals with the special legal status of Native American tribes and tribal members.

Learning Outcomes

1. Become familiar with the body of public policy and the area of law that deals with the special legal status of Native American tribes and tribal members
2. Examine the history, the public policy and the law that has impacted the ability of these indigenous communities to exercise their inherent sovereignty
3. Investigate the history, legislation, policies and landmark cases that have shaped this important area of government in the United States

POLS 330. Introduction to Public Administration**3 Credits (3)**

Public administration involves the full range of government agencies, non-profit organizations, and private contractors involved in the implementation of public policy at the federal, state, and local level. This course introduces students to the formal study of public administration and will explore major challenges in public service, the management of public and non-profit organizations, administrative ethics and law, leadership theory, and financial and personnel management. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. Gain a strong foundation in the the major issues, theories and challenges of public administration
2. Develop skills to critically analyze key problems in public administration
3. Develop ability to effectively communicate the main issues, theories and challenges of public administration in both oral and written form

POLS 331. Special Topics in Public Administration**3 Credits (3)**

Special topics in public administration. May be repeated for a maximum of 6 credits under different subtitles.

POLS 335. Management of Nonprofit Organizations**3 Credits (3)**

This course provides an introduction to the nonprofit sector, its nature, scope, and functions, and an overview of a range of nonprofit management concerns and practices. Students will confront the critical issues facing the sector. Activities are designed to expand the management skills of students by offering analytical tools and knowledge, and providing opportunities to test the application of these skills. May be repeated up to 3 credits.

Learning Outcomes

1. Gain a strong foundation in the study of nonprofit organizations and management issues
2. Expand students' management skills
3. Gain experience in application of management skills

POLS 343. Congress and the Legislative Process**3 Credits (3)**

This class reviews the history, structure, membership, operation, power and culture of the American Congress. Restricted to: Main campus only.

Learning Outcomes

1. Develop knowledge of the functions and goals of the US Congress, specifically how federal legislation is drafted, debated and passed.
2. Develop skills in debating legislative bills through in-class simulations
3. Develop excellence in research and written and oral communication of significant topics in the study of the US Congress and legislative processes

POLS 345. The Supreme Court**3 Credits (3)**

This class studies the history and operation of the Supreme Court, as well as landmark cases that have shaped American government and the Court.

POLS 348. Political Parties and Interest Groups**3 Credits (3)**

Organization, principles, and functions of political parties and interest groups in the U.S.

POLS 350. Special Topics in American Government**3 Credits (3)**

Special topics in American government. May be repeated for a maximum of 6 credits under different subtitles.

POLS 353. Women and Politics**3 Credits (3)**

An examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Also explores the influence of feminism in changing women's roles socially, legally, and politically.

POLS 354. Native American Politics**3 Credits (3)**

This course explores the rights of Native Americans and the politics, policy, and administration of tribal governments with a focus on the history and current relationship between Native Nations and the US political system. Students will learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization.

Restricted to: Main campus only.

Learning Outcomes

1. Develop a strong understanding of historical and contemporary issues in Native American policy in the United States
2. Develop skills to critically analyze debates over Native American policy
3. Develop skills to effectively communicate analysis of Native American policy in oral and written forms

POLS 360. International Relations Theory**3 Credits (3)**

Introduction to major theories and concepts for understanding fundamental problems and issues in international relations May be repeated up to 3 credits.

Learning Outcomes

1. Identify and critically evaluate the major concepts (theory) and practices (reality) of International Relations
2. Identify, define, and critically think about themes and key issues unique to International Relations and evaluate their pros and cons
3. Develop knowledge, analytical ability and critical thinking about global efforts and challenges to International Relations

POLS 361. Special Topics in International Relations**3 Credits (3)**

Course examines contemporary issues in international relations. May be repeated under different subtitles.

POLS 362. International Political Economy**3 Credits (3)**

Political factors in international economic relations; theories of political economy.

POLS 364. National Security**3 Credits (3)**

Analysis of theories, concepts, historical development and current issues of significance for US national security

Learning Outcomes

1. Analyze international issues from a National Security policy perspective and examine major theoretical approaches (or "paradigms") of National Security
2. Critically examine the historical evolution and the most prominent and contemporary challenges of National Security
3. Acquire abilities to synthesize and articulate important debates in the National Security literature and connect them to current national, regional, and global crises.

POLS 365. Introduction to Security Studies**3 Credits (3)**

Introduction to the field of security studies, with focus on theories and issues in the study of security in international politics, including emerging 21st century security challenges related to cyberspace, A.I., information warfare and virtual deterrence.

Learning Outcomes

1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or “paradigms”) of security studies
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 366. American Foreign Policy**3 Credits (3)**

Formulation, content and rationale of current foreign policies of the U.S. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of the historical development and current practice of US foreign policy
2. Develop the skills necessary to conduct independent research and written and oral communication of significant topics in US foreign policy

POLS 367. Terrorism**3 Credits (3)**

An introductory course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism.

POLS 368. Human Security**3 Credits (3)**

Introduction to human security, its focus on security of the individual as opposed to the security of the state since the end of the Cold War and the emergence of global challenges such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes

1. Identify and critically evaluate the major concepts and practices in human security
2. Define, identify and critically think about key issue areas in human security
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 370. Comparative Politics**3 Credits (3)**

Comparative study of similarities and differences to be found in political systems across the world, with emphasis on the structure and performance of modern states, accountability of government institutions, parties and elections, social movements, and public policies. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of main issues and concepts in the study of comparative politics.
2. Increase analytical ability to explain similarities and differences between political systems
3. Promote critical thinking regarding the human and environmental consequences of government policies in addressing common public policy problems.

POLS 371. Latin American Politics**3 Credits (3)**

Comparative study of government systems and political change in Latin American countries, with focus on challenges of social inequality, democratization, regional integration, relations with the United States, and the rights of women, LGBTQ* community, Indigenous and Afro-descendent peoples. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of how historical legacies, domestic politics, and global relations shape contemporary politics in Latin America
2. Increase analytical ability to explain similarities and variation in contemporary politics in Latin America
3. Develop critical thinking regarding how to explain the persistence and political implications of socioeconomic inequalities and discrimination in Latin America
4. Develop oral and written communication skills in expressing knowledge, concepts, and comparative analysis

POLS 372. Special Topics in Comparative Politics**3 Credits (3)**

Course examines contemporary issues in comparative politics. May be repeated under different subtitles. Restricted to: Main campus only.

POLS 373. Resistance Movements in World Politics**3 Credits (3)**

Comparative study of contemporary resistance movements and social protests around the world with a focus on their origins, demands, ideologies, strategies and impacts. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of concepts of power and resistance movements and their applicability in many parts of the world.
2. Increase analytical ability to explain variation in the motives, strategies and impacts of resistance movements.
3. Promote critical thinking regarding how we choose to address inequalities, injustices and dissent.
4. Develop oral and written communication skills of key concepts and original research.

POLS 378. U.S.-Mexico Border Politics**3 Credits (3)**

Analysis of contemporary challenges facing the U.S.-Mexican border, including immigration, binational cooperation, drug trafficking, corruption, human rights violations and security. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of the main issues and controversies in US-Mexico border politics.
2. Increase analytical ability to explain the implementation and results of border policies for local communities and the environment.
3. Promote critical thinking regarding the merits of alternative policies and future possibilities.

POLS 379. Mexican Politics**3 Credits (3)**

Study of the politics and government of contemporary Mexico with focus on challenges of democratization, human rights, public policies, Mexico-US relations, and internal security. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of main issues and concepts in the study of Mexican politics.
2. Develop ability to conduct online research on current issues in Mexican politics.
3. Promote critical thinking regarding the causes and consequences of criminal violence in Mexican politics and how it may be best addressed.

POLS 380V. Contemporary World Political Ideologies**3 Credits (3)**

Introduction to the prevailing political ideologies in the modern world and the ways in which modern nations operating under one or more of these ideologies attempt to answer fundamental questions about the allocation and distribution of rights, liberties, and other things of value. In addition, the course work and discussions attempt to address recent political, social, and economic events in various areas of the world.

POLS 382. Classical Political Thought**3 Credits (3)**

Analysis of main currents in political thought from ancient Greece and Rome to the high Middle Ages.

POLS 383. Modern Political Thought**3 Credits (3)**

Historical and theoretical examination of political ideas and ideologies from Machiavelli to Nietzsche. Topics include liberalism, conservatism, romanticism, communism, and Nihilism.

POLS 385. American Political Thought**3 Credits (3)**

Introduction to major American thinkers and historical currents from colonial time to the present. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the nature of the specifically American form of constitutionalism, as compared to its alternatives;
2. To understand the idea of progress in American history, including its colonial origins and its contemporary manifestation under the terms of progressivist ideology;
3. To understand the meaning and origin of American conservatism, and its place in contemporary political life;
4. To understand the dynamics of shifting political and institutional power relationships (including issues of centralization and decentralization) in relation to the above; and
5. To understand the general relationship between cultural phenomena and questions of political order.

POLS 387. Religion and Politics**3 Credits (3)**

Survey of major points of interaction between politics and religion in the U.S., using theoretical, historical, and institutional analysis.

POLS 390. Special Topics in Public Law**3 Credits (3)**

Course examines various issues in public law. May be repeated under different subtitles.

POLS 391. Constitutional Law**3 Credits (3)**

The class explores the reasoning and political context of the Supreme Court cases that define the distribution and limits of governmental powers and duties under the U.S. Constitution, including separation of powers and federalism. Restricted to: Main campus only.

POLS 392. Civil Liberties**3 Credits (3)**

The course examines the reasoning and political context of major Supreme Court cases defining constitutional rights of free speech, religious liberty, free press and criminal procedural rights.

POLS 394. Judicial Process**3 Credits (3)**

Class examines the structure, function and purpose of the American judicial system. Restricted to: Main campus only.

POLS 395. Law and Society**3 Credits (3)**

Class critically explores the development, role and impact of law on society, covering different philosophies and theories of law, different world legal systems, and different issue areas of law and society. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the development, role and impact of law on society
2. To gain knowledge of different philosophies and theories of law
3. To gain knowledge of different legal systems around the world and key issues in law and society
4. To gain skills in critical analysis of debates in law and society
5. To gain skills in effective communication of analysis of law and society in oral and written forms

POLS 396. International Law**3 Credits (3)**

Nature, growth, and scope of law of nations, rights and obligations of states in peace and war, current issues.

POLS 399. New Mexico Law**3 Credits (3)**

Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico.

Crosslisted with: CJUS 399. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analyze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

POLS 405. Directed Readings**1-3 Credits**

Individualized readings. Course subtitled. May be repeated for a maximum of 6 credits. Graded S/U. Consent of instructor required.

POLS 406. Independent Study**1-3 Credits**

Individualized research. Course subtitled. May be repeated for a maximum of 6 credits. Consent of instructor required.

POLS 407. Workshop**1-6 Credits (1-6)**

Focus on skills related to careers in government and political science. Specific topics announced in the Schedule of Classes; Only three credits apply toward government major or minor requirements. May be repeated up to 6 credits.

Learning Outcomes

1. Develop skills related to careers in government and public service

POLS 410. Internship**1-12 Credits**

Hands-on experience working with public agencies, political campaigns, elected officials & non-profits. May be repeated for a maximum of 12 credits; only 3 credits apply toward government major or minor requirements. Consent of instructor required. Graded: S/U.

Prerequisite(s): Completion of 12 government credits, 2.5 GPA, junior and above standing.

POLS 411. Service Learning Experience**3 Credits (3)**

Experiential learning through a community service project. May be subtitled to reflect service activity. May be repeated for a total of 6 credits; only 3 credits apply toward government major or minor requirements.

Prerequisites: completion of 12 government credits, junior or above standing, and consent of instructor.

POLS 412. Practicum in Student Government**3 Credits (3)**

Research of issues in student government. Consent of instructor required. Graded: S/U.

Prerequisite(s): Student government participation, completion of 12 POLS credits, junior or senior standing.

POLS 415. Senior Seminar**2 Credits (2)**

Review and integration of political skills acquired in the Government Department. Students will focus on critical essay writing and oral presentation of a synthesis of knowledge gained from prior departmental coursework. May be repeated up to 2 credits.

Learning Outcomes

1. To integrate knowledge from various classes during the students' coursework as a Government major.
2. To effectively communicate in oral and written forms a synthesis of main issues, theories, scholars and actors in the various sub-fields of the government major.

POLS 468. Rebels, Guerrillas, and Terrorists in Modern Latin America**3 Credits (3)**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Columbia's FARC, and Mexico's Zapatistas. Same as HIST 331.

POLS 469. Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOCI 4460. May be repeated up to 3 credits.

POLS 493. Mass Communications Law**3 Credits (3)**

Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as JOUR 493 and COMM 493.

POLS 502. Research Methods in Government**3 Credits (3)**

Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications. MPA students must complete this class with a B- or better. MA students must complete either POLS 502 or POLS 503 with a B- or better.

POLS 503. Qualitative Research Methods**3 Credits (3)**

An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology (the study of knowledge) and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects. MA students must complete either POLS 503 or POLS 502 with a B- or better.

POLS 505. Directed Readings**1-3 Credits**

Selected topics in government. May be repeated for a total of 6 credits. Graded S/U.

Prerequisite: consent of instructor.

POLS 510. Internship**1-6 Credits**

Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U.

Prerequisite: approval of graduate advisor.

POLS 517. Selected Topics in Government**3 Credits (3)**

Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.

POLS 519. Proseminar in Public Administration**3 Credits (3)**

Review of classic and contemporary theory and practice in public administration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. To be completed with a B- or better.

Prerequisite(s): 30 credits of M.P.A.

POLS 522. Public Sector Economics I**3 Credits (3)**

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as AEEC 522.

POLS 527. Issues in Public Management**3 Credits (3)**

Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.

POLS 530. Seminar in Public Policy**3 Credits (3)**

Survey of the political, administrative, and technical aspects of policy making in government. MA students taking POLS 530 as part of their core requirements must complete the class with a B- or better.

POLS 536. Public Policy and Indigenous Communities**3 Credits (3)**

Indigenous communities are found throughout North, Central and South America. This course addresses the history, development and governance of these communities. Different sections of the course may choose to focus on different indigenous communities. All courses will consider the principles of governance internal to indigenous communities as well as the governing relationships between indigenous communities and modern states.

POLS 537. Issues in Public Policy**3 Credits (3)**

Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.

POLS 540. Seminar in Public Administration**3 Credits (3)**

Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector. MA students taking POLS 540 as part of their core requirements must complete the class with a B- or better.

POLS 541. Public Budgeting**3 Credits (3)**

Budgetary processes; budget classification, analysis, and evaluation. MPA students must complete this class with a B- or better.

POLS 542. Public Sector Human Resources Management**3 Credits (3)**

Exploration of public personnel systems and practices, including job analysis, compensation, performance evaluation, recruitment, and labor-management relations. MPA students must complete this class with a B- or better.

POLS 543. Skills Workshop**1-6 Credits (1-6)**

Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specific skills related to the practice of public administration

POLS 544. Public Policy Analysis**3 Credits (3)**

Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. MPA students must complete this class with a B- or better.

Prerequisite(s): POLS 502 or consent of instructor.

POLS 547. Government Organizations**3 Credits (3)**

Historical overview and present applications of organization theory in public management. MPA students must complete this class with a B- or better.

POLS 548. Public Sector Leadership**3 Credits (3)**

Theories and styles of leadership.

POLS 549. Ethics in Government**3 Credits (3)**

Examination of standards, perspectives, and issues for ethical decision-making in public agencies. MPA students must complete this class with a B- or better.

POLS 550. Seminar in American Politics**3 Credits (3)**

Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation. MA students taking POLS 550 as part of their core requirements must complete the class with a B- or better.

POLS 560. Seminar in International Relations Theory**3 Credits (3)**

A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics. MA students taking POLS 560 as part of their core requirements must complete the class with a B- or better.

POLS 563. Issues in International Relations**3 Credits (3)**

Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.

POLS 564. Advanced National Security Policy**3 Credits (3)**

Major topical, theoretical, and regional issues in national security policy.

POLS 565. Advanced Issues in Security Studies**3 Credits (3)**

Advanced study of theories, concepts and key issues in the area of security studies, including historical security problems and emerging 21st century challenges related to cyberspace, A.I., information warfare and virtual deterrence.

Learning Outcomes

1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or “paradigms”) of security studies.
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies.
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 567. Advanced Issues in Terrorism**3 Credits (3)**

Advanced study of theories of the causes of terrorism, responses to varieties of terrorism, and major issues in the study of terrorism, historically and today

Learning Outcomes

1. Examine core ideas in studies of terrorism (theoretically and factually)
2. Introduce and develop an understanding about the causes of terrorism and possible solutions
3. Acquire abilities to gain knowledge, think critically, analytically, and synthetically of countries and violence, and varieties of terrorism over time and throughout the world.

POLS 568. Advanced Issues in Human Security**3 Credits (3)**

Advanced study of major theories, concepts and issues in the study of human security, such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes

1. Identify and critically evaluate the major concepts and practices in human security;
2. Define, identify and critically think about key issue areas in human security.
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 569. Advanced Issues in Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOCI 5460. May be repeated up to 3 credits.

POLS 570. Seminar in Comparative Politics**3 Credits (3)**

Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries. MA students taking POLS 570 as part of their core requirements must complete the class with a B- or better.

POLS 574. Contemporary Comparative Studies**3 Credits (3)**

Major topical, theoretical, and regional issues in international politics. May be repeated once.

POLS 578. Seminar in the U.S.-Mexican Border**3 Credits (3)**

An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.

POLS 579. Seminar in Mexican Politics**3 Credits (3)**

Advanced research on politics and government of Mexico.

POLS 580. Seminar in Political Theory**3 Credits (3)**

Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter. MA students taking POLS 580 as part of their core requirements must complete the class with a B- or better.

POLS 587. Seminar in Religion and Politics**3 Credits (3)**

Historical, theoretical and comparative analyses of the interaction between politics and religion.

POLS 593. Issues in Public Law**3 Credits (3)**

Selected issues in public law. May be repeated under a different subtitle for a total of 6 credits.

POLS 596. International Law**3 Credits (3)**

Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.

POLS 598. Special Research Programs**1-3 Credits**

Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.

POLS 599. Master's Thesis**1-15 Credits**

Thesis.

Name: Marilyn Crawford

Office Location: Breland Hall, Room 337

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Website: <https://deptofgov.nmsu.edu/>

Government - Bachelor of Arts Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
	<i>English Composition - Level 1</i> ¹	
	<i>English Composition - Level 2</i> ¹	
	<i>Oral Communication</i> ¹	
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
	or HNRS 2180G Citizen and State Great Political Issues	
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ⁴		6
Departmental/College Requirements		
The department requires (POLS 1120G) and (POLS 1110G or HNRS 2180G) as degree requirements. These courses will count towards the General Education and Departmental requirements ³		
POLS 1111	Introductory Government Seminar ³	1
POLS 300	Political Research Skills	3
or		
Another social science research methods course ⁵		
<i>Select one upper-division course from four of six subfields:</i>		12
Public Administration and Policy (POLS 20/30 series)		
American Government and Politics (POLS 40/50 series)		
International Relations (POLS 60 series, may include HNRS 304V)		
Comparative Politics (POLS 70 series may include HNRS 307V)		
Political Theory POLS 80 series may include POLS 380V)		
Public Law (POLS 90 series)		
POLS 415	Senior Seminar (take in final year)	2
Select additional credits in government to bring total credits in major to 33, including 20 upper-division.		9
Second Language: (required - see below)		0-14
Electives, to bring the total credits to 120 ⁶		38-54
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the Mathematics course of their course first.

³ Majors should complete these lower level requirements before registering for upper-division government credits.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁵ A list of approved options is available in the department office.

⁶ Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Note: Students may not count S/U grades taken in their major unless the particular course is regularly graded S/U. All courses must be passed with grades of C- or better. In addition, while research methods courses taken outside of the department may count toward the methods requirement, only POLS 300 Political Research Skills counts toward the 33 credits in the major.

Up to twelve hours of internship credit are available. However, only three hours count toward the major. Internship guidelines are available in the department office and on the Government Department web page, <http://deptofgov.nmsu.edu/>.

Second Language Requirement

For the Bachelor of Arts in Government there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
CHIN 2120 or FREN 2120 or GRMN 2120	Mandarin Chinese IV French IV German IV	3

or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:
Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:
Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
Choose from one of the following:		3
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
FYEX 1112	The Freshman Year Experience	3
Area V: Humanities Course ²		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Choose from one of the following:		3
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
POLS 1111	Introductory Government Seminar	1
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		30

Sophomore		
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
POLS Series Elective Courses		6
First Course in Second Language Series (or Elective)		3-4
Next Course in Second Language Series (or Elective)		3-4
General Education Elective Course		3
POLS 300	Political Research Skills	3
Elective Courses		9
Credits		30-32
Junior		
Next Courses in Second Language Series (or Elective)		6
VWW: Viewing a Wider World Courses ³		6
POLS Series Elective Courses		6
POLS Elective Course		3
Upper-Division Elective Course		3
Elective Courses		6
Credits		30
Senior		
POLS 415	Senior Seminar (Spring Only)	2
POLS Upper-Division Elective Courses		6
Upper-Division Elective Courses		18
Elective Course		4
Credits		30
Total Credits		120-122

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

American Government and Politics - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series,

including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

Comparative Politics - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

Government - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from different subfields.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

International Relations - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	

Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.	12
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Total Credits	18
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The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

Political Theory - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

Public Administration - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

Public Law - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		18

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Contemporary World Political Ideologies (political theory), and 90 series (public law).

Law and Society - Supplemental Major

The Department of Government also coordinates a supplementary major in law and society that may be taken in addition to a regular major. The program is designed to allow students to combine law-related classes offered across a range of departments and disciplines. It is of particular interest to undergraduates interested in law school or who contemplate careers in fields closely related to the legal profession, such as government, politics, social work or law enforcement.

Requirements

The supplementary major consists of 24 credits chosen from the courses listed below. At least 18 credits must be earned in upper-division courses and 6 credits must be earned from listed courses outside the student's primary major. Candidates for the Law and Society degree must declare their supplementary major prior to completing the last 9 credits of the program.

Prefix	Title	Credits
Core Courses		
Select three from the following four courses, or two from this group and any one from the next group immediately below it:		9
CJUS 1120	Criminal Law	
POLS 395	Law and Society	
POLS 391	Constitutional Law	
POLS 394	Judicial Process	
You may choose one of the following three classes to count as a core course:		
CJUS 306	Criminal Procedural Law	
POLS 392	Civil Liberties	
JOUR 493	Media Law	
Communication Skills		
Select one from the following:		3
COMM 351	Persuasion Theory and Practice	
ENGL 2130G	Advanced Composition	

PHIL 448	Writing Philosophy	
Critical Thinking Skills		
Select one from the following:		3
POLS 382	Classical Political Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 312	Formal Logic	
Jurisprudence		
Select one from the following:		3
CJUS 307	Law of Evidence	
CJUS 424	Forensic Law	
POLS 385	American Political Thought	
PHIL 376	Philosophy of Law	
PSYC 330	Psychology and the Law	
SOCI 3510	Crime and Society	
Legal Policy Issues		
Select two from the following:		6
BLAW 316	Legal Environment of Business	
BLAW 385V	Employment and Consumer Law	
CJUS 2120	Criminal Courts and Procedure	
CJUS 332	Correctional Law	
POLS 345	The Supreme Court	
POLS 387	Religion and Politics	
POLS 390	Special Topics in Public Law	
POLS 396	International Law	
HNRS 335V	Legal Issues in Modern Society	
HRTM 304	Hospitality and Travel Law	
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 320	Social and Political Philosophy	
SOCI 3520	Juvenile Delinquency	
Or either one of the following:		
CJUS 399	New Mexico Law	
POLS 399	New Mexico Law	
Total Credits		24

History Undergraduate Program Information

An undergraduate degree in history prepares students for careers in: teaching; law; public service; management; journalism; education; communications; travel counseling; and library, museum and archival staff work. Students master skills including the ability to read critically, to formulate arguments, to conduct historical research, and to synthesize arguments and create novel interpretations.

Graduate Program Information

The Department of History offers graduate work leading to the Master of Arts degree. In addition to fulfilling the basic requirements for admission to the Graduate School, applicants must present undergraduate passage of at least 12 credits in history with grades of B or higher, including 6 upper division history credits. Those lacking this preparation must normally make up deficiencies before beginning graduate course work. Candidates who choose a course of study requiring a foreign language will be responsible for their own language preparation.

Students applying for admission to the graduate program in history are required to submit an application form and a transcript to the Graduate School and a strong writing sample, three letters of recommendation ideally from History faculty members at NMSU or other institutions, and

a two-to-three page statement of purpose to the Department of History, approximately four months in advance of the desired enrollment date. Applicants for graduate assistantships and fellowships must submit a letter of application, a transcript, and three letters of recommendation to the department by February 15 for the fall semester, and by October 15 for the spring semester. Students who are not applying for graduate assistantships and fellowships may apply at any time for acceptance into the graduate program.

Degrees for the Department

Bachelor Degree(s)

- History - Bachelor of Arts (p. 696)

Master Degree(s) & Dual Degree(s)

- History (Public History) - Master of Arts (p. 150)
- History - Master of Arts (p. 150)
- Public History and Public Administration - Dual M.A. Degree (p. 163)

Minors for the Department

- History - Graduate Minor (p. 215)
- History - Undergraduate Minor (p. 697)

Elizabeth Horodowich, Department Head

Professors Bronstein, Brooks, Cioc-Ortega, Garcia-Bryce, Hammond, Horodowich, Malamud; **Associate Professors** Orzoff; **College Professors** E. Masson

J. L. Bronstein, Ph.D. (Stanford)– U.S., Britain; N. M. Brooks, Ph.D. (Columbia)– Russia/Soviet Union, modern Europe, modern science; M. Cioc-Ortega, Ph.D. (California-Berkeley)– Europe, US, public history; I. Garcia-Bryce, Ph.D. (Stanford)– Latin America, Peru; K. J. Hammond, Ph.D. (Harvard)– China, East Asia; E. Horodowich, Ph.D. (Michigan-Ann Arbor)– early modern Europe, Mediterranean; M. Malamud, Ph.D. (California-Berkeley)– ancient, medieval, Islam; A. Orzoff, Ph.D. (Stanford)– twentieth-century Europe, Eastern Europe, intellectual history.

History Courses

HIST 1105G. Making History

3 Credits (3)

General introduction to history: how historians carry out research and develop interpretations about the past.

Learning Outcomes

1. Understand and articulate the differences and similarities between history and memory;
2. Analyze and critically interpret primary sources and understand how others might interpret and use the same material in different ways;
3. Recognize and appreciate the diversity of historical experiences and the uses of historical memory in various societies;
4. Understand how historical experiences that include political, geographical, social, cultural, religious and intellectual experiences have been expressed across historical periods;
5. Understand how historical experiences and memories have shaped contemporary societies;
6. Identify and understand the degree to which history has been used and misused in the past;
7. Demonstrate improvement in their ability to read critically, think logically, and express themselves clearly in writing.

HIST 1110G. United States History I

3 Credits (3)

The primary objective of this course is to serve as an introduction to the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply 8
6. Students will APPLY historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 9

HIST 1120G. United States History II**3 Credits (3)**

The primary objective of this course is to serve as an introduction to the history of the United States from reconstruction to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the reconstruction to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 10 11

HIST 1130G. World History I**3 Credits (3)**

The primary objective of this course is to serve as an introduction to global history from ancient times to the 16th century. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for global history from ancient times to the 16th century. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1140G. World History II**3 Credits (3)**

The primary objective of this course is to serve as an introduction to global history from the 16th century to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of global history from the 16th century to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will Apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1150G. Western Civilization I**3 Credits (3)**

This course is a chronological treatment of the history of the western world from ancient times to the early modern era. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from ancient times to the early modern era. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. BloomTaxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 14

HIST 1160G. Western Civilization II**3 Credits (3)**

This course is a chronological treatment of the history of the western world from the early modern era to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from the early modern era to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1170. Survey of Early Latin America**3 Credits (3)**

The primary objective of this course is to serve as a survey of the history of Latin America from pre-Columbian times through independence. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create. apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: apply, analyze

HIST 1180. MODERN LATIN AMERICA**3 Credits (3)**

The primary objective of this course is to serve as a survey of the history of Latin America from independence to the present. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create. apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: apply, analyze

HIST 2110. Survey of New Mexico History**3 Credits (3)**

The primary objective of this course is to serve as an introduction to the history of New Mexico from the pre- Columbian times to the present day. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of New Mexico within the context of the Americas.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of New Mexico from pre-Columbian times to the present day. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating, credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 16

HIST 2245G. Islamic Civilizations to 1800**3 Credits (3)**

History of Islamic civilizations to 1800.

Learning Outcomes

1. By the conclusion of the course, the student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the seventh to the sixteenth century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West;
3. Critically read and evaluate historical evidence with the goal of forming an argument about historical evidence
4. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 2246G. Islamic Civilizations since 1800**3 Credits (3)**

History of Islamic civilizations since 1800.

Learning Outcomes

1. By the conclusion of the course, the student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the sixteenth century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West;
3. Critically read and evaluate historical evidence with the goal of forming an argument about historical evidence
4. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 2250G. East Asia to 1600**3 Credits (3)**

History of China, Korea, Vietnam, and Japan from earliest times through the sixteenth century. Emphasis on cultural and political developments and their social and economic contexts, and the interaction between East Asian societies.

Learning Outcomes

1. Students will learn the analytic skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2251G. East Asia since 1600**3 Credits (3)**

History of China, Korea, Vietnam, and Japan from the sixteenth through the twentieth centuries. Emphasis on internal development of each country, as well as the social and political impact of Western Imperialism, and the emergence of each country's unique version of modern society.

Learning Outcomes

1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes.

Community Colleges only. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

HIST 300. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

HIST 302V. Science in Modern Society**3 Credits (3)**

The social impact of scientific activity and thought from Newton to the present. The growth of modern scientific institutions; the political and social context of modern science. ENGL 1110G recommended.

HIST 308V. The History of Food**3 Credits (3)**

From the earliest uses of fire for cooking up through our modern age of fast food and organic gardening, human culinary traditions have long shaped and been shaped by the forces of history. This course offers a general overview of the history of food production and consumption in the West from prehistoric times through the 21st century, with a special focus on the various ways in which social and political history have impacted dining, taste, and cooking. Among a great variety of topics, we will focus on the origins of cooked food; ancient Hebrew dietary laws; the "spice revolution" and the great influence of Arabic cuisine on the kitchens of medieval Europe; emerging ideas about etiquette and table manners including the use of the fork; the advent of print and the first printed cookbooks; the Columbian Exchange and the arrival of foods from the New World; the rise of French cuisine; food and immigration; the global dominance of fast food; and sustainable food production and consumption in the modern era. We will pay a special emphasis throughout the course to the myriad ways in which food production and consumption in history have always been gendered, as well as influenced by ideas about social class.

Learning Outcomes

1. Master a general master narrative about the history of food in the Western World, including a variety of European countries;
2. Analyze the relationship between food and culture in a variety of countries and traditions;
3. Critically read and learn to evaluate secondary historical literature, grasping the strengths and weaknesses of historical monographs; and
4. Communicate a historical argument logically and effectively in a 20-page original research paper.

HIST 311V. Colonial Latin America**3 Credits (3)**

Social, political, and economic development from Columbus to the Wars of Independence. Research paper required.

HIST 312V. Modern Latin America**3 Credits (3)**

Post-revolutionary developments in the nineteenth and twentieth centuries; the role of Latin America in world affairs and the Inter-American system. Research paper required.

HIST 313. Making the American West**3 Credits (3)**

Development of the American West from 1803 to 1900 with emphasis on conquest, federal and corporate roles in western development, environmental change, and the Mythic West. Includes meetings outside regular class time to view feature-length films.

HIST 320. American History Through Film**3 Credits (3)**

This course uses feature films as texts to examine the depiction of major themes and events in American history and society. It considers both the accuracy of these depictions, and the way in which the historical viewpoint of feature films is influenced by factors including directorial point of view and popular memory. It also examines the influence of feature films on popular understandings of the American past. May be repeated up to 3 credits.

Learning Outcomes

1. Students will critically analyze and evaluate the accuracy and truthfulness of cinematic representations of episodes in U.S. history, and convey these analyses and evaluations orally and in writing.
2. Students will evaluate contemporary claims made concerning the value of films for historical understanding, and convey these analyses and evaluations orally and in writing.
3. Students will assess the ways in which films serve as historical documents that illuminate the cultural, social, and political history of the eras in which they were produced, and convey these analyses and evaluations orally and in writing.

HIST 321V. History of Korea**3 Credits (3)**

Social, political, and cultural history of Korea from earliest times through twentieth century. Emphasis on the interaction between Korean traditions and influences from China and the West. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will also understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will examine how people shape their culture and beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationships between science and technology and human values and behavior.

HIST 323. Cultural History of Later Imperial China**3 Credits (3)**

Covers art and literature of China from the Tang Dynasty (618-907) through the eighteenth century. Developments in cultural theory and practice are traced in the context of the social and economic changes fostering an understanding of Chinese cultural history and its legacy in East Asia today.

HIST 329. History of Egypt**3 Credits (3)**

History of Egypt from ancient times to the present.

HIST 330V. Introduction to Religious Studies**3 Credits (3)**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. May be repeated up to 3 credits.

HIST 331. Rebels, Guerrillas, and Terrorists in Modern Latin America
3 Credits (3)

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Colombia's FARC, and Mexico's Zapatistas. Same as POLS 468.

HIST 333. Renaissance Europe

3 Credits (3)

This course explores the cultural, social, and political developments of early modern Europe between 1350-1650. This period witnessed a dramatic transformation between the medieval and modern worlds: a transition marked by new historical and artistic visions, the invention of the printing press, the discovery of the New World, the permanent fracturing of Christianity during the Protestant Reformation, the scientific revolution, and the rise of capitalism as a world system. We will consider these and other transformations in this time period both as they were understood by elite society as well as the impact of these innovations upon the daily lives of everyday people and women in particular.

Learning Outcomes

1. Identify the key historical facts, values, and ideas that shaped the history of Europe between 1400–1650;
2. Analyze the causes and effects of the Renaissance, the Age of Encounters, the Reformation, and the Scientific Revolution;
3. Identify the major artistic, literary, and technological contributions of individuals during this time period;
4. Describe how cultural exchanges reveal the global context of events in early modern Europe; and
5. Create well-supported historical arguments based on primary and secondary source evidence.

HIST 334. Art and Life in Renaissance Italy

3 Credits (3)

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ARTH 444.

HIST 338. World War I

3 Credits (3)

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war.

HIST 339. World War II

3 Credits (3)

Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement.

HIST 343. Recent American Military History

3 Credits (3)

Emphasis on American wars since the Civil War, and on factors contributing to the development of modern military systems.

HIST 347. Civil War Era 1840-1877

3 Credits (3)

Mexican-American War, development of secession, American Civil War, Reconstruction.

HIST 356. The Mexican Revolution

3 Credits (3)

Examines the history of modern Mexico through the lens of the Mexican Revolution, 1910-1920. Course covers military, political, social, cultural and economic developments that shaped Mexico during and after the Revolution.

HIST 361. African American History to 1877

3 Credits (3)

African background, slave trade, slavery; Civil War and Reconstruction; free blacks in a white society to about 1900. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period from the great African Empires (circa 900CE) to the end of the period of Reconstruction (1877), with particular focus on the experiences of African Americans.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 362. African American History, 1865-present

3 Credits (3)

Black Americans in the United States in the twentieth century; segregation; black leaders, organizations, methods and goals; white reaction; the struggle for equality. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period of the Civil Rights Movement through readings, interaction with primary source documents, essays, and discussions.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 366V. British Imperialism

3 Credits (3)

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

HIST 368. Teaching History

3 Credits (3)

Philosophical and practical issues of teaching history are explored. Designed to help prospective teachers at all levels clarify their views about studying history. A variety of pedagogical strategies for teaching history are explored.

HIST 371. Greek Civilization: From Helen of Troy to Alexander the Great 3 Credits (3)

This course provides a survey of Greek history from the Trojan War through the conquests of Alexander the Great. Topics include the formation of the Greek city-states with a focus on Sparta and Athens and the wars between them, the invention of democracy in Athens, the birth of the discipline of history, the development of philosophy, the trial and death of Socrates, and the spread of Greek culture to the borders of India because of the conquests of Alexander the Great. We will explore most aspects of Greek society, using Greek authors and artists to introduce much of the material. Attention is paid to the everyday life of ancient Greeks not just power politics. May be repeated up to 3 credits.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Greek history through a variety of primary sources, including works of literature and art.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 372. Roman Civilization 3 Credits (3)

In this course we will explore the growth of Rome from a village in the Italian peninsula to a global empire stretching from Spain to Syria and Britain to the sands of the Sahara. We will focus on the development of political, social, and cultural institutions in the construction of the Roman Republic and the enormous military conquests of that period. We then examine the transformation of the Republic into an empire, governed by an emperor. Finally, we analyze the rise of Christianity in the Roman world and the Roman empire's decline in the 5th century C.E. Attention is paid to the everyday life of ancient Romans not just power politics. May be repeated up to 3 credits.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Roman history through a variety of primary sources.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 373. Islam and the West: Cultural Contacts, Conflicts, and Exchanges 3 Credits (3)

This course examines interactions, encounters, and cross-fertilization between the Islamic world and the West from the 7th– 21st century. Topics include the relationship of Islam to Judaism and Christianity, the rise of an Islamic empire and the development of Islamic civilization, the Crusades, the impact of Islamic culture on Europe and the Italian Renaissance. It also explores the shifting relationships between Muslims, Christians, and Jews throughout this period.

Learning Outcomes

1. Student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the seventh to the early twenty-first century.
2. Students will be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West.
3. Students will critically read and evaluate historical evidence with the goal of forming an argument about historical evidence.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 374V. The European City: History and Culture 3 Credits (3)

Course presents the rich, complex history and cultures of European cities from ancient to modern times, linking these cities to crucial issues in European history. Crosslisted with HNRS 374V, GEOG 374V, POLS 374V.

HIST 379V. The History of Italy from the Etruscans to the Mafia 3 Credits (3)

Italy is beloved by many, for its food, language, and art; however, we often understand it only superficially, and often fail to grasp the darker elements of its history. This class will consider the history of the Italian peninsula from the time of its earliest inhabitants, the Etruscans, up through the twenty-first century. We will consider topics such as the Roman world and its legacy, the rise of Christianity, the growth of medieval towns and their economies, Renaissance, the Risorgimento or the formation of the modern nation of Italy, Italian fascism, the wars of the twentieth century, Italian film, the history of Italian food including pizza and pasta, Italian communism, and the growth of organized crime and the mafia. Special attention will be paid throughout to the relationship between Northern and Southern Italy, as well as the special city of Venice and its relationship to the rest of the peninsula.

Learning Outcomes

1. Master a general master narrative about the history of Italy from its earliest inhabitants through the twenty-first century
2. Identify a variety of developments in the history of Italian culture, including art, literature, food, and film;
3. Critically read and evaluate primary and secondary historical sources and
4. Communicate a historical argument logically and effectively in a 15-page original research paper.

HIST 382V. Modern Russia 3 Credits (3)

Domestic policies and foreign relations from mid-nineteenth century to the present with emphasis on the Soviet period.

HIST 383. Germany 3 Credits (3)

Political, social, and cultural developments from the eighteenth century to the present, with emphasis on the Nazi era. Same as POLS 473.

HIST 386. New Mexico History**3 Credits (3)**

Economic, political and social development of New Mexico from exploration to modern times.

HIST 387. Spain in the New World: Conquest, Conflict, and Cultural Exchange**3 Credits (3)**

The history of Spain, with a focus on Spain's interaction with the New World. May be repeated up to 3 credits.

Learning Outcomes

1. The student will be able to demonstrate a knowledge of the history of Spanish contacts, conquests, and influences in the New World from the late fifteenth century until the early twenty first century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Spain and the New World; Critically read and evaluate historical evidence in order to construct past events;
3. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 390V. The Holocaust**3 Credits (3)**

The attack upon European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession to chancellor in 1933 until the end of the Third Reich in 1945.

HIST 397. Introduction to Public History**3 Credits (3)**

Surveys how historians do history in museums, archives, government agencies, and in communities. Hands-on experience provides students a better understanding of history and how historians work outside of the classroom. Seminar project required.

HIST 398. Historians and History**3 Credits (3)**

General historiography and philosophy of history; historical methodology, research, and writing; bibliographical aids and their uses. May be repeated up to 3 credits. Restricted to: HIST majors.

HIST 400. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

HIST 402. Special Topics in European History**3 Credits (3)**

Special topics in European history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 403. Special Topics in Middle Eastern History**3 Credits (3)**

Special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 404. Special Topics in Asian History**3 Credits (3)**

Special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 406. Special Topics in United States History**3 Credits (3)**

Special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 413. Native American History**3 Credits (3)**

Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

HIST 414. The Constitution and U.S. History**3 Credits (3)**

This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a major project of historical synthesis at the end of the semester.

HIST 428. History of Terrorism in Modern Europe and the Middle East**3 Credits (3)**

Analyzes causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas and Hezbollah in the contemporary Middle East and beyond.

HIST 431. History of Race and Ethnicity**3 Credits (3)**

Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.

HIST 432. United States Labor History to 1877**3 Credits (3)**

Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

HIST 433. United States Labor History Since 1877**3 Credits (3)**

Seminar discussions explore United States labor and working-class history since 1877, including such topics as industrial labor, debt peonage, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state. May be repeated up to 3 credits.

HIST 434. Urban History**3 Credits (3)**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

HIST 435. History of War and Revolution**3 Credits (3)**

Seminar covers historical dynamics of violent social, political, and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 438. Antiquity and Modernity**3 Credits (3)**

Seminar explores links between earlier and more recent historical periods. Examples may include the Renaissance rediscovery of ancient Rome or the early modern Chinese reassessment of its classical Confucian heritage. Readings include ancient sources and the modern reception of such works, and the scholarly assessment of these processes. Individual research projects required in areas of student interests.

HIST 443. The Cold War in Latin America**3 Credits (3)**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

HIST 448. Nuclear Nation**3 Credits (3)**

Explores post-World War II history and the impact atomic energy has had on the United States and the world.

HIST 449. Readings**1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

HIST 453. Cuba: Colony to Castro**3 Credits (3)**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean with emphasis on recent events.

HIST 471. China through the Ming Dynasty**3 Credits (3)**

History of China from origins to Ming dynasty, (1368-1644). Cultural and political development with emphasis on social and economic contexts and long term trends.

HIST 472. China in the Modern World**3 Credits (3)**

History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.

Learning Outcomes

1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations.
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 473. History of Japan**3 Credits (3)**

History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.

HIST 474. Gender in East Asian History**3 Credits (3)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as GNDR 474.

HIST 475. History of the Global Political Economy**3 Credits (3)**

Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 478. History of Transportation: Planes, Trains and Automobiles**3 Credits (3)**

The course examines the impact of changes in transportation technology on society from the 19th century to the present, with a focus on the Americas, both the United States and Latin America. Revolutionary changes such as the railroad, the steamship, and later the automobile and the airplane changed the way that people lived, worked and interacted with others.

Learning Outcomes

1. Analyze primary sources by placing them into historical context.
2. Improve writing skills using Chicago style of writing.
3. Explain the nature of technological change in history and its impact in society.
4. Relate historical events to current-day debates about transportation.
5. Practice team-work through Team Based Learning method.

HIST 479. Oral History**3 Credits (3)**

Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.

HIST 483. Historic Preservation**3 Credits (3)**

Study of community development, the historic preservation movement, and the built environment. Field project.

HIST 486. Interpreting Historic Places for the Public**3 Credits (3)**

Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

HIST 489. Projects in History**3 Credits (3)**

Individual projects in history. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

HIST 500. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated for a maximum of 12 credits.

HIST 504. Civil War Era, 1840-1877**3 Credits (3)**

Mexican-American War, development of secession, American Civil War, Reconstruction. Graduate research paper required.

HIST 511. Making the American West**3 Credits (3)**

Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.

HIST 514. The Constitution and U.S. History**3 Credits (3)**

This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a 10-12 page research paper in which they will integrate and extend learned material.

HIST 523. The History of Food**3 Credits (3)**

Considers the history of the production and consumption of food in the West from the Neolithic Age to the present with an emphasis on the historical relationships between food, gender, social class, social identity and nationalism.

HIST 527. Labor History**3 Credits (3)**

Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

HIST 528. History of Terrorism in Modern Europe and the Middle East**3 Credits (3)**

Advanced analyses of causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas, and Hezbollah in the contemporary Middle East and beyond.

HIST 535. War and Revolution**3 Credits (3)**

Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 538. Special Topics in European History**3 Credits (3)**

Advanced special topics in European history to be announced in the schedule of classes. May be repeated for a maximum of 12 credits.

HIST 540. Special Topics in Middle Eastern History**3 Credits (3)**

Advanced special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 543. Special Topics in Asian History**3 Credits (3)**

Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 545. Special Topics in United States History**3 Credits (3)**

Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 548. Nuclear Nation**3 Credits (3)**

Explores post-World War II history and the impact that atomic energy has had on the United States and the world.

HIST 549. Graduate Readings**1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

HIST 553. Cuba: Colony to Castro**3 Credits (3)**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean, with emphasis on recent events. Graduate research paper required.

HIST 557. The Mexican Revolution**3 Credits (3)**

Origins, causes, and scope of the Mexican Revolution, including leading personalities, with emphasis on the U.S.-Mexican border. Graduate research paper required.

HIST 566. British Imperialism**3 Credits (3)**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

HIST 568. Urban History**3 Credits (3)**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

HIST 570. The Cold War in Latin America**3 Credits (3)**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

HIST 571. China through the Ming Dynasty**3 Credits (3)**

History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.

HIST 572. China in the Modern World**3 Credits (3)**

Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 573. History of Japan**3 Credits (3)**

Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.

HIST 574. Gender in East Asian History**3 Credits (3+2P)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature (in translation) and cinema used. Same as GNDR 574.

HIST 575. History of the Global Political Economy**3 Credits (3)**

Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 578. Modern Russia**3 Credits (3)**

Domestic policies and international relations from the mid-nineteenth century to the present with emphasis on the Soviet experience.

HIST 579. Oral History**3 Credits (3)**

Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.

HIST 580. Graduate Research Projects**1-6 Credits (1-6)**

Intensive investigation of a selected area of history, including the completion of a research paper or a public history project. Consent of instructor required.

HIST 583. Advanced Historic Preservation**3 Credits (3)**

Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.

HIST 585. Public History Internship**3 Credits (3)**

Individual project in an area of public history, including a final written report. Research project required. May be repeated for a maximum of 9 credits.

Prerequisite: consent of instructor.

HIST 586. Interpreting Historic Places for the Public**3 Credits (3)**

Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

HIST 590. Reading Seminar: Borders, Boundaries and Frontiers**3 Credits (3)**

Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program.

HIST 591. Reading Seminar: Modernity and its Discontents**3 Credits (3)**

Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.

HIST 592. Reading Seminar: Nature and Society**3 Credits (3)**

Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.

HIST 593. Reading Seminar: History, Myth and Memory**3 Credits (3)**

Course analyzes the complex and often contested process of writing national histories, creating national heroes, and forging collective memories. Students assess written texts, memorials, parades and celebrations.

HIST 594. Public History Seminar

3 Credits (3)

Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.

HIST 596. Research Seminar

3 Credits (3)

Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.

HIST 597. Public History Article

1-9 Credits (1-9)

Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.

HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f)

3 Credits (3)

Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.

HIST 599. Master's Thesis

1-15 Credits (1-15)

Thesis.

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Phone: (575) 646-4601

Website: <http://history.nmsu.edu/> (<http://history.nmsu.edu>)

History - Bachelor of Arts

The undergraduate history major consists of at least 36 credits in the major field, 21 credits of which must be numbered 300 or above. All courses must be passed with grades of C- or higher, and none may be taken on an S/U basis. Electives must be carefully selected by the student and approved by a Department of History advisor so that the student's program is well tailored to individual goals. All majors must be advised prior to registration.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
Area II: Mathematics ^{1,2}		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Sciences (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course ¹		

Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 credits or 3 credits) ¹	
Area V: Humanities	
Choose one HIST course from the following to satisfy the Area V requirement and another one to satisfy the General Education elective requirement:	3
HIST 1105G	Making History
HIST 1130G	World History I
HIST 1140G	World History II
HIST 1150G	Western Civilization I
HIST 1160G	Western Civilization II
HIST 1110G	United States History I
HIST 1120G	United States History II
HIST 2245G	Islamic Civilization to 1500
HIST 2246G	Islamic Civilizations since 1800
HIST 2250G	East Asia to 1600
HIST 2251G	East Asia since 1600
Area VI: Creative and Fine Arts ¹	
General Education Elective	
Viewing A Wider World ³	
Departmental/College Requirements	
A total of 15 credits of lower-division HIST courses are required.	15
HIST 1105G	Making History
HIST 1150G	Western Civilization I
HIST 1160G	Western Civilization II
HIST 1130G	World History I
HIST 1140G	World History II
HIST 1110G	United States History I
HIST 1120G	United States History II
HIST 2250G	East Asia to 1600
HIST 2251G	East Asia since 1600
HIST 2245G	Islamic Civilization to 1500
HIST 2246G	Islamic Civilizations since 1800
HIST 311V	Colonial Latin America
HIST 312V	Modern Latin America
Required Course	
Students should take HIST 398 in their Junior year, if possible.	
HIST 398	Historians and History ⁵
Select at least 18 credits of upper-division courses, excluding HIST 398. At least 6 credits of upper-division courses must be at the 400 or above level. ⁵	3
Second Language Requirement: (not required)	
Electives, to bring the total credits to 120	
Select sufficient electives to bring total credits to 120, including 48 upper-division credits. ⁶	44-46
Total Credits	120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students who complete their Humanities General Education requirements with courses outside of the HIST prefix will need to take an additional 6 credits of lower-division HIST, in order to complete the requirement with a total of 12 credits

⁵ **Majors must pass a total of 21 upper division History credits** (including HIST 398 Historians and History) with at least 6 at the 400 level.

HIST 311V Colonial Latin America and HIST 312V Modern Latin America cannot be counted towards this requirement.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in History there is no second language requirement for the degree.

Secondary Licensure

History majors who are planning on pursuing certification as public school teachers should take the following six courses in preparation. These six courses will complete approximately half of the course work necessary for students to earn teaching licensure in New Mexico. After completing the undergraduate degree in History with a grade point average of 2.5 or above, the student should apply to the Graduate School for admission to the Department of Curriculum and Instruction and the Teacher Education Program in the College of Education to pursue the remaining courses needed to complete secondary licensure.

Prefix	Title	Credits
Required Courses		
EDUC 3120	Multicultural Education	3
EDLT 3110	Integrating Technology with Teaching	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
EDUC 3997	Secondary Field Experience	0,3
EDUC 5110	Exploration in Education ¹	3
Total Credits		12-15

¹ Recommended for senior year or as a graduate student.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Prefix	Title	Credits
Freshman		
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
FYEX 1112	The Freshman Year Experience	3
General Education HIST Elective Course		3
Area IV: Social and Behavioral Science Course ²		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
General Education HIST Elective Course ²		3
HIST Elective Course		3
Area VI: Creative and Fine Arts Course ²		3

Minor (or Elective) Course		3
Credits		31
Sophomore		
ENGL 2221G	Writing in the Humanities and Social Science ¹	3
Area III: Laboratory Science Course ²		4
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course ²		3-4
HIST Elective Courses		9
Minor (or Elective) Course		6
Elective Course(s)		6
Credits		31-32
Junior		
HIST 398	Historians and History	3
HIST Upper-Division Elective Course		9
VWW: Viewing a Wider World Course ³		3
Upper-Division Minor (or Elective) Course		6
Upper-Division Elective Course		6
Elective Course(s)		3
Credits		30
Senior		
VWW: Viewing a Wider World Course ³		3
HIST 400-Level or Above Elective Course		6
HIST Upper-Division Elective Course		6
Upper-Division Elective Course		6
Elective Course(s)		7
Credits		28
Total Credits		120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

History - Undergraduate Minor

A student may not earn both a bachelor's degree in the Department of History and a minor in History.

Prefix	Title	Credits
Requirements		
Select two from the following:		6
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
HIST 2245G	Islamic Civilization to 1500	
HIST 2246G	Islamic Civilizations since 1800	
Select 12 additional credits in History (at least 9 credits must be numbered 300 and above)		12
Total Credits		18

Note: All courses must be passed with grades of C- or above. No courses may be taken S/U.

Journalism and Media Studies

Undergraduate Program Information

Studies in Journalism and Media Studies prepare students for careers in mass media, including news/editorial (print and online), broadcasting, advertising, public relations and photojournalism. Students study these disciplines and learn the trends and changes in the industry, such as how they converge on the internet. The curriculum emphasizes the skills of gathering, evaluating, writing and disseminating information and related skills. Students also are instructed in the theory, law, history and professional guidelines of mass media.

Degrees for the Department

- Journalism and Media Studies - Bachelor of Arts (p. 704)
- Journalism and Media Studies - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/journalism-media-studies-ba-online/>)

Minors for the Department

- Journalism and Media Studies - Undergraduate Minor (p. 709)
- Social Media Management - Undergraduate Minor (p. 709)
- Strategic Communications - Undergraduate Minor (p. 709)

Interim Department Head: Lanasa

Professor Lamonica; **Associate Professors** Berman; **Assistant Professors** Park; **College Associate Professors** Miller; **College Assistant Professors** Perez, Phillips; **Professor Emeritus** McCleneghan, Mellen, Thayer; **News22 Director** Miller; **Spanish News22 Director** Perez

Journalism and Media Studies Courses

JOUR 105G. Media and Society 3 Credits (3)

Functions and organization of the mass media system in the United States; power of the mass media to affect knowledge, opinions, and social values; and the impact of new technologies.

JOUR 110. Media Writing I 3 Credits (2+2P)

Introduction to media writing basics including news writing for print and web, feature writing, sports writing and writing for public relations. Course emphasizes fundamental news values, journalism ethics and Associated Press style. Restricted to all Campuses. May be repeated up to 3 credits.

Learning Outcomes

1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews, attributions and cutlines.
2. Know how to cover scheduled and breaking news events, and put knowledge into practice.
3. Know how to write for different media, including print, web and broadcast, and put knowledge into practice.
4. Know fundamentals of writing news stories, features, editorials, obituaries, and press releases, and put knowledge of each into practice.
5. Develop and practice basic copy editing skills.

JOUR 201. Introduction to Multimedia Journalism 3 Credits (2+2P)

Introduction to journalistic storytelling using text, photos, audio, video and infographics. Students produce their own multimedia stories in intensive, hands-on environment using digital cameras and audio recorders, mobile phones, external microphones and digital editing software applications including Adobe Premiere Pro, Audition and Photoshop. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how to recognize and accurately define multimedia journalism.
2. Improve visual literacy by viewing and analyzing a variety of work produced by professional multimedia journalists.
3. Know the basic requirements and parts of a story, and know how to map and structure a story.
4. Know and put into practice news writing basics including the five W's.
5. Know what makes a good image, and put into practice composing and framing photographs and videos.
6. Understand and put into practice still photography, video and audio capture and editing fundamentals using a variety of tools.
7. Know how to combine different media to create a logical and effective story.

JOUR 210. Copyediting 3 Credits (2+2P)

Introduction to various aspects of copyediting with an emphasis on accuracy and style. Includes hands-on, directed practice in editing for Associated Press style, punctuation and grammar. Includes headline and cutline writing. May be repeated up to 3 credits.

Prerequisite: JOUR 110.

Learning Outcomes

1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews and attributions.
2. Know fundamentals of writing news stories, sports stories, features and editorials, and put knowledge of each into practice.
3. Know how to write for different media, including print, web and social media, and put knowledge into practice.
4. Develop and practice basic copy editing skills.
5. Understand fundamentals of media law and ethics, and know basic press rights.
6. Understand basic math principles used by reporters.
7. Practice and understand the importance of meeting deadlines.
8. Develop a habit of consuming news and monitoring daily headlines.

JOUR 300. Introduction to Advertising 3 Credits (3)

Role of IMC (integrated marketing communications) in marketing of goods, services, and organizations. Creative process, strategic planning media, message design, consumer behavior, and social issues of IMC.

JOUR 302. Television Videography & Editing**3 Credits (3)**

Classroom instruction on basic studio and single camera video productions. The focus is placed on introductory practical aspects of news and videography, reporting and storytelling. Lab experience in camera basics, studio functions and digital video editing. Includes practical experience through crew assignments on the live student-produced newscast, News22, which airs on KRWG-TV, a PBS affiliate station. May be repeated up to 3 credits.

Learning Outcomes

1. The students will be able to have a broader introductory understanding of video production for broadcasting media
2. The students will be able to edit video and digital production
3. The students will be able to create media reporting for News and Sports

JOUR 305. Visual Communication in Media**3 Credits (3)**

How one sees, perceives, interprets, creates and applies visual language. Explores the history, techniques, application and practice of the various visual media. May be repeated up to 3 credits.

Learning Outcomes

1. Give students an understanding of the historical, critical, theoretical and practical aspects of visual culture in digital media era.
2. Sharpen students' visual acuity
3. Enhance students' understanding of point of view
4. Help students to broaden their perspective of visual communication from the storytelling perspective in social and digital media
5. Enlarge students appreciation of visual culture

JOUR 306. Sports Writing and Reporting**3 Credits (3)**

Fundamental principles of sports writing and reporting with an emphasis on accuracy and style. Includes a mix of classroom instruction and hands-on, directed practice in game coverage sports feature writing, sports commentary and sports statistics. Students have the opportunity to produce sports content for Kokopelli online news outlet. May be repeated up to 6 credits.

Prerequisite: JOUR 210 or consent of instructor.

Learning Outcomes

1. Know how to recognize and accurately define sports journalism and different sports story types
2. Improve sports journalism literacy by reading, viewing and analyzing a variety of work produced by professional sports writers and reporters
3. Know the basic parts of a sports story, and know how to structure and package various types of sports stories
4. Know and put into practice sports writing basics including the five W's, leads, interviews, quotations and attributions
5. Know how to write sports stories for different media, including print, web and social media, and put knowledge into practice
6. Know basic sports terminology, and know how to compile, compute and interpret a wide variety of sports statistics

JOUR 310. Media Writing II**3 Credits (3)**

Field reporting and writing for web and print publication. Includes a mix of classroom instruction and hands-on, directed practice in local news and sports reporting, feature writing, opinion writing and social media content creation. Students produce written and visual content for Kokopelli online news outlet. Course emphasizes accuracy, news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits. May be repeated up to 3 credits.

Prerequisite: JOUR 210.

Learning Outcomes

1. Write an inverted pyramid on deadline.
2. Use AP style in all written assignments.
3. Incorporate news writing conventions in all stories.
4. Identify the differences between hard news stories and features.
5. Conduct interviews using best journalistic practices and professionalism.
6. Demonstrate news judgment in pitching, reporting, and writing stories.
7. Build a personal website and use digital media to report, publish and promote stories.
8. Understand basic libel law and journalistic ethics.

JOUR 312. Advertising/Copywriting**3 Credits (3)**

Creative process, strategic thinking, and principles of advertising in execution of copy, storyboards, and layouts for clients.

Prerequisite(s): JOUR 110 or consent.

JOUR 314. Broadcast Reporting**3 Credits (3)**

Students learn the techniques of reporting and writing news stories for broadcast, including how to incorporate video and natural sound so all elements work together for good storytelling. May be repeated up to 3 credits.

Prerequisite: JOUR 302.

Learning Outcomes

1. Students will learn the basics of television reporting.
2. Students will learn and practice the skills of broadcast news reporting, especially, broadcast writing, reporting, interviewing, videography and audio recording, editing, and how to tell stories with video and audio.

JOUR 315. News 22**1-3 Credits (1-3)**

Students will report news stories for live, student-produced television newscast that airs on KRWG-TV, public television for Southern New Mexico. May be repeated up to 3 credits.

Prerequisite: JOUR 314 or JOUR 330.

Learning Outcomes

1. Students will learn to report professional news stories for News twenty-two
2. Students will learn the fundamentals of live broadcast news production.

JOUR 319. Intro Photography**3 Credits (3)**

Introduction to photography emphasizing composition, camera techniques, post-production skills in Photoshop, Lightroom, and InDesign and storytelling skills. History of photography overview. This class is the starting point for students interested in a photojournalism emphasis. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to use "visual language" for use across multiple platforms including print, video and web.
2. Students will acquire post-production skills used in various industries.
3. Students will be able to produce powerful and effective communication through image-making.

JOUR 320. Photojournalism**3 Credits (3)**

Communication photography on multiple platforms for sports, news, advertising/public relations and other editorial and commercial needs. Photography lighting techniques, photo-editing software, and website skills will be expanded and further developed. May be repeated up to 3 credits.

Prerequisite: JOUR 319 or Consent of instructor.

Learning Outcomes

1. Students will be able to use specialty techniques, especially sports photography and studio/portraiture/product photography.
2. Students will expand skills needed in editorial, advertising and other communication industries.

JOUR 321. Media Graphic Design**3 Credits (3)**

Introduction to graphic design fundamentals for print and web publication including page layout, typography, color theory and photo editing. Students produce their own print and web-based design pieces using Adobe InDesign and Photoshop. May be repeated up to 3 credits.

Learning Outcomes

1. Know and put into practice fundamental design principles including proximity, alignment, repetition and contrast.
2. Know fundamentals of color theory and typography, and apply this knowledge to a variety of media design projects.
3. Know fundamental rules of photography composition and cropping.
4. Know fundamental rules and principles of printed newspaper and magazine design and put knowledge into practice.
5. Know fundamental rules and principles of printed newsletter and brochure design and put knowledge into practice.

JOUR 330. TV News Shooting & Editing**3 Credits (2+4P)**

Advanced technical and aesthetic skills and journalism basics needed for videography and editing on-location news stories. Single camera videography and nonlinear/digital editing. May be repeated up to 3 credits.

Prerequisite: JOUR 314 or permission of instructor.

Learning Outcomes

1. Learn or continue exploring and mastering the concept of video sequencing in the field, gathering great natural sound, opening and closing shots and improve your overall storytelling process in the field and during the edit process.
2. Learn or continue exploring the fundamentals of non-linear digital editing, using Adobe Premier.
3. Expand knowledge of field sound recording.
4. Learn and distinguish the difference between uncontrolled action and controlled action.

JOUR 350V. Media History**3 Credits (3)**

Historical overview of media including newspapers, magazines, radio, television, photography, entertainment media, advertising, public relations, and digital media. The history of American media development is directly intertwined with American history. Newspapers, magazines, television, and radio have not just reported on news and events; by virtue of what facts and sources editors and reporters have chosen to use, journalists have framed how the public should think about events. Editorials also provided further framing guidance on issues to readers and viewers. Students will study media history from social, intellectual, and cultural history perspectives. Students will examine the historical relationship of the media to American social, political, economic, and cultural patterns and developments. And, conversely, students will examine how these same forces impacted and changed all forms of media through a multi-cultural approach. May be repeated up to 3 credits.

Learning Outcomes

1. Survey the development of various forms of media and the changes in the media as they relate to the larger social, economic, and political sphere
2. Learn the methods and processes of historical research and engage in historical research.
3. Learn that the development of all fields of communication are interrelated
4. Discover how American media have attempted to influence how Americans perceive the world around them (including perceptions of other nations) via their coverage and portrayal of global events.
5. Learn that America's historical events played out through the media. As such, students will gain a deeper understanding of how media personnel helped "frame" the discussion and debate about news and information from the 1600s to present day
6. Discover that the ethical and professional foundations of media industries have adjusted and changed over time due to external and internal forces, including the rise of the professionalism movement across the nation in the late nineteenth century, the internal response to public demands for licensing of news media following World War I, and modern pressures caused by digitization of the industry and the parallel fragmentation of audiences
7. Learn how to determine how various groups outside the mainstream contributed to overall press development. This includes an examination of how women and ethnic minorities influenced how and why the press became a force for social, cultural, political, and economic change in society.
8. Discover and appreciate that history is NOT just the study of names, dates, and places, but of people
9. Discover that the history of media is not the province of any one individual, corporation, or entity. Instead, a variety of factors: social, economic, political, legal, ethical, and cultural, helped shape the media's development

JOUR 360. Media Literacy**3 Credits (3)**

This course is designed to help students develop an informed, critical, and practical understanding of media including analysis of online and social media and to help students develop their media literacy and analytical skills.

Learning Outcomes

1. Write clearly, precisely, and in a well-organized manner.
2. Demonstrate critical thinking, reading, and viewing skills.
3. Research, develop, evaluate, and present arguments grounded in research-based knowledge.
4. Apply analytical, precise, and elaborated terms and concepts for talking and writing about media and the ways in which they communicate meaning.
5. Demonstrate how images are constructed via specific formal and technical elements and how those images construct meaning about national and global communities.
6. Interpret media texts (film, television, etc.) to expand experience and understanding of the self and society.

JOUR 374. Introduction to Public Relations**3 Credits (3)**

This course is designed to familiarize students with the basic concepts, principles, practices, and professions of public relations (PR). It is the foundation course for other PR courses in Journalism and a supplemental course for students majoring in other fields.

Learning Outcomes

1. The role and functions of public relations in contemporary society.
2. The contingency views of public relations practice in the worlds of managing competition and conflict.
3. The historical evolution of public relations, career opportunities in the field, and professional/ethical/legal responsibilities.
4. The basic process of public relations—research, planning, communication, evaluation—and the use of communications strategies and tactics to achieve organizational goals and objectives.
5. The persuasion of public opinion and audience analyses and how to reach diverse audiences.
6. Practical guidelines for utilizing written, spoken, and visual techniques to reach selected audiences.
7. An understanding of how public relations is a global phenomenon.
8. How the Internet and social media are changing the way public relations professionals build and sustain relationships between an organization and its constituents.
9. An understanding of public relations activities in business, sports, tourism, entertainment, nonprofit, education, and government organizations.

JOUR 377V. Mass Media Ethics**3 Credits (3)**

Philosophical and moral examination of problems relating to mass media. Use of case study method to analyze media situations; development of framework for media professionalism.

JOUR 380. Women and the Media**3 Credits (3)**

Portrayal and participation of women in mass media from colonial to contemporary times. Same as GNDR 450. May be repeated up to 3 credits.

JOUR 384. Public Relations Storytelling**3 Credits (3)**

This course will help students understand the concept of using storytelling as a tool for public relations, branding, and social change. Students will learn how to use storytelling on traditional and social media platforms. Upon completion of this course, students should have attained knowledge of essential elements of storytelling, audience-led narratives, transmedia storytelling, etc.

Learning Outcomes

1. Students will attain knowledge and understanding of the essential elements of branding through storytelling.
2. Students will attain knowledge and understanding of the assessment of brand stories and customer-led narratives.
3. Students will attain knowledge and understanding of integrating brand storytelling into the marketing mix.
4. Students will attain knowledge and understanding of data-driven storytelling.
5. Students will attain knowledge and understanding of personal branding of leaders and brand storytelling success.
6. Students will attain knowledge and understanding of research skills for brand storytelling.
7. Students will attain knowledge and understanding of the future of brand storytelling.

JOUR 407. Media Internship**1-3 Credits (1-3)**

Supervised work with a media organization. 1-3 credits. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: JOUR majors.

Prerequisite(s): Consent of internship coordinator.

JOUR 408. Media Practicum**1-3 Credits**

Advanced supervised work with a media organization. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of internship coordinator.

JOUR 412. Documentary Photojournalism**3 Credits (3)**

Production of documentary photography for web, print, broadcasting and exhibition emphasizing deep visual storytelling. Multimedia, social media distribution and website techniques including WordPress website design and maintenance. Discussion of notable photographers. Multiple Field Trips to produce material for the Small Village New Mexico term project (SVNM). Students produce an individual Term Project book and multimedia show. May be repeated up to 3 credits.

Prerequisite: JOUR 319.

Learning Outcomes

1. Students will learn "slow photojournalism," and be able to produce visual stories done with deep immersion in whatever community or subject they work in.
2. Students will be able to use photography for communication, giving deeper meaning to subjects than transitory "news" type photography allows.

JOUR 414. Broadcast Reporting Portfolio**3 Credits (3)**

This course is designed to help students who are preparing for a career in broadcasting. Students will refine reporting, shooting and editing skills and build a professional website containing a reporter reel, resume and proof of other skills needed for success in broadcasting. The class also features guest speakers throughout the semester who work in the broadcast and digital world of media. May be repeated up to 3 credits.

Prerequisite: JOUR 314.

Learning Outcomes

1. To practice, hone, and improve scriptwriting skills, especially news writing.
2. To practice and improve audio announcing skills and on-camera announcing skills.
3. To practice and improve overall videography and digital editing skills.
4. To learn more and prepare for related careers.

JOUR 425. Media Planning and Buying**3 Credits (3)**

Covers the principles of media planning for an IMC campaign and procedures for purchasing ad time or space.

Prerequisite(s): JOUR 300 or consent of instructor.

JOUR 427. Media Writing III**3 Credits (3)**

Advanced field reporting and writing for web and print publication. Includes hands-on, directed practice in local news and sports reporting, feature writing, opinion writing, social media content creation and web publishing. Students produce written and visual content for Kokopelli online news outlet, and prepare final portfolio. Course emphasizes accuracy news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits.

Prerequisite: JOUR 310.

Learning Outcomes

1. Sharpen and expand advanced reporting, interviewing, writing, and editing skills for print and online publication.
2. Sharpen multimedia reporting and storytelling skills including photography skills.
3. Improve and expand professional portfolio through online publication of original work.
4. Demonstrate effective use of social media platforms.
5. Demonstrate understanding of fundamentals of journalism ethics.
6. Learn to work effectively under deadline pressure.
7. Produce a final portfolio or "string book" of published work.

JOUR 457. Social Media Management and Analytics**3 Credits (3)**

This course is designed to help students to understand how marketing has (and has not) changed due to the rise of social media and changes in various underlying contextual factors, such as dramatically increased speed of information dissemination across consumers and brands. The overarching goal is to obtain a clear perspective on what's really going on in digital/social/mobile marketing so that you can begin to appreciate its true value to consumers, to managers, and to other corporate stakeholders. It will equip students with the relevant knowledge, perspectives, and practical skills required to develop marketing strategies that leverage the opportunities inherent in social media and consumer-to-consumer social interactions for achieving business and marketing goals.

Prerequisite: JOUR 374.

Learning Outcomes

1. Understand what social media is and how this new type of media and communications technology influences how business and marketing is done
2. Develop skill in using the predominant social media tools currently available for business/marketing communication
3. Understand how to use various social media channels to publish and disseminate relevant branded content in order to engage consumers and to increase social impact, influence, and value
4. Develop a strategic plan for identifying opportunities for using social media in a company

JOUR 460V. Sports & Entertainment P.R.**3 Credits (3)**

This course aims to provide a basic understanding of sports and entertainment PR and its industry trends, theories, techniques, case studies, global trends, and future directions. Upon completion of this course, students will be able to use the theories and techniques to plan, implement, and evaluate sports and entertainment PR campaigns and activities. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the nature of public relations practice in sports
2. Practice the primary research methods employed in sports public relations.
3. Recognize the major steps involved in planning a public relations campaign and the key considerations at each step in the process.
4. Identify the various types of paid/earned/shared/owned media commonly utilized in the profession
5. Comprehend the different tactics used to generate publicity.
6. Become proficient in writing news releases.
7. Distinguish among the various response strategies sports managers may employ in a crisis.
8. Describe unique aspects of social responsibility in the sports and entertainment industry
9. Identify legal issues in sports PR, anticipate emerging ethical issues, evaluate ethical dilemmas present in sports PR, and recognize the need for ethical decision-making in sports PR. 1
10. Describe current global trends and multicultural issues, which have impacted the global sports and entertainment industry.

JOUR 463. Public Relations for Social Impact**3 Credits (3)**

This course aims to provide a basic understanding of the role of PR in influencing public behavior and creating positive social impact. This course offers different approaches to solving a range of social problems in the areas of health, safety, environmental protection, and community involvement.

Learning Outcomes

1. Apply social marketing theories for developing, implementing, and evaluating social marketing campaigns
2. Utilize nudge techniques to improve decisions about health, wealth, and happiness in both personal and societal levels
3. Prepare a prosocial campaign plan using social media and public relations strategies
4. Identify examples of successful social marketing campaigns

JOUR 470. Environmental, Social, & Governance Public Relations**3 Credits (3)**

This course will explore how organizations create values by investigating the concept of environmental, social, and governance (ESG) and social responsibility campaigns in the light of public relations. Students will learn about philanthropy, sustainability, reputation building, and ESG for the media and entertainment industry.

Learning Outcomes

1. Understand the basic concepts and elements of Strategic Corporate Social Responsibility (Strategic CSR).
2. Understand company's value-creating activities through strategic CSR.
3. Understand company's CSR strategy under the context of economical and social exchanges
4. Understand the process of creating comprehensive strategic CSR communications plan

JOUR 476. Advertising & Public Relations Campaigns**3 Credits (3)**

In this capstone course, students will utilize the principles and techniques of advertising and public relations to research and develop a comprehensive campaign plan. Students will develop a portfolio to demonstrate their skills to prospective employers. Restricted to Journalism and Media Studies Majors. May be repeated up to 3 credits.

Prerequisite: JOUR 374.

Learning Outcomes

1. Students will independently work on two projects to practice how to promote themselves and develop a professional point of view.
2. Students will create a portfolio at the end of the course that can be used to help demonstrate their skills to prospective employers.
3. Students' projects will demonstrate that they understand how to utilize the principles and techniques of advertising and PR to research and develop a comprehensive campaign plan.

JOUR 489. Media Research**3 Credits (3)**

Examination of the role of empirical research in solving mass communication problems. Survey techniques, field studies, content analysis, data analysis. May be repeated up to 3 credits.

JOUR 490. IMC Campaign**3 Credits (3)**

Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local IMC (Integrated Marketing Communications) campaign. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): JOUR 300 and 312 or consent of instructor.

Learning Outcomes

1. Students will learn how to create IMC campaign for client or for brands, and will be able to apply this for the real world when they apply for job.

JOUR 493. Media Law**3 Credits (3)**

Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, POLS 493. May be repeated up to 3 credits.

JOUR 494. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes.

JOUR 495. Media Theory**3 Credits (3)**

Theoretical approaches to media communications. Examination of media effects, audiences, and media socialization May be repeated up to 3 credits.

JOUR 499. Independent Study in Media**1-3 Credits**

Individual study directed by consenting instructor with prior approval of department head. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): 2.5 GPA and consent of instructor.

JOUR 501. Global Strategic Communications: Cultural Perspective**3 Credits (3)**

This course is set up to combine both theory and practice, regarding global communications, especiall from cultural perspectives. Also, this course is designed for students to understand persuasive strategic communications in different nations. Markets are no longer bound with their physical locations because of the communication technologies. To successfully address the strategic communications in global market, marketers and advertisers need to fully understand "local" challenges coming "deep" from cultural, economic, regulatory and competitive differences. Based on theoretical and practical understanding of the dynamic interplay between global and local forces, students will acquire theoretical as well as practical understandings of how to accomplish the goals of strategic communications in global markets. Thus, the core objective of this class is to develop an ability to analyze and map out persuasive communication strategies that are effective in global markets.

Learning Outcomes

1. Know how to analyze cultural norms and recognize strategic communications practices that are congruent to such cultural norms.
2. Identify similarities and differences in different consumer segments according to dimensions of culture.
3. Develop a deeper understanding of cultural dimensions.
4. Implement effective market research applications in different regions of the world.
5. Conceptualize and operationalize theoretical frameworks.

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Journalism and Media Studies - Bachelor of Arts

Below are the requirements for completing the Bachelor of Arts with a major in Journalism and Media Studies without a specific area of focus. For information on how to complete the program with either an advertising, broadcasting, or Multimedia/Photojournalist focus, please see the roadmaps tab. (p. 706)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics ¹</i>		
MATH 1130G	Survey of Mathematics (Recommended)	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
JOUR 105G	Media and Society (Core Requirement)	10
<i>Area III: Laboratory Science Course (4 credits) ¹</i>		
Choose One More Class from Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective ¹</i>		3
Viewing a Wider World Courses ²		6
Departmental/College Requirements		
<i>Core Requirements</i>		
Lower-Division:		
JOUR 110	Media Writing I	3
JOUR 201	Introduction to Multimedia Journalism	3
JOUR 210	Copyediting	3

Upper-Division:

JOUR 300	Introduction to Advertising	3
JOUR 302	Television Videography & Editing	3
JOUR 319	Intro Photography	3
JOUR 321	Media Graphic Design	3
JOUR 374	Introduction to Public Relations	3
JOUR 493	Media Law	3

Advanced Requirements⁴**Introductory Professional Courses⁵** 3-9

JOUR 310	Media Writing II	
JOUR 407	Media Internship	
JOUR 408	Media Practicum	

Intermediate Professional Courses 3-6

JOUR 306	Sports Writing and Reporting	
JOUR 312	Advertising/Copywriting	
JOUR 314	Broadcast Reporting	
JOUR 315	News 22	
JOUR 320	Photojournalism	
JOUR 330	TV News Shooting & Editing	
JOUR 384	Public Relations Storytelling	
JOUR 425	Media Planning and Buying	

Advanced/ Capstone Professional Courses 3-6

JOUR 412	Documentary Photojournalism	
JOUR 414	Broadcast Reporting Portfolio	
JOUR 427	Media Writing III	
JOUR 476	Advertising & Public Relations Campaigns	
JOUR 490	IMC Campaign	

Media Courses⁶ 3

JOUR 350	Media History	
JOUR 377V	Mass Media Ethics	
JOUR 380	Women and the Media	
JOUR 457	Social Media Management and Analytics	
JOUR 460	Sports & Entertainment P.R.	
JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 489	Media Research	
JOUR 494	Special Topics	
JOUR 495	Media Theory	
JOUR 499	Independent Study in Media	

Second Language Requirement: (required- see below) 4-8**Electives, to bring the total credits to 120⁷** 23-39

15 credits must be Upper Division

Total Credits 120¹ See the General Education (p. 220) section of the catalog for a full list of courses² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses³ Students must complete 27 credits of non-core courses, including at least one course from each category listed above, introductory professional course, intermedia professional course, capstone course, and media course. Number of credits listed next to each category is recommended, not required. Entry into courses is subject to successful completion of appropriate prerequisites.⁴ All introductory classes, except JOUR 310 Media Writing II and JOUR 374 Introduction to Public Relations, do not require any prerequisite class to get into these classes. Students must successfully finish JOUR 210 Copyediting to get into JOUR 310

Media Writing II and JOUR 110 Media Writing I to get into JOUR 374 Introduction to Public Relations.

⁵ Students should take at least one class from media courses. For Ad/PR students, JOUR 457 Social Media Management and Analytics, JOUR 470 Environmental, Social, & Governance Public Relations and JOUR 489 Media Research are recommended.⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.**Second Language Requirement**

For the Bachelor of Arts in Journalism and Media Studies there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		

PORT 1120	Portuguese II
or SPAN 1220	Spanish for Heritage Learners II
or SPAN 2210	Spanish for Heritage Learners III

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Below are the roadmaps for the Bachelor of Arts with a Major in Journalism and Media Studies, the department has four focus areas that students can follow to complete their degree in an area of study that benefits them: a general journalism and media studies, advertising, broadcasting and multimedia/photojournalism focuses. ***These are not considered official concentrations and will not appear on a student's transcript or within their student record.***

General Focus

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course ¹		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better - will count for Gen. Ed requirement)	3
Area V: Humanities Course ¹		3
JOUR 110	Media Writing I	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ¹		4
Area IV: Social/Behavioral Sciences Course ¹		3
JOUR 210	Copyediting	3

3	JOUR 201	Introduction to Multimedia Journalism	3
Credits			32-33
Sophomore			
JOUR Introductory Professional Courses (C- or better) ⁵			12
Choose from one of the following:			3
ACOM 1130G	Effective Leadership and Communication in Agriculture		
COMM 1115G	Introduction to Communication		
COMM 1130G	Public Speaking		3
HNRS 2175G	Introduction to Communication Honors		
General Education Elective Course ¹			3
Second Language Requirement: 1110- level ³			4
Second Language Requirement: 1120- level ³			4
Elective Course ⁴			3
Credits			32
Junior			
JOUR Introductory Professional Course (C- or better) ⁵			6
JOUR - Media Course (C- or better) ⁷			3
JOUR - Upper Division Elective (C- or better)			6
JOUR Advanced Professional Course ⁹			3
VWW - Viewing a Wider World Courses ⁸			6
Elective - Upper Division Course ⁴			6
Credits			30
Senior			
JOUR 493	Media Law (C- or better)		3
JOUR - Upper Division Elective Course (C- or better)			9
Elective - Upper Division Courses ⁴			9
JOUR Advanced Professional Course ⁹			3
Elective Course ⁴			3
Credits			27
Total Credits			121-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Second Language: options for completing the second language requirement can be located on the Requirements (p. 704) tab for this degree.

³ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Introductory Professional Courses: JOUR 300 Introduction to Advertising, JOUR 302 Television Videography & Editing, JOUR 310 Media Writing II, JOUR 319 Intro Photography, JOUR 321 Media Graphic Design, JOUR 374 Introduction to Public Relations, JOUR 407 Media Internship, JOUR 408 Media Practicum

⁵ Intermediate Professional Courses: JOUR 384 Public Relations Storytelling, JOUR 312 Advertising/Copywriting, JOUR 314 Broadcast Reporting, JOUR 315 News 22, JOUR 320 Photojournalism, JOUR 330 TV News Shooting & Editing, JOUR 425 Media Planning and Buying

⁶ Media Course options for the Upper Division JOUR requirement: JOUR 350 Media History, JOUR 377V Mass Media Ethics, JOUR 380 Women and the Media, JOUR 457 Social Media Management and Analytics JOUR 460 Sports & Entertainment P.R., JOUR 470 Environmental, Social, & Governance Public Relations JOUR 489

Media Research, JOUR 494 Special Topics, JOUR 495 Media Theory, JOUR 499 Independent Study in Media

⁷ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁸ Advanced/Capstone Professional Courses: JOUR 412 Documentary Photojournalism, JOUR 414 Broadcast Reporting Portfolio, JOUR 427 Media Writing III JOUR 476 Advertising & Public Relations Campaigns, JOUR 490 IMC Campaign

Strategic Communications (Ad/PR) Focus

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course ¹		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better - will count for Gen Ed requirement)	3
Area V: Humanities, C- or better ¹		3
JOUR 110	Media Writing I	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ¹		4
JOUR 201	Introduction to Multimedia Journalism	3
JOUR 210	Copyediting	3
Elective Course		1
Credits		30-31

Sophomore		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1130G	Public Speaking	
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
Area IV: Social/Behavioral Science Course ¹		3
General Education Elective Course ¹		3
Second Language Requirement: 1110- level ²		4
JOUR 300	Introduction to Advertising	3
Second Language Requirement: 1120-level ²		4
JOUR 374	Introduction to Public Relations (C- or better)	3
Elective Courses ³		7
Credits		30

Junior		
JOUR 312	Advertising/Copywriting (C- or better)	3
JOUR 425	Media Planning and Buying (C- or better)	3
JOUR 384	Public Relations Storytelling (C- or better)	3
MKTG 311V	Consumer Behavior (recommended VWW - Viewing a Wider World)	3
MKTG 303	Principles of Marketing (or POLS course) ⁴	3
JOUR 476	Advertising & Public Relations Campaigns (C- or better)	3
JOUR - Media Course (C- or better) ⁵		3
VWW - Viewing a Wider World Course ⁶		3
MKTG 314	Advertising Strategy (or POLS course) ⁵	3
JOUR 470	Environmental, Social, & Governance Public Relations	3
Credits		30

Senior		
JOUR 493	Media Law (C- or better)	3
JOUR 460	Sports & Entertainment P.R. (C- or better)	3
JOUR Upper Division Elective Course (C- or better)		3
MKTG 357	Internet and Social Media Marketing (or POLS course) ⁵	3
JOUR 457	Social Media Management and Analytics	3
JOUR 490	IMC Campaign	3
JOUR Upper Division Elective Course (C- or better)		3
MKTG 449	Promotion Management (or POLS course)	3
Elective Course - Upper Division ³		3
Elective Course - Upper Division ³		3
Elective Course ³		1
Credits		31
Total Credits		121-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Second Language: options for completing the second language requirement can be located on the Requirements (p. 704) tab for this degree.

³ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Students should take MKTG 303 Principles of Marketing but if PR students want to stay in Government area, it is recommended to double major in Government.

⁵ Media Courses: JOUR 350 Media History, JOUR 377V Mass Media Ethics, JOUR 380 Women and the Media, JOUR 460 Sports & Entertainment P.R., JOUR 489 Media Research, JOUR 494 Special Topics, JOUR 495 Media Theory, JOUR 499 Independent Study in Media

⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Broadcasting Focus

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course ¹		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better, will count for Gen Ed requirement)	3
JOUR 110	Media Writing I	3
JOUR 210	Copyediting	3
JOUR 201	Introduction to Multimedia Journalism	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ¹		4
Area IV: Social/Behavioral Sciences Course ¹		3
Credits		29-30
Sophomore		
JOUR 302	Television Videography & Editing	3
JOUR 319	Intro Photography	3

Choose one from the following:	3
ACOM 1130G Effective Leadership and Communication in Agriculture	
COMM 1115G Introduction to Communication	
COMM 1130G Public Speaking	
HNRS 2175G Introduction to Communication Honors	
Area V: Humanities Course, C- or better ¹	3
General Education Elective Course ¹	3
Second Language Requirement: 1110- level ³	4
Second Language Requirement: 1120-level ³	4
JOUR - Introductory Professional Course (C- or better) ⁵	3
JOUR Intermediate Professional Course (C- or better)	3
Elective Courses ⁴	3
Credits	32
Junior	
JOUR 314 Broadcast Reporting (C- or better)	3
JOUR 330 TV News Shooting & Editing (C- or better)	3
JOUR - Introductory Professional Course ⁵	3
VWW - Viewing a Wider World Courses ⁶	6
JOUR 315 News 22 (C- or better)	3
JOUR - Advanced/Capstone Professional Course (C- or better) ⁷	3
Elective Courses ⁴	3
Elective Courses - Upper Division ⁴	6
Credits	30
Senior	
JOUR 493 Media Law (C- or better)	3
JOUR Upper Division Elective Courses (C- or better)	6
JOUR 414 Broadcast Reporting Portfolio (C- or better)	3
JOUR - Media Course (C- or Better) ⁸	3
Elective Course ⁴	6
Elective Courses - Upper Division ⁴	9
Credits	30
Total Credits	121-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² Second Language: options for completing the second language requirement can be located on the Requirements (p. 704) tab for this degree.

³ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Introductory Professional Courses: JOUR 302 Television Videography & Editing

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁶ Advanced/Capstone Professional Courses: JOUR 412 Documentary Photojournalism, JOUR 414 RTV Scriptwriting/Performance, JOUR 427 Media Writing III JOUR 476 Public Relations Campaigns, JOUR 490 Advertising Campaigns

⁷ Media Course options for the Upper Division JOUR requirement: JOUR 350 Media History, JOUR 377V Mass Media Ethics, JOUR 380 Women and the Media, JOUR 457 Social Media Management and Analytics JOUR 460 Sports & Entertainment P.R., JOUR 470 Environmental, Social, & Governance Public Relations JOUR 489

Media Research, JOUR 494 Special Topics, JOUR 495 Media Theory, JOUR 499 Independent Study in Media

Multimedia and Photojournalism Focus

Freshman	Credits
ENGL 1110G Composition I (C- or better)	4
Area II: Mathematics Course ¹	3-4
MATH 1130G Survey of Mathematics (Recommended (C- or better))	
JOUR 105G Media and Society (C- or better, will count for Gen Ed requirement)	3
Area V: Humanities Course ¹	3
JOUR 110 Media Writing I	3
JOUR 210 Copyediting	3
JOUR 201 Introduction to Multimedia Journalism	3
Choose one from the following:	3
ENGL 2210G Professional & Technical Communication	
ENGL 2221G Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ¹	4
Elective Course(s) ³	2
Credits	31-32
Sophomore	
JOUR 310 Media Writing II	3
Choose one from the following:	3
ACOM 1130G Effective Leadership and Communication in Agriculture	
COMM 1115G Introduction to Communication	
COMM 1130G Public Speaking	
HNRS 2175G Introduction to Communication Honors	
General Education Elective Course ¹	3
Second Language Requirement: 1110- level ²	4
Second Language Requirement: 1120-level ²	4
Area IV: Social/Behavioral Sciences Course ¹	3
JOUR Introductory Professional Course (C- or better)	3
JOUR Introductory Professional Course ⁴	3
JOUR 319 Intro Photography	3
Elective Courses ³	1
Credits	30
Junior	
JOUR Intermediate Professional Course (C- or better)	3
JOUR Upper Division Elective Course	3
JOUR 412 Documentary Photojournalism (C- or better)	3
VWW - Viewing a Wider World Courses ⁵	6
JOUR 306 Sports Writing and Reporting (C- or better)	3
Elective Course - Upper Division ³	6
Elective Courses ³	6
Credits	30
Senior	
JOUR 493 Media Law (C- or better)	3
JOUR Media Course ⁶	3
JOUR Intermediate Professional Course (C- or better) ⁷	3
JOUR 427 Media Writing III	3
JOUR Upper Division Elective Course (C- or better)	3
Elective Courses - Upper Division ³	9

Elective Course ³	6
Credits	30
Total Credits	121-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² Second Language: options for completing the second language requirement can be located on the Requirements (p. 704) tab for this degree.

³ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Introductory Professional Courses: JOUR 300 Introduction to Advertising, JOUR 302 Television Videography & Editing, JOUR 310 Media Writing II, JOUR 374 Introduction to Public Relations

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁶ Media Courses: JOUR 350 Media History, JOUR 377V Mass Media Ethics, JOUR 380 Women and the Media, JOUR 460 Sports & Entertainment P.R., JOUR 489 Media Research, JOUR 494 Special Topics, JOUR 495 Media Theory, JOUR 499 Independent Study in Media

⁷ Recommended JOUR Electives: JOUR 302 Television Videography & Editing, JOUR 306 Sports Writing and Reporting, JOUR 412 Documentary Photojournalism

Journalism and Media Studies - Undergraduate Minor

Students may not earn both a Bachelor of Arts in Journalism and Media Studies and minor in Journalism and Media Studies.

Prefix	Title	Credits
Required Courses		
JOUR 105G	Media and Society	3
JOUR 110	Media Writing I	3
JOUR 210	Copyediting	3
Upper- Division JOUR courses		9
Total Credits		18

Social Media Management - Undergraduate Minor

A student must take the following classes to get a minor in social media management.

Prefix	Title	Credits
Requirements: ¹		
Take all three classes		9
JOUR 110	Media Writing I	
JOUR 374	Introduction to Public Relations	
JOUR 457	Social Media Management and Analytics	
Choose two from the following:		6
JOUR 384	Public Relations Storytelling	
JOUR 460	Sports & Entertainment P.R.	

JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 476	Advertising & Public Relations Campaigns	
Choose one from the following:		3
JOUR 321	Media Graphic Design	
JOUR 319	Intro Photography	
Total Credits		18

¹ Total of 18 credits with the grade of C- or better, are required to get a minor of Social Media Management

Strategic Communications - Undergraduate Minor

A student must take the following classes to get a minor in strategic communications.

Prefix	Title	Credits
Requirements ¹		
JOUR 110	Media Writing I	3
JOUR 300	Introduction to Advertising	3
JOUR 374	Introduction to Public Relations	3
Choose three courses from the following:		9
JOUR 384	Public Relations Storytelling	
JOUR 425	Media Planning and Buying	
JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 476	Advertising & Public Relations Campaigns	
JOUR 490	IMC Campaign	
Total Credits		18

¹ Total of 18 credits with the grade of C- or better are required to get a minor of Strategic Communications.

Languages and Linguistics Undergraduate Program Information

Programs of study in the Department of Languages and Linguistics prepare students for a diverse number of professions and provide them with critical skills that compliment many careers in an increasingly interdependent and global marketplace. Students also increase their awareness of the important role language plays in human interaction on individual and global levels.

Major curriculum plans in each language include balanced groups of courses in language, linguistics, literature and culture. Students may choose to major, double major or minor in French, German or Spanish.

For the undergraduate program in Spanish, students may earn credit by receiving the following scores on the AP exams: More specifically, for the AP Spanish Language and Culture Exam, with a score of 3, students receive 3 credits for either SPAN 316 or 318. With scores of 4 or 5, students receive 6 credits (SPAN 316 or 318) and SPAN 325. For the AP Spanish Literature and Culture Exam, with a score of 3, students receive 3 credits (SPAN 380) and for scores of 4 or 5, they receive 6 credits (SPAN 380 and SPAN 305).

Graduate Program Information

The Department of Languages and Linguistics offers a Master of Arts in Spanish, which may be completed through our program on the main campus or completely online. Students are asked to indicate an area of interest in either linguistics or literature. The degree requires a total of 36 credit hours. It is recommended that students focus at least 27 credit hours of that total in their selected area of interest. Main campus students may select either a thesis or a non-thesis option. Students selecting to follow the thesis option, may count up to 6 credit hours towards their degree total. Online students are limited to the non-thesis option only at this time.

Admission Requirements

Admission requirements include a BA in Spanish. An undergraduate Grade Point Average (GPA) of 3.0 or above, which includes at least 12 semester hours of upper-division undergraduate courses in Spanish with a GPA of at least 3.0. Students must also satisfy general requirements of the Graduate School and submit the proper electronic online application and transcripts at the Graduate School website. Students must also complete a secondary admission packet (also submitted online through the Graduate School electronic application portal), which should include:

- A current resume (C.V.) in Spanish
- Three (3) letters of recommendation from qualified professionals (written within the last six months), preferably from past professors, that address the applicant's academic record.
- A writing sample in Spanish (critical or creative writing texts). If you do not have a six-page paper, you may submit multiple shorter works totaling six pages.
- A Language Evaluation Form (available for download at the departmental website) completed and signed by a qualified language evaluator. If you have an official ACTFL OPI rating certificate, this may be submitted in lieu of the Language Evaluation Form.
- An introductory letter in Spanish to include:
 - A brief biography of one or two paragraphs along with your goals and objectives for obtaining a Master's degree in Spanish
 - A statement of interest in either the residential (on-campus) program or the online program
 - A statement of your prospective area of interest (Linguistics or Literature), and
 - Your declaration of interest in being considered for a Graduate Teaching Assistantship (this option is only available for the residential [on-campus] program).

Only completed applications will be reviewed. Again, all materials should be submitted via the Graduate School electronic application portal. No materials should be sent directly to the department. Applying to the program does not guarantee admission to the program. It is the applicant's responsibility to ensure that all materials have been submitted correctly.

Application deadlines: September 15 for admission for the following Spring semester (which begins in January), and January 15 for admission for the following Fall semester (which begins in August). Students will be advised upon their formal acceptance into the program.

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Chicano Studies - Supplemental Major (p. 746)
- Foreign Languages (French) - Bachelor of Arts (p. 733)
- Foreign Languages (German) - Bachelor of Arts (p. 736)

- Foreign Languages (Spanish) - Bachelor of Arts (p. 738)
- Latin American Studies - Supplemental Major (p. 745)
- Linguistics - Bachelor of Arts (p. 741)
- Linguistics - Supplemental Major (p. 747)

Master Degree(s)

- Spanish - Master of Arts (p. 166)
- Spanish - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/spanish-ma-online/>)

Minors for the Department

- East Asian Studies - Undergraduate Minor (p. 744)
- French - Undergraduate Minor (p. 744)
- German - Undergraduate Minor (p. 744)
- International Studies - Undergraduate Minor (p. 744)
- Linguistics - Undergraduate Minor (p. 745)
- Spanish - Undergraduate Minor (p. 745)

Professor, Glenn W. Fetzer, Department Head

Professors Herrera, MacGregor-Mendoza, Waltermire **Associate Professors** Moreno **Assistant Professors** Bove, Figueroa Obregon, Iglesias Pascual **College Professor** Longwell; **College Associate Professors** Pedersen, Zollner

K. Bove, Ph.D. (Georgia); G. Fetzer, Ph.D. (CUNY); R. Figueroa Obregon, Ph.D. (Oklahoma); S. Herrera, Ph.D. (New Mexico); I. Iglesias Pascual, Ph.D. (Ohio); J. Longwell, Graduate Director, Ph.D. (New Mexico State University); P. MacGregor-Mendoza, Ph.D. (Illinois- Urbana-Champaign); G. Moreno, Ph.D. (Arizona); M. Waltermire, Ph.D. (New Mexico);

Chinese Courses

CHIN 1110. Mandarin Chinese I

4 Credits (4)

This is the first semester of a two-semester sequence in first year modern standard Chinese ("Mandarin"). This course is recommended for students who have had little or no experience in the Chinese language. A beginning Mandarin Chinese course is designed to introduce the Mandarin sound system ("pinyin"), basic vocabulary, Chinese characters (either in Simplified or Traditional characters), and basic grammatical concepts and structures. In order to help beginners develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course.

Learning Outcomes

1. Approach a novice-mid proficiency (ACTFL) in speaking, listening, reading, writing, as well as to develop their cultural awareness
2. Demonstrate knowledge of the phonetic system in Mandarin Chinese
3. Pronounce Chinese pinyin in correct tones
4. Demonstrate the mastery of the most commonly used characters (approximately 400-500)
5. Understand basic Chinese grammatical concepts
6. Use basic Mandarin vocabulary, introductory phrases and sentences in both oral and written forms
7. Understand greetings in China, countries and nationalities, Chinese family values, hobbies, and being someone's guest in China
8. Apply the language to greet each other, identify countries and nationalities, talk about his/her family, discuss important dates, talk about hobbies, and visit a friend in China
9. Develop basic reading and writing skills in Chinese 1
10. Develop initial understanding of Chinese culture, compare aspects of different cultures, make connections to their daily life, and build links among communities

CHIN 1120. Mandarin Chinese II

4 Credits (4)

This is the second semester of a two-semester sequence in first year modern standard Chinese ("Mandarin"). This course is designed for students who have taken 1st Semester Mandarin Chinese, and focuses on enhancing pronunciation and expanding the vocabulary and grammar dealing with daily activities. In order to help beginners develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course.

Prerequisite(s): C or better in CHIN 1110.

Learning Outcomes

1. Maintain a novice-mid and approach a novice-high proficiency (ACTFL) in speaking, listening, reading and writing, as well as to enhance their cultural awareness
2. Demonstrate continued mastery of the four tones used in Mandarin Chinese
3. Demonstrate continued mastery of the most commonly used characters (approximately 500-600)
4. Apply basic grammatical concepts and structures, and begin exploring intermediate grammatical concepts
5. Demonstrate continued growth in vocabulary and expressions necessary for conversation in and about real life situations
6. Understand basic phone calls, discussion of studies, school life, shopping and transportation
7. Apply the language to make simple phone calls, discuss studies, talk about school life, go shopping and use transportation
8. Continue developing basic reading and writing skills in Chinese
9. Develop further understanding of Chinese culture, compare aspects of different cultures, make connections to their daily life, and build links among communities

CHIN 2110. Mandarin Chinese III**3 Credits (3)**

This is the first semester of a two-semester sequence in second year modern standard Chinese ("Mandarin"). This course is designed for students who have taken 1st and 2nd Semester Mandarin Chinese (or equivalence), and have a basic foundation on Chinese phonetics, characters, and grammars. In order to help students develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course. Restricted to Las Cruces campus only.

Prerequisite(s): C or better in CHIN 1120.

Learning Outcomes

1. Maintain a novice-high and approach an intermediate-low proficiency (ACTFL) in speaking, listening, reading and writing, as well as to enhance their cultural understanding
2. Pronounce the four tones used in Mandarin Chinese comfortably
3. Demonstrate continued mastery of the most commonly used characters (approximately 600-800)
4. Apply intermediate grammatical concepts and structures
5. Demonstrate continued growth in vocabulary and expressions in a variety for conversation in and about real life situations
6. Understand topics including but not limited to simple weather reports, dinning, directions, birthday party stories, and seeing a doctor
7. Apply the language to talk about weather, order food, ask and give directions, describe birthday parties, and see a doctor (these are suggested topics, no intention to limit the topic range)
8. Continue developing paragraph-length reading and writing skills in Chinese
9. Deepen understanding of Chinese culture, compare aspects of different cultures, make further connections to their daily life, and build stronger links among communities

CHIN 2120. Mandarin Chinese IV**3 Credits (3)**

This is the second semester of a two-semester sequence in second year modern standard Chinese ("Mandarin"). This course is designed for students who have taken 1st, 2nd, and 3rd Semester Mandarin Chinese (or equivalence), and have a good foundation on Chinese phonetics, characters, and grammars. In order to help students develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course. Restricted to Las Cruces campus only.

Prerequisite(s): C or better in CHIN 2110.

Learning Outcomes

1. Maintain an intermediate-low and approach an intermediate-mid proficiency (ACTFL) in speaking, listening, reading and writing, as well as to strengthen their cultural understanding
2. Pronounce the four tones used in Mandarin Chinese fluently
3. Demonstrate continued mastery of the most commonly used characters (approximately 800-1000)
4. Apply more intermediate grammatical concepts and structures
5. Demonstrate continued growth in vocabulary and expressions in a variety for conversation in and about real life situations as well as simple academic settings
6. Demonstrate language skills that would help them travel or live in China
7. Understand topics including but not limited to dating, renting an apartment, sports, traveling, conversations at an airport
8. Apply the language to extend/decline invitations, rent an apartment, talk about sports, travel, check in and arrive at an airport (these are suggested topics, no intention to limit the topic range)
9. Continue developing multiple-paragraph-length reading and writing skills in Chinese I
10. Deepen understanding of Chinese culture, compare aspects of different cultures, make further connections to their daily life, and build stronger links among communities

CHIN 311. Advanced Chinese Language I**3 Credits (3)**

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

Prerequisite(s): Grade of C or better in CHIN 2110 and CHIN 2120.

CHIN 312. Advanced Chinese Language II**3 Credits (3)**

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

Prerequisite(s): Grade of C or better in CHIN 311.

French courses

FREN 1110. French I

4 Credits (4)

Intended for students with no previous exposure to French, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-high level. This is an introductory course designed to teach the student to communicate in French in everyday situations and to develop an understanding of French and Francophone cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.

Learning Outcomes

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can identify beliefs, behaviors and cultural artifacts of the French-speaking world.
9. In English, students will engage with social issues confronting the French-speaking world to develop their sense of personal and social responsibility.

FREN 1120. French II

4 Credits (4)

A continuation of French I, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-low level. This course is designed to increase student fluency in French as applied to everyday situations. Students will also learn to recognize and understand various French and Francophone products, practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues. May be repeated up to 4 credits.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts of the French-speaking world.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2110. French III**3 Credits (3)**

In this third semester course, students will continue to develop a broader foundation in skills gained during the first year, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-mid level. This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various French and Francophone products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and discuss the nature and value of French and Francophone products, practices, and perspectives.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2120G. French IV**3 Credits (3)**

In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing French aiming at the ACTFL intermediate-high level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various French and Francophone products, practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction. May be repeated up to 3 credits.

Learning Outcomes

1. Students can participate with ease and confidence in conversations on familiar topics. They can usually describe people, places, and things. They can usually talk about events and experiences in various time frames.
2. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
3. Students can write about topics related to school, work, and community in a generally organized way. They can write some simple paragraphs about events and experiences in various time frames.
4. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can usually understand a few details of what I overhear in conversations, even when something unexpected is expressed. The student can sometimes follow what they hear about events and experiences in various time frames.
6. Students can understand the main idea of texts with topics related to everyday life, personal interests, and studies, as well as sometimes follow stories and descriptions about events and experiences in various time frames.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and recognize and discuss the representations and controversies of French and Francophone products, practices, and perspectives.
8. Students demonstrate the essential skills of Critical Thinking, Personal and Social Responsibility, and Information and Digital Literacy, as per the New Mexico General Education Curriculum

FREN 306. Topics in French Culture and Civilization**1-3 Credits (1-3)**

Selected topics focusing on French culture and civilization. This course is linked to FLIP (Faculty-Led International Programs) when applicable. May be repeated up to 4 credits.

Learning Outcomes

1. Recognize the arrondissements of Paris and describe their identifying characteristics.
2. Navigate through Paris effectively and knowingly.
3. Communicate effectively with native speakers of the language.
4. Exemplify qualities of a good guest in a francophone culture.
5. Talk knowledgeably about a topic related to Paris and Parisians.

FREN 315. French Grammar**3 Credits (3)**

A thorough review of French grammar through the study of grammatical elements and the use of grammatical exercises. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of the course, students should be familiar with a review of grammar for all tenses, pronouns, adverbs, adjectives.
2. Students should attain the intermediate high level in all areas (Listening, Speaking, Reading, Writing, Attitudinal / Cultural) on the American Council on the Teaching of Foreign Languages (ACTFL) scale.
3. By the end of the course, students should be familiar with spoken speech at paragraph level.
4. By the end of the course, students should be familiar with writing a narrative in the past and future tenses.

FREN 325. Intermediate Conversation**3 Credits (3)**

French conversation through intensive oral practice with emphasis on vocabulary acquisition and pronunciation. May be repeated up to 3 credits.

Learning Outcomes

1. To enhance active vocabulary acquisition.
2. To provide opportunities for the learner's speech to progress from short utterances to more connected, sustained speech.
3. To address pronunciation issues.
4. To enhance presentation skills.
5. To improve auditory proficiency.
6. Based on the scale established by the American Council on the Teaching of Foreign Languages (ACTFL), the performance goals for the course are: (A) Listening Intermediate High, (B) Speaking Intermediate High, (C) Reading Advanced Low, (D) Writing Intermediate High.

FREN 330. Business French**3 Credits (3)**

An introduction to standard language within the corporate world in French-speaking countries. Students practice reading, writing, listening, speaking and expanding their vocabulary in professional fields related to business.

Learning Outcomes

1. Use business and legal vocabulary.
2. Demonstrate basic competency in French corporate etiquette.
3. Interact in a culturally appropriate manner in common business situations, including meetings, sales calls, business letters, and e-mails.
4. Demonstrate familiarity in using French in business-related situations.

FREN 352. French Phonetics**3 Credits (3)**

Systematic description of modern French pronunciation. Corrective exercises for foreign learners. Formal study of spelling/pronunciation relationships. May be repeated up to 3 credits. Corequisite(s): FREN 2120

FREN 360. French Cinema**3 Credits (3)**

The evolution of contemporary French cinema. A critical understanding of film as an art form and as cultural expression.

Prerequisite: FREN 2120 or consent of instructor.

FREN 362. Contemporary French Culture**3 Credits (3)**

Institutions, lifestyles and popular attitudes in modern France.

Prerequisite: FREN 2120 or consent of instructor.

FREN 365V. Perspectives in French Culture**3 Credits (3)**

Examines components of French culture through literature, films and other sources. Taught in English. Does not satisfy Arts and Sciences second language requirement. Does not satisfy French major or minor requirements.

FREN 378. Studies in Francophone Cultures**3 Credits (3)**

Studies of representative Francophone cultures through their history, literature, music and films.

Prerequisite: FREN 2120 or consent of instructor.

FREN 381. Survey of French Literature I**3 Credits (3)**

Literary movements, authors and selected texts of the Middle Ages through the eighteenth century.

Prerequisite: FREN 2120 or consent of instructor.

FREN 382. Survey of French Literature II**3 Credits (3)**

Literary movements, authors and selected texts of the nineteenth and twentieth centuries.

Prerequisite: FREN 2120 or consent of instructor.

FREN 385. French Civilization**3 Credits (3)**

A detailed study of important events in French civilization from its origins to the twentieth century through the study and discussion of history, literature, fine arts and politics.

Prerequisite: FREN 2120 or consent of instructor.

FREN 386. Contemporary Women Writers in French**3 Credits (3)**

Exploration of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

Prerequisite: FREN 2120 or consent of instructor.

FREN 410. Paris: History and Cultures**3 Credits (3)**

An in-depth look at history and culture of Paris from its origins to the present.

Prerequisite(s): FREN 212 or consent of instructor.

FREN 425. Advanced French Conversation**3 Credits (3)**

Mastery of spoken French language through discussion of personal readings and group work to develop vocabulary, syntactical and conversational skills. The class is conducted entirely in French.

Prerequisite(s): FREN 325 or consent of instructor.

FREN 449. French for Specific Purposes**3 Credits (3)**

Directed reading for students to satisfy language requirement for master's or doctoral programs. May be repeated up to 6 credits.

FREN 451. Special Topics in French**1-3 Credits**

Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

FREN 453. Independent Studies in French**1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

FREN 478. Studies in Francophone Cultures Around the World**3 Credits (3)**

Advanced studies of representative Francophone cultures through their history, literature, music and films.

Prerequisite: FREN 2120 or consent of instructor.

FREN 486. Advanced Contemporary Women Writers in French**3 Credits (3)**

Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

Prerequisite: FREN 2120 or consent of instructor.

German Courses**GRMN 1110. German I****4 Credits (4)**

Intended for students with no previous exposure to German, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-mid level. This is an introductory course designed to teach the student to communicate in German in everyday situations and to develop an understanding of German cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.

Learning Outcomes

1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can write lists and memorized phrases on familiar topics.
3. Students can recognize some familiar words and phrases when they hear them spoken.
4. Students can recognize some letters or characters.
5. Students can understand some learned or memorized words and phrases when they read.
6. Students can identify beliefs, behaviors and cultural artifacts of the German-speaking world.
7. In English, students will engage with social issues confronting the German-speaking world to develop their sense of personal and social responsibility

GRMN 1120. German II**4 Credits (4)**

A continuation of German 1, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing German aiming toward the ACTFL novice-high level. This course is designed to increase student fluency in German as applied to everyday situations. Students will also learn to recognize and understand various German products, practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues.

Prerequisite(s): C or better in GRMN 1110.

Learning Outcomes

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts of the German-speaking world.
9. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2110. German III**3 Credits (3)**

In this third semester course, students will continue to develop a broader foundation in skills gained during the first two semesters, including understanding, speaking, reading and writing German aiming toward the ACTFL intermediate-low level. This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various German products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives.

Prerequisite(s): C or better in GRMN 1120.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and discuss the nature and value of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2120. German IV**3 Credits (3)**

In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing German aiming at the ACTFL intermediate-mid level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various German products, practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction.

Prerequisite(s): C or better in GRMN 2110.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and recognize and discuss the representations and controversies of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to create ways to demonstrate their sense of personal and social responsibility.

GRMN 305. Topics in German Culture**3 Credits (3)**

Group study of selected topics focusing on German culture and civilization. This course is linked to FLiP courses (Faculty-Led international Programs) when applicable. Topics identified by subtitle in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics.

Learning Outcomes

1. (Language) Students will show more confidence in their German speaking, listening and writing abilities.
2. (Culture): Students will demonstrate knowledge of the culture of German institutions, of Berlin (through reflection and discussion sessions) after visits to historical, architectural and cultural sites as well as direct interaction with the locals.
3. (Culture): Students will demonstrate competence at navigating a culture different from their own.
4. (Culture): Students will demonstrate (through reflection and discussion sessions) a greater appreciation for the diversity of German identity.

GRMN 313. Intermediate Composition and Grammar**3 Credits (3)**

A review of the rules of German grammar. Development of written German skills. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Students will show their improvement in writing skills in German through the application of accurate grammar rules practiced in the course.
2. Students will show their improvement in vocabulary usage in German by using more varied and appropriate vocabulary in their writing.
3. Students will show their improvement in writing organization.

GRMN 325. German Conversation I**3 Credits (3)**

Intensive oral communication practice. Not open to heritage/native speakers of German. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to demonstrate a quantifiable increase in your conversational skills by comparing your their final score (post-test) to their score in the oral pre-test, taken on the first/second day of classes.
2. This means being able to communicate their thoughts, opinions, emotions, etc. as they intend them to be understood by others. AND to be able to understand what others are saying to them so they can respond accordingly better than they did at the beginning of the course, according to the ACTFL Oral Proficiency (OPI) standards.

GRMN 330. Business German**3 Credits (3)**

An introduction to standard language within the corporate world in German-speaking countries. During the semester, students will practice reading, writing, listening, speaking and expanding their vocabulary in the fields related to business, technology (ex. Engineering) and health (ex. Nursing, Psychology, etc.).

GRMN 340. Introduction to Translation**3 Credits (3)**

General aspects of Translation from German to English and English to German. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate understanding of the concept of translation by reading translation theory.
2. Demonstrate an enhanced knowledge of German as related to translation practices.
3. Demonstrate the ability to use specialized vocabulary and concepts in various professional areas.
4. Demonstrate knowledge of the translator's place as a professional.
5. Develop and enhance their linguistic competence and cultural awareness.

GRMN 341. German Folklore and Culture**3 Credits (3)**

Customs, traditions, mythology, folk literature and art. Special focus on Grimms' fairy tales. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate improvement in reading skills in German by one ACTFL level by augmenting vocabulary, grammatical accuracy, and reading comprehension skills.
2. Describe the 5 basic motifs in folktales (FT) and where they supposedly come from.
3. List and define the 9 types of FT (Teverson) according to their functions.
4. Discuss the impact of the enlightenment in the structure of FT, Evaluate the influence of the industrial revolution and the development of a bourgeois society in FT.
5. Critique the position of the present-day, pop-cult media in its recently created versions of FT.

GRMN 350. Introduction to German Literature**3 Credits (3)**

Basic literary genres and major figures in German language literature from its beginnings to the 19th century. GRMN 2120 or equivalent is recommended. To be followed by GRMN 471 - Studies in German Literature. May be repeated up to 3 credits. Consent of Instructor required.

Learning Outcomes

1. Demonstrate an improvement on reading skills in German by one ACTFL level by augmenting active vocabulary, grammatical accuracy and reading comprehension skills.
2. Describe the authors, styles and basic discourses of 3 periods of German-language literature (old and middle high German from early the medieval literature, the protestant reformation; High German and literature academies: the fifteenth to seventeenth Centuries; and the Eighteenth Century.

GRMN 399. Intermediate Independent Study in German**1-3 Credits (1-3)**

Tutorial in reading, writing and oral expression for intermediate-level students of German. Topics identified in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics. May be repeated up to 6 credits. Consent of Instructor required.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 410. Practicum in Conversational German**1-3 Credits**

Intensive oral communication practice for students with a strong German language foundation. May be repeated up to 6 credits.

Prerequisite(s): GRMN 325 or consent of instructor.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 413. Advanced Composition and Grammar**3 Credits (3)**

Exercises in written German with emphasis on stylistic features.

Prerequisite: GRMN 313 or consent of instructor.

GRMN 425. Advanced German Conversation**3 Credits (3)**

Advanced conversation through intensive oral practice.

Prerequisite(s): GRMN 325 or consent of instructor.

GRMN 451. Special Topics in German**1-3 Credits**

Selected topics to be identified by subtitle in the Schedule of Classes.

May be repeated for up to 6 credits with different topic. May be repeated up to 12 credits.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 453. Independent Studies in German**1-3 Credits (1-3)**

Individualized, self-paced research projects for advanced-level students of German. Topics identified by subtitle in the Schedule of Classes.

GRMN 2120 or equivalent is recommended. May be repeated up to 12 credits.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 455. German for Specific Purposes**1-3 Credits (1-3)**

Directed reading for students to satisfy language requirements for master's and doctoral programs. Topics identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

Language Courses**LANG 111. Beginning Language I****4 Credits (4)**

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.

Prerequisite: Language placement exam or consent of the instructor.

LANG 451. Special Topics**1-3 Credits**

Selected topics relating to cultures or literatures of a specific country. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. May be repeated for a maximum of 12 credits. Consent of instructor required.

LANG 453. Independent Studies**1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated under different subtitles for a maximum of 6 credits.

Prerequisite: consent of instructor.

LANG 490. Introduction to Yucatec Maya Language and Culture I**3 Credits (3)**

This course provides the student with an introduction to Yucatec Maya language and culture of Yucatan.

Learning Outcomes

1. students will be able to identify who and where Yucatec Maya is spoken, describe the sound system and basic syntax of the language, participate in basic introductory conversations and make connections between the language and culture of Yucatan.

Linguistics Courses**LING 2110G. Introduction to the Study of Language and Linguistics****3 Credits (3)**

This course presents an introduction to the study of language through the basic aspects of linguistic analysis: the sound system (phonetics and phonology), the structure of words and sentences (morphology and syntax), and the ways in which language is used to convey meaning (semantics and pragmatics). In addition, the course will investigate how language is acquired and stored in the brain, and how differences in speech styles and dialects reflect different social and cultural backgrounds of individual speakers.

Learning Outcomes

1. Understand the basic concepts and terminology associated with phonetics, phonology, morphology, syntax, semantics, and pragmatics.
2. Comprehend how language evolves over history and over an individual's lifespan.
3. Describe some common, but mistaken, beliefs about language and to distinguish between descriptive and prescriptive approaches to language.
4. Describe the social, psychological, geographic and historical influences that lead to language dominance or language endangerment.
5. Be aware of the relations among various languages in the world, between dialects and slang, and between human and non-human languages.
6. Apply methods of linguistic analysis as introduced in the course.
7. Critically engage with the works of linguistic researchers.
8. Stimulate curiosity about language and what it reveals about the human mind.

LING 301. Introduction to Psycholinguistics**3 Credits (3)**

Psychological aspects of language, including linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as PSYC 301.

LING 302V. Language and Society**3 Credits (3)**

Study of how social identity including such factors as ethnicity, age, sex, education, power and socio-economic class is expressed in language systems and how misunderstandings arise between groups. Research skills are emphasized.

LING 303. Exploring Language Systems**3 Credits (3)**

Forms of linguistic semantic, syntactic and phonological organization.

Prerequisite(s): LING 2110G.

LING 405. Topics in Linguistics**3 Credits (3)**

Selected linguistics topics subtitled in the Schedule of Classes. May be repeated for a maximum of 6 credits under different subtitles.

Prerequisite: consent of instructor.

LING 425. Language and the Mind: Introduction to Psycholinguistics
3 Credits (3)

This course is an introduction to psycholinguistics; the study of how humans learn, represent, comprehend and produce language. Throughout this course, we address a variety of questions on the psychology of language most of which are still being answered. These include: What does it mean to know a language? What are the cognitive processes involved in language use? How do we produce and recognize speech? How can we improve texts and make them easier to read? How can we control speech in special situations to avoid errors?

Prerequisite(s): LING 2110G or consent of instructor.

LING 451. Independent Studies in Linguistics
1-3 Credits

Individual or group study of selected topics to be identified by subtitle. May be repeated for a maximum of 6 credits.

Prerequisites: LING 2110G and prior arrangement with faculty supervisor.

LING 455. Research in Linguistics
3 Credits (3)

This course will provide a capstone experience for students who have progressed through the program in linguistics and provide the foundation for further study at the post-graduate level in a linguistics-related field. Students will apply their foundation of knowledge and skills in linguistics through the realization of an individualized, inquiry-based project.

Consent of instructor may enroll student only in case of elective credit shortfall with concurrent enrollment.

Prerequisite(s): LING 2110G, LING 301, LING 302V, LING 303, plus 9 credit hours of related electives.

LING 500. Introduction to Linguistics
3 Credits (3)

Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics and some of the theoretical issues in the field.

LING 502. Graduate Study in Sociolinguistics
3 Credits (3)

Study of how social identity including factors such as ethnicity, age, gender education and socio-economic class is expressed in language systems.

Prerequisites: LING 2110G or LING 500 recommended.

LING 503. Exploring Language Systems- Grad
3 Credits (3)

Students will be responsible for all requirements of LING 303 and will undertake independent, directed research.

Prerequisite(s): LING 2110G or LING 500.

LING 505. Selected Topics
3 Credits (3)

Studies, varying from year to year, in linguistics.

Portuguese Courses**PORT 1110. Portuguese I**
3 Credits (3)

Designed for students with no previous exposure to Portuguese, this course develops basic listening, speaking, reading, and writing skills. This is an introductory course aimed at teaching the student to communicate in Portuguese in everyday situations.

Learning Outcomes

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can handle most short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can make connections between beliefs, behaviors and cultural artifacts of the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 1120. Portuguese II
3 Credits (3)

A continuation of Portuguese I, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing Portuguese. Students will also gain more in-depth knowledge of Portuguese-speaking cultures.

Prerequisite: C or better in PORT 1110 or consent of instructor.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write about familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can begin to narrate and describe simple events in the past.
8. Students can make broader connections between beliefs, behaviors and cultural artifacts of the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 453. Independent Luso-Brazilian Studies
1-3 Credits (1-3)

Individualized, self-paced projects for advanced students in Luso-Brazilian studies. May be repeated up to 12 credits. Consent of Instructor required.

**PORT 513. Graduate Portuguese for Romance Language Students I
3 Credits (3)**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

**PORT 514. Graduate Portuguese for Romance Language Students II
3 Credits (3)**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

Prerequisite(s): Language placement exam or C or better in PORT 513, or consent of instructor.

Spanish Courses

**SPAN 1110. Spanish I
4 Credits (4)**

Designed for students with little exposure to Spanish, this course develops basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication at the Novice Level of proficiency based on ACTFL guidelines. During this course, students perform better and stronger in the Novice Mid level while some abilities emerge in the Novice High range. This is an introductory course aimed at helping the student to communicate in Spanish in everyday familiar situations via recognition and production of practiced or memorized words, phrases, and simple sentences.

Prerequisite(s): language placement and/or assessment by departmental examination.

Learning Outcomes

1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can present information about myself and some other very familiar topics using a variety of words, phrases, and memorized expressions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and some-times understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.

**SPAN 1120. Spanish II
4 Credits (4)**

Designed for students with some degree of exposure to Spanish in high school and/or at home, this course continues to develop basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication based at the Novice High Level of proficiency based on ACTFL guidelines, although a few abilities may emerge in the Intermediate Low Level.

Students in this course communicate in Spanish in familiar topics using a variety of words, phrases, simple sentences and questions that have been highly practiced and memorized.

Prerequisite: language placement and/or assessment by departmental examination or a C- or better in SPAN 1110.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can present basic information on familiar topics using language they have practiced using phrases and simple sentences.
4. Students can write briefly about most familiar topics and present information using a series of simple sentences.
5. Students can understand the main idea in short, simple messages and presentations on familiar topics.
6. Students can understand the main idea of simple conversations that they overhear.
7. Students can understand the main idea of short and simple texts when the topic is familiar.

SPAN 1210. Elementary Spanish for Heritage Learners I
3 Credits (3)

This is a beginning-level Spanish course designed for students who have a cultural connection to the Spanish language. Some students have had very little exposure to the language and enter the class to develop beginning-level skills. Other students may have grown up hearing the heritage language in the community and may understand some Spanish and speak at a basic level as a result. The objective is to draw upon the connection to the heritage language as a source of motivation and engagement for our learning communities. At the same time, we build upon the language base that students may already have as a result of their heritage learner experience in order to develop new proficiencies in Spanish and reactivate the Spanish that students have learned previously. By the end of this course, students will be able to describe their home, campus surroundings and common activities including cultural traditions. At the same time, students gain cultural competency and develop a critical understanding of their linguistic and cultural background. Students who have previously earned a C or better in SPAN 1110 or SPAN 1120 may not receive credit for this course.

Learning Outcomes

1. Interpersonal Communication: Students can engage in exchanges in culturally appropriate ways using understandable pronunciation on familiar topics using contextualized words, phrases, common idiomatic expressions, and simple sentences.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language that describes a past/present/future (fictional) event to the reader.
3. Interpretive listening: Students can understand familiar questions and statements from simple sentences in conversations.
4. Interpretive reading: Students can identify the topic and some isolated facts from simple sentences in informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with subsequent courses.

SPAN 1220. Spanish for Heritage Learners II
3 Credits (3)

Spanish as a Heritage Language II is a second semester class designed for students who have developed some basic Spanish proficiency from previous classes and/or from community experiences. This course provides students with the opportunity to develop their proficiency in the four language skills (speaking, listening, reading, and writing). Class activities are designed to strengthen oral communication skills (speaking and listening) through a variety of group activities. By the end of the course students will be able to understand and produce narrations of past events in oral and written Spanish. In order to foster a desire to revitalize and maintain the Spanish language in the US context we attempt to raise students' critical awareness of what it means to be part of a specific speech community.

Learning Outcomes

1. Interpersonal Communication: Students can engage in basic but authentic conversations through providing and obtaining information, expressing likes and dislikes, describing their daily lives, and narrating simple events in the past.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that describes a past (fictional) event to the reader.
3. Interpretive listening: can identify the main idea in short conversations.
4. Interpretive reading: Students can identify the topic and related information from simple sentences in short informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 2110. Spanish III**3 Credits (3)**

This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.

Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 1120.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can handle short social interactions in everyday situations by asking and answering a variety of questions.
3. Students can usually say what they want to say about themselves and their everyday life.
4. Students can make presentations on a wide variety of familiar topics using connected sentences
5. Students can write on a wide variety of familiar topics using connected sentences.
6. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
7. Students can understand the main idea in conversations that they overhear.
8. Students can understand the main idea of texts related to everyday life and personal interests or studies.

SPAN 2120. Spanish IV**3 Credits (3)**

This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.

Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 2110.

Learning Outcomes

1. Students can participate with ease and confidence in conversations on familiar topics.
2. Students can usually talk about events and experiences in various time frames.
3. Students can usually describe people, places, and things.
4. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
5. Students can make presentations in a generally organized way on school, work, and community topics, and on topics they have researched.
6. Students can make presentations on some events and experiences in various time frames.
7. Students can write on topics related to school, work, and community in a generally organized way.
8. Students can write some simple paragraphs about events and experiences in various time frames.
9. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies. 1
10. Students can usually understand a few details of what they overhear in conversations, even when something unexpected is expressed. 1
11. Students can sometimes follow what they hear about events and experiences in various time frames. 1
12. Students can easily understand the main idea of texts related to everyday life, personal interests, and studies. 1
13. Students can sometimes follow stories and descriptions about events and experiences in various time frames.

SPAN 2210. Spanish for Heritage Learners III
3 Credits (3)

Intermediate Spanish for Heritage Speakers I is a third semester course designed for students who have been raised in a Spanish-speaking environment and speak, or understand, some Spanish as a result of hearing it in the home, and in the community by family, friends, and neighbors. Students in this course will continue to develop their ability to narrate events in the past and will be able to describe hypothetical situations. Students will also develop their ability to express wishes, desires, and necessities. This course will help the student build confidence in their Spanish abilities and expand the language use in the areas of writing, reading, oral production and listening comprehension. In order to foster a desire to revitalize and maintain the Spanish language we attempt to raise students' critical awareness of wider issues facing Spanish speakers in the US context. May be repeated up to 3 credits.

Learning Outcomes

1. Interpersonal Communication: Students can exchange information on a wide variety of familiar topics in which the students use appropriate vocabulary to describe their daily lives and narrate events in the past with some degree of ease and confidence.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that effectively conveys a series of past (fictional) events to the reader that may include recent and distant past.
3. Interpretive listening: Students can identify the main idea and key information in short straightforward conversations.
4. Interpretive reading: Students can understand the main idea and key information in short straightforward informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 305. Topics in Hispanic Civilization
3 Credits (3)

Group study of selected topics focusing on Hispanic culture and civilization. Topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 306. Special Topics
3 Credits (3)

Group study of Spanish for specialized purposes (e.g. court interpreting, professional language for bilingual teachers, technical writing for the business community). Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 316. Grammar for Non-Native Speakers of Spanish
3 Credits (3)

For students who did not grow up speaking Spanish. A review of the rules of Spanish grammar. Students cannot receive credit for both SPAN 316 and SPAN 318.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in Spanish by becoming more adept at using a variety of grammatical structures.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 317. Composition for Non-Native Speakers of Spanish
3 Credits (3)

For students who did not grow up speaking Spanish. Development of professional and academic writing skills in Spanish. Students cannot receive credit for both SPAN 317 and SPAN 319.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanish by employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 318. Grammar for Heritage/Native Speakers of Spanish
3 Credits (3)

For students who speak or have been exposed to Spanish at home or in the community. A review of grammatical concepts and analysis of both spoken and written Spanish. Students cannot receive credit for both SPAN 316 and SPAN 318.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written and spoken Spanish by using a variety of grammatical structures.
3. Students will sharpen their Spanish communication skills, which will assist them in securing employment as bilingual speakers.
4. Students will develop a stronger appreciation for the Spanish communication skills and cultural awareness which will assist them in contributing to their communities in meaningful ways.
5. Students will gain critical thinking skills as they sharpen their bilingual abilities.

SPAN 319. Composition for Heritage/Native Speakers of Spanish
3 Credits (3)

For students who speak or have been exposed to Spanish at home or in the community. Development of writing strategies, styles and techniques in the Spanish language. Students cannot receive credit for both SPAN 317 and SPAN 319.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanish by employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 325. Advanced Conversation

3 Credits (3)

Intensive oral practice. Not open to heritage/native speakers of Spanish.

Prerequisite(s): SPAN 2120 or consent of instructor.

SPAN 327. Spanish in the Community

3 Credits (3)

Emphasis on use of Spanish outside the classroom in the local communities. Activities include but are not limited to oral histories, language mentoring in schools, assisting with cultural activities and language research.

Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to apply bilingual and bicultural skills to serve the community.

SPAN 330. Variations in Spanish

3 Credits (3)

The study of social variation within the Spanish language, examining both social and linguistic factors that affect language change.

Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to linguistic variations.
5. Students will learn about variations in the Spanish language and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 340. Introduction to Spanish Linguistics

3 Credits (3)

General aspects of Spanish linguistics: traditional, descriptive, historical and dialectal.

Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to Spanish linguistics.
5. Students will learn about a wide range of linguistics topics and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 350. Introduction to Chicano Studies

3 Credits (3)

Covers Mexican-American life including language, history, education, politics and literature.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano Studies.
5. Students will learn about various Chicano cultural and historical themes and how they affect the Chicano community today.

SPAN 361. US-Mexico Border Culture & Literature**3 Credits (3)**

Study of major authors and/or cultural trends in the U.S.-Mexico border. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of border literature and culture.
5. Students will learn about the value of US-Mexico border culture and literature and how they help form unique border communities.

SPAN 364V. Culture and Civilization of Mexico**3 Credits (3)**

Familiarization with culture, civilization and regions of Mexico. History, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Mexican culture and civilization on the Southwest United States. Taught in English. Does not satisfy Arts and Sciences second language requirement.

SPAN 365V. Culture and Civilization of Spanish America**3 Credits (3)**

Familiarization with culture, civilization and regions of Spanish America. Study of history, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Spanish American culture and civilization on the Southwest United States. Taught in English. Does not satisfy College of Arts and Sciences second language requirement.

SPAN 380. Introduction to Hispanic Literature**3 Credits (3)**

Works in Spanish, all genres and periods. How to read literature in all forms.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature.
5. Students will read foundational Hispanic texts of various genres and periods and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 385. Introduction to Chicano/US-Mexican Literature**3 Credits (3)**

Introduction to the study of major works by Chicano/US-Mexican authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres and learn how they create and sustain a national Chicano consciousness.

SPAN 388. Contemporary Hispanic Literature**3 Credits (3)**

Study of Peninsular and Spanish-American literature from the 20th century to the present.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature.
5. Students will read foundational Hispanic texts of various genres from the 20th and 21st centuries and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 393. Introduction to Translation and Interpretation**3 Credits (3)**

General aspects of translation and interpretation from English to Spanish and Spanish to English. Selected subject to be identified by subtitle in the Schedule of Classes.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms, concepts, and strategies related to translation and interpretation.
5. Students will learn how to translate written texts and/or interpret live communication between the Spanish and English languages. However, other languages may be included at instructor's discretion.

SPAN 399. Independent Studies in Literature, Language, or Culture**1-3 Credits**

Individualized, self-paced projects for advanced students. Students must present formal proposal of study.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to connect the value between literature, language, and culture and how to apply this knowledge to serve their community.

SPAN 411. Creative Writing**3 Credits (3)**

Creative writing in Spanish.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of creative writing and the publication process.
5. Students will read and learn about the process and types of creative writing and publication, how to create original texts, and how to edit and publish creating works.

SPAN 412. Spanish-American Poetry**3 Credits (3)**

Study of major works by Spanish-American poets.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the poetry genre.
5. Students will read foundational Hispanic poetry from different periods and learn how poets and poetry create and inform Hispanic histories, identities, and nations.

SPAN 418. Spanish-American Short Story**3 Credits (3)**

Study of major short stories by Spanish-American authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the short story genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 419. Spanish American Drama**3 Credits (3)**

Study of major works by Spanish-American dramatists.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the drama genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 420. The Art of Storytelling**3 Credits (3)**

The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of oral storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 421. New Mexico Culture and Literature**3 Credits (3)**

The study of the development and flourishing of New Mexican culture and literature.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about key cultural, literary, and historical elements of New Mexico.
5. Students will learn how to apply knowledge about New Mexico to serve their communities.

SPAN 422. Cultural Production of Hispanic Revolutions and Wars**3 Credits (3)**

The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form our regional and national identities, especially through a cultural production lens.

SPAN 424. Post-Modern Hispanic Literature**3 Credits (3)**

The study of Post-Modern experimental literary genres, from Post-boom to the present.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of post-modernism, especially in relation to Hispanic literary production.
5. Students will read a variety of post-modern Hispanic texts from various genres and learn how they help develop regional and national identities.

SPAN 426. Spanish-American Novel**3 Credits (3)**

Study of major works by Spanish-American novelists.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the novel genre.
5. Students will read foundational Hispanic novels from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 427. Chicano Literature**3 Credits (3)**

Study of Chicano/US-Mexican authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop advanced comprehension of the terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres, but with a focus on narratives, and learn how they create and sustain a national Chicano consciousness.

SPAN 439. Topics in Applied Spanish Linguistics**3 Credits (3)**

Group study of selected topics to be identified by subtitle in the Schedule of Classes. May be repeated once under different subtitle for a maximum of 6 credits.

Prerequisite: SPAN 340.

SPAN 442. Formation of Hispanic National Identities**3 Credits (3)**

Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 444. Body Studies**3 Credits (3)**

Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 446. Speculative Fiction**3 Credits (3)**

Study of Hispanic speculative fiction and its related utopian/dystopian societies.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 447. Hispanic Film**3 Credits (3)**

Study of major films from Spain and Spanish-America. Restricted to: Main campus only.

SPAN 448. U.S.-Hispanic Film**3 Credits (3)**

Study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 449. Special Problems**1-3 Credits**

Directed reading for graduate students in their specific fields to satisfy language requirement for master's or doctoral programs. May be repeated for a maximum of 6 credits.

SPAN 451. Hispanic Cultures**3 Credits (3)**

Issues in Hispanic cultures of the U.S., Spanish-America and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various modes of Hispanic cultural production and how they create regional and national Hispanic identities.

SPAN 457. Strategies for Teaching Spanish for Heritage/Native Speakers**3 Credits (3)**

Overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers. Taught with SPAN 597.

Prerequisite: SPAN 317 or SPAN 319 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop advanced comprehension of the terms and concepts related to the study and application of Spanish for Heritage/Native Speakers of Spanish.
5. Students will learn how to become more effective teachers of Spanish for Heritage/Native Speakers of Spanish.

SPAN 461. Introduction to Spanish Phonetics**3 Credits (3)**

An introduction to Spanish phonetics including basic dialectal variation and comparison with English.

Prerequisite: SPAN 340.

SPAN 474. Pragmatics**3 Credits (3)**

The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.

Prerequisite(s): SPAN 340.

SPAN 476. Semantics**3 Credits (3)**

The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.

Prerequisite(s): SPAN 340.

SPAN 483. Literature and Law**3 Credits (3)**

The advanced study of Latin American and Latino literature and its historical and cultural connections to the development of laws and the influence of both on modern society.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of legal themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies legal issues that affect the Hispanic community.

SPAN 485. Literature and Mental Health**3 Credits (3)**

The advanced study of Latin American and Latino literature and how storytelling, through various literary genres, can inform our understanding of mental health issues and propose possible solutions to improve our quality of mental health.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of mental health themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies mental health issues that affect the Hispanic community.

SPAN 490. Special Topics**3 Credits (3)**

Selected topic to be identified by subtitle in the Schedule of Classes.

Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various topics of Hispanic literature or linguistics that can be applied to advanced research projects.

SPAN 491. History of the Spanish Language**3 Credits (3)**

The development of Spanish from its origins.

Prerequisite(s): SPAN 340.

SPAN 492. Structure of Spanish**3 Credits (3)**

Topics in Spanish linguistics including phonology, morphology, syntax and semantics.

Prerequisite: SPAN 316 or SPAN 318 or SPAN 340.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to the structure of Spanish.
5. Students will learn about the formation of the structure of Spanish and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 493. Espanol de los Estados Unidos**3 Credits (3)**

Linguistic issues and studies of U.S. Spanish-speaking communities. Taught with SPAN 593. May be repeated up to 3 credits.

Prerequisite(s): SPAN 340.

SPAN 500. Methods of Research and Literary Criticism**3 Credits (3)**

Advanced methods of research and literary criticism.

SPAN 507. Technology Enhanced Language Learning**3 Credits (3)**

Strategies for enhancing language learning with emerging technologies. Course is taught in Spanish.

SPAN 508. Teaching Literature with Technology**3 Credits (3)**

Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/
Prerequisite(s): SPAN 507, and/or consent of instructor.

SPAN 509. Teaching Culture with Technology**3 Credits (3)**

Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/

Prerequisite(s): SPAN 507, and/or consent of instructor.

SPAN 510. Assessing the National Standards**3 Credits (3)**

Analysis of the National Standards for Foreign Language Learning (the 5 Cs) in the 21st Century. Course will also cover the Integrated Performance Assessment as applied to the national standards. Other assessments will be reviewed to evaluate effectiveness in all levels of Spanish language classrooms.

SPAN 512. Contemporary Spanish-American Poetry**3 Credits (3)**

Readings and interpretation of Spanish-American poetry from the 20th century to the present.

SPAN 520. Adv. The Art of Storytelling**3 Credits (3)**

The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts of storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 521. Advanced Culture and Literature of New Mexico**3 Credits (3)**

The advanced study of the development and flourishing of New Mexican culture and literature.

SPAN 522. Adv. Cultural Production of Hispanic Revolutions and Wars**3 Credits (3)**

The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form regional and national identities, especially through a cultural production lens

SPAN 528. Advanced U.S. Latino Culture and Literature**3 Credits (3)**

The advanced study of major works by Latino writers in the U.S.

SPAN 540. Introduccion a la Linguistica**3 Credits (3)**

Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change.

Prerequisite(s): Eligibility to take graduate level courses.

SPAN 542. Adv. Formation of Hispanic National Identities**3 Credits (3)**

Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 544. Adv. Body Studies**3 Credits (3)**

Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 545. Advanced Dialectos del Espanol**3 Credits (3)**

Advanced research of Spanish dialects including their formal characteristics, historical formation and regional variation.

SPAN 546. Adv. Speculative Fiction**3 Credits (3)**

Study of Hispanic speculative fiction and its related utopian/dystopian societies.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 547. Advanced Hispanic Film**3 Credits (3)**

Advanced study of major films from Spain and Spanish-America. Restricted to: Main campus only.

SPAN 548. Advanced U.S.-Hispanic Film**3 Credits (3)**

Advanced study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 550. Advanced Chicana and Chicano Studies**3 Credits (3)**

Multidisciplinary examination of issues that have historically affected/influenced the Chicana/o community regionally, in the borderlands, and beyond borders.

Learning Outcomes

1. Students will become better equipped to teach this material at the high school or community college levels.
2. Students will become better equipped to attend a PhD program in a related field.
3. Students will gain access to a more diverse curriculum which broaden their educational and cultural perspectives.
4. Students will be able to develop their scholarship on a more creative level.
5. Students will strengthen their academic writing, which will help in their graduate studies and/or post-graduate careers.

SPAN 551. Advanced Hispanic Cultures**3 Credits (3)**

Advanced study on Hispanic cultures of the U.S., Spanish-America and/or Spain. Selected topic to be identified by subtitle. Taught with SPAN 451. May be repeated up to 6 credits.

SPAN 552. Advanced Literature of the Mexican Revolution**3 Credits (3)**

Study of Mexican authors dealing with the Mexican Revolution. Restricted to: Main campus only.

SPAN 558. Bilinguismo**3 Credits (3)**

Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence.

Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 561. Advanced Spanish Phonetics**3 Credits (3)**

Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.

SPAN 562. Advanced Spanish Phonology**3 Credits (3)**

An advanced formal examination of the sound system of Spanish including formal characterizations, dialectal variation and laboratory data. May be repeated up to 3 credits.

Prerequisite(s): SPAN 561 or consent of instructor.

SPAN 563. Advanced Study in Mexican Literature**3 Credits (3)**

Mexican literature from the Pre-Columbian period to the present.

SPAN 564. Advanced Post-Modern Hispanic Literature**3 Credits (3)**

The advanced study of Post-Modern experimental literary genres, from Post-boom to the present.

SPAN 566. Contemporary Spanish-American Novel**3 Credits (3)**

The Spanish-American novel from the 20th century to the present.

SPAN 567. Advanced Study in Chicano Literature**3 Credits (3)**

Study of all genres of Chicano literature.

SPAN 570. Advanced Study in Technical Translation**3 Credits (3)**

Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.

SPAN 573. Advanced Study in Creative Writing**3 Credits (3)**

Advanced creative writing in Spanish.

SPAN 574. Advanced Pragmatics**3 Credits (3)**

The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.

Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 576. Advanced Semantics**3 Credits (3)**

The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.

Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 580. Research Methodology in Spanish Linguistics**3 Credits (3)**

Study and practical application of techniques in linguistic research.

SPAN 583. Advanced Study in Spanish-American Women Writers**3 Credits (3)**

All genres of Spanish-American literature written by women. Research paper required.

SPAN 584. Spanish Morphosyntax**3 Credits (3)**

Examination of the morphological and syntactic structure of the Spanish language as well as their interaction. Practical applications are also explored.

SPAN 586. Contemporary Spanish-American Essay**3 Credits (3)**

Main currents in the Spanish-American thought from the 20th century to the present.

SPAN 587. Contemporary Spanish-American Short Story**3 Credits (3)**

The Spanish-American short story from the 20th century to the present.

SPAN 588. Contemporary Spanish-American Drama**3 Credits (3)**

The Spanish-American drama from the 20th century to the present.

SPAN 589. Spanish Sociolinguistics**3 Credits (3)**

Relationship between language and society in the Spanish-speaking world.

SPAN 590. Advanced Special Topics**3 Credits (3)**

Specific subject to be announced in the Schedule of Classes. May be repeated up to 6 credits.

SPAN 591. Advanced Study in History of the Spanish Language**3 Credits (3)**

The development of Spanish from its origins.

SPAN 592. Advanced Structure of Spanish**3 Credits (3)**

Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.

SPAN 594. Theory and Methodology of Spanish Pedagogy**3 Credits (3)**

Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.

SPAN 595. Advanced Topics in Applied Spanish Linguistics**3 Credits (3)**

Selected topics to be identified by subtitle in the Schedule of Classes.

May be repeated for a total of 9 credits under a different subtitle.

SPAN 597. Advanced Strategies for Teaching Spanish for Heritage/Native Speakers**3 Credits (3)**

Advanced overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers.

SPAN 598. Independent Reading, Research, and/or Creative Writing**1-3 Credits**

Individual study of selected readings and problems; or individual research, either analytical or experimental, or creative writing. May be repeated for unlimited credits.

SPAN 599. Master's Thesis**15 Credits**

Thesis.

Phone: (575) 646-4541

Website: <http://www.nmsu.edu/~langling/> (<http://langling.nmsu.edu>)

Foreign Languages (French) - Bachelor of Arts

Departmental Requirements

Single Major in Foreign Languages with a Concentration in French

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are pursuing only a major in Foreign Languages with a Concentration in French are considered single major students. Single major students are required to complete:

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3

ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1130G	Survey of Mathematics ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
LING 2110G	Introduction to the Study of Language and Linguistics	
Area III: Laboratory Sciences Course (4 credits) ²		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ²		
<i>Area V: Humanities</i> ²		
<i>Area VI: Creative and Fine Arts</i> ²		
<i>General Education Elective</i> ²		
Viewing a Wider World ³		
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
<i>Linguistics Requirement</i>		
The Linguistics requirement is completed with LING 2110G which also counts towards Area IV of the General Education requirements		
<i>Select 24 additional credits from FREN courses (300-level or higher) selected with the help of an advisor from the department</i> ⁴		
Second Language Requirement (see below) ⁶		
Electives, to bring the total credits to 120 ⁵		
Total Credits		

120-136

- ¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G Survey of Mathematics first.
- ² See the General Education (p. 220) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ³ See the Viewing a Wider World (p. 224) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ⁴ Entrance into the French sequence is determined by placement. Additional FREN courses may be needed to meet prerequisites of 300+ level GRMN courses.
- ⁵ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁶ The number of credits needed to complete the Second Language Requirement may vary depending on language placement. As well, this requirement may be waived via conditions further described below.

Second Language Requirement

For the Bachelor of Arts in Foreign Languages with a concentration in French there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
CHIN 2120 or GRMN 2120 or JAPN 2120 or SPAN 2120	Mandarin Chinese IV German IV Japanese IV Spanish IV	3
<i>OR</i>		
Challenge the 1120/2210 level for the following courses:		
PORT 1120 or SPAN 2210	Portuguese II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Foreign Languages with a Concentration in French

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a different department can double major in Foreign Languages with a concentration in French. Double major students are required to complete:

Prefix	Title	Credits
General Education (from other major): ¹		32-35
Viewing a Wider World (from other major): ¹		6
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
Select 24 credits from FREN courses (300-level or higher) selected with the help of an advisor from the department		24
Electives, to bring the total credits to 120 ³		58
Total Credits		120-123

¹ General Education and Viewing a Wider World requirements are solidified by completing the requirements for the other major in a different department, as part of the double major program.

² Entrance into the French sequence is determined by placement and some courses may not be needed if a student is placed into a higher level.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better)	3

Elective Course ²		3
FREN 1110	French I (For students who need to complete the lower-division sequence for prereqs.)	
Elective Course ²		3-4
Recommended continuation of the FREN 1110, 1120, 2110, 2120 for students needing placement adjustments		
Select from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course ³		3
LING 2110G	Introduction to the Study of Language and Linguistics (C- or better) ⁴	3
Elective Courses ²		8
Credits		30-31

Sophomore

Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ³		4
Area VI: Creative and Fine Arts Course ³		3
Second Language: Placement Level or HS Waiver (C- or better) ⁴		3-4
Elective Courses ²		6
Recommended continuation of the FREN 1110, 1120, 2110, 2120 for students needing placement adjustments		
General Education Elective Course ³		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course ³		3-4
Second Language: Continued Sequence if no HS Waiver (C- or better) ⁴		3-4
Elective Course ²		2
Credits		30-33

Junior

VWW- Viewing a Wider World Courses ⁵		6
Second Language: Continued Sequence if no HS Waiver (C- or better) ⁴		6
French Upper Division Electives (FREN Courses, C- or better) ⁶		12
Elective Course ²		3
Elective Course (Upper Division) ²		3
Credits		30

Senior

French Upper Division Electives (FREN Courses, C- or better) ⁶		12
Elective Course (Upper Division) ^{2,7}		15
Elective Course ²		3
Credits		30
Total Credits		120-124

¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

² Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

- ³ See the General Education (p. 220) section of the catalog for a full list of courses
- ⁴ Students who double major in Foreign Languages with a concentration in French are not required to take LING 2110G or fulfill a second language requirement.
- ⁵ See the Viewing a Wider World (p. 224) section of the catalog to see a full list of courses, please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.
- ⁶ Upper- Division FREN Credits: 24 credits (300-level or higher) are to be selected with the aid of an academic advisor, please note that FREN 365V does not count towards a FREN Upper-Division Elective course.
- ⁷ FREN 306 may be taken for a maximum of 6 credits towards the degree, but only 3 credits will be accepted from study abroad.

Foreign Languages (German) - Bachelor of Arts

Departmental Requirements

Single Major in Foreign Languages with a Concentration in German

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are only pursuing a major in Foreign Languages with a Concentration in German are considered single major students. Single major students are required to complete:

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1130G	Survey of Mathematics ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
LING 2110G	Introduction to the Study of Language and Linguistics	
Area III: Laboratory Sciences Course (4 credits) ²		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ²		
<i>Area V: Humanities</i> ²		3

<i>Area VI: Creative and Fine Arts</i> ²	3
<i>General Education Elective</i> ²	3-4
Viewing a Wider World ³	6
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)	
Departmental/College Requirements	
<i>Linguistics Requirement</i>	
The Linguistics requirement is completed with LING 2110G which also counts towards Area IV of the General Education requirements	
Select 24 additional credits from GRMN courses (300-level or higher) selected with the help of an advisor from the department ⁴	24
Second Language Requirement (see below) ⁶	0-14
Electives, to bring the total credits to 120 ⁵	58
18 credits must be upper division	
Total Credits	120-136

- ¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
- ² See the General Education (p. 220) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ³ See the Viewing a Wider World (p. 224) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ⁴ Entrance into the German sequence is determined by placement. Additional GRMN courses may be needed to meet prerequisites of 300+ level GRMN courses.
- ⁵ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁶ The number of credits needed to complete the Second Language Requirement may vary depending on language placement. As well, this requirement may be waived via conditions further described below.

Second Language Requirement

For the Bachelor of Arts in Foreign Languages with a concentration in German there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14

JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6

For Heritage Speakers:

SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9
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Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
CHIN 2120	Mandarin Chinese IV	3
or FREN 2120	French IV	
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
<i>OR</i>		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Foreign Languages with a Concentration in German

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a different department can double major in Foreign Languages with a concentration in German. Double major students are required to complete:

Prefix	Title	Credits
General Education (from other major): ¹		32-35
Viewing a Wider World (from other major): ¹		6
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
<i>Select 24 additional credits from GRMN courses (300-level or higher) selected with the help of an advisor from the department</i>		24
Second Language: (not required)		
Electives, to bring the total credits to 120 ³		58
Total Credits		120-123

- ¹ General Education and Viewing a Wider World requirements are solidified by completing the requirements for the other major in a different department, as part of the double major program.
- ² Entrance into the German sequence is determined by placement and some courses may not be needed if a student is placed into a higher level.
- ³ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) ¹	3
Elective Course		3
GRMN 1110	German I (For students who need to complete the lower-division sequence for prereqs.)	
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	

HNRS 2175G	Introduction to Communication Honors	
LING 2110G	Introduction to the Study of Language and Linguistics (C- or better) ⁴	3
Area V: Humanities Course ³		3
Recommended continuation of the GRMN 1110, 1120, 2110, 2120 for students needing placement adjustments.		
Elective Courses ²		11
Credits		30
Sophomore		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ³		4
Area VI: Creative and Fine Arts Course ³		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences ³		3-4
General Education Elective Course ³		3
Second Language: Placement Level or HS Waiver (C- or better) ⁴		3-4
Second Language: Continued Sequence if no HS Waiver (C- or better) ⁴		3-4
Elective Courses		6
Recommended continuation of the GRMN 1110, 1120, 2110, 2120 for students needing placement adjustments.		
Elective Courses ²		2
Credits		30-33
Junior		
VWW- Viewing a Wider World Course ⁵		6
Second Language: Continued Sequence if no HS Waiver (C- or better) ⁴		6
German Upper Division ElectiveS (GRMN Courses, C- or better) ⁶		12
Elective Courses ²		3
Elective Course (Upper Division) ²		3
Credits		30
Senior		
German Upper Division Electives (GRMN Courses, C- or better) ⁶		12
Elective Courses (Upper Division) ²		15
Elective Course ²		3
Credits		30
Total Credits		120-123

¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

² Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

³ See the General Education (p. 220) section of the catalog for a full list of courses

⁴ Students who double major in Foreign Languages with a concentration in German are not required to take LING 2110G or fulfill a second language requirement.

⁵ See the Viewing a Wider World (p. 224) section of the catalog to see a full list of courses, please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.

⁶ Upper- Division GER Credits: 24 credits (300-level or higher) are to be selected with the aid of an academic advisor.

Foreign Languages (Spanish) - Bachelor of Arts

Departmental Requirements

Single Major in Foreign Languages with a Concentration in Spanish

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are only pursuing a major in Foreign Languages with a concentration in Spanish are considered single major students. Single major students are required to complete:

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1130G	Survey of Mathematics ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
LING 2110G	Introduction to the Study of Language and Linguistics (linguistics requirement for major)	
Area III: Laboratory Sciences Course (4 credits) ²		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i> ²		3
Viewing a Wider World ³		6
These courses do not satisfy this requirement: (FREN 365V, LING 302V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
<i>Linguistics Requirement</i>		3
The Linguistics requirement is completed with LING 2110G which also counts towards Area IV of the General Education requirements		
<i>Departmental Requirements</i>		
SPAN 316	Grammar for Non-Native Speakers of Spanish ⁴	3

or SPAN 318	Grammar for Heritage/Native Speakers of Spanish	
SPAN 317	Composition for Non-Native Speakers of Spanish ⁴	3
or SPAN 319	Composition for Heritage/Native Speakers of Spanish	
SPAN 340	Introduction to Spanish Linguistics ⁴	3
SPAN 380	Introduction to Hispanic Literature ⁴	3
SPAN Upper-Division Electives ^{4, 5}		12
Second Language Requirement (see below) ⁸		0-14
Electives (to bring the total credits to 120) ⁶		55
Total Credits		120-135

- ¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
- ² See the General Education (p. 220) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ³ See the Viewing a Wider World (p. 224) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ⁴ Entrance into the Spanish sequence is determined by placement. Additional SPAN courses may be needed to meet prerequisites of 300+ level SPAN courses.
- ⁵ SPAN 364V and SPAN 365V will not count toward the major.
- ⁶ Both SPAN 340 Introduction to Spanish Linguistics and SPAN 380 Introduction to Hispanic Literature must be taken.
- ⁷ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁸ The number of credits needed to complete the Second Language Requirement may vary depending on language placement. As well, this requirement may be waived via conditions further described below.

Second Language Requirement

For the Bachelor of Arts in Foreign Languages with a concentration in Spanish there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14

JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
CHIN 2120 or FREN 2120 or GRMN 2120 or JAPN 2120	Mandarin Chinese IV French IV German IV Japanese IV	3
<i>OR</i>		
Challenge the 1120/2210 level for the following courses:		
PORT 1120 or SPAN 2210	Portuguese II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Foreign Languages with a Concentration in Spanish

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a different department can double major in Foreign Languages with a concentration in Spanish. Double major students are required to complete:

Prefix	Title	Credits
General Education (from other major): ¹		36
Viewing a Wider World (from other major): ¹		6
These courses do not satisfy this requirement: (FREN 365V, LING 302V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
SPAN 316	Grammar for Non-Native Speakers of Spanish	3
or SPAN 318	Grammar for Heritage/Native Speakers of Spanish	
SPAN 317	Composition for Non-Native Speakers of Spanish	3
or SPAN 319	Composition for Heritage/Native Speakers of Spanish	
SPAN 340	Introduction to Spanish Linguistics	3
SPAN 380	Introduction to Hispanic Literature	3
SPAN Upper-Division Electives		12
Electives (to bring the total credits to 120) ⁴		54
Total Credits		120

¹ General Education and Viewing a Wider World requirements are solidified by completing the requirements for the other major in a different department, as part of the double major program.

² Entrance into the Spanish sequence is determined by placement; some courses may not be needed if a student is placed into a higher level.

³ SPAN 364V Culture and Civilization of Mexico and **SPAN 365V Culture and Civilization of Spanish America** will not count toward the double major.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) ¹	3
SPAN 1110	Spanish I (For students who need to complete the lower-division sequence for prereqs.)	
Elective Courses or UNIV 150 ²		6
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course ³		3

LING 2110G	Introduction to the Study of Language and Linguistics (C- or better) ⁴	3
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Recommended continuation of the SPAN 1110, 1120, 2110, 2120 for students needing placement adjustments	
Elective Courses ²	8

Credits		30
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Sophomore

Select one from the following:

ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	

Area III: Laboratory Science Course ³	4
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Area VI: Creative and Fine Arts Course ³	3
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Second Language: Placement Level or HS Waiver (C- or better) ⁴	3-4
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Recommended continuation of the SPAN 1110, 1120, 2110, 2120 for students needing placement adjustments

Second Language: Continued Sequence if no HS Waiver (C- or better) ⁴	3-4
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General Education Elective Course ³	3
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Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course ³	3-4
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Elective Course ²	8
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Credits		30-33
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Junior

Second Language: Continued Sequence if no HS Waiver (C- or better) ⁴	6
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SPAN 316 or SPAN 318	Grammar for Non-Native Speakers of Spanish ^{6,8} or Grammar for Heritage/Native Speakers of Spanish	3
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SPAN 317 or SPAN 319	Composition for Non-Native Speakers of Spanish ^{7,8} or Composition for Heritage/Native Speakers of Spanish	3
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SPAN 340 or SPAN 380	Introduction to Spanish Linguistics (C- or better) ^{8,9} or Introduction to Hispanic Literature	3
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SPAN 380 or SPAN 340	Introduction to Hispanic Literature (C- or better) ^{8,9} or Introduction to Spanish Linguistics	3
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VWW- Viewing a Wider World Courses ⁵	6
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Elective Course (Upper Division) ²	3
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Elective Courses ²	3
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Credits		30
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Senior

Upper-Division Spanish Electives	6
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SPAN Electives - SPAN 300-level or higher (C- or better) ⁸	6
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Elective Courses (Upper Division) ²	15
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Elective Courses ²	3
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Credits		30
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Total Credits		120-123
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¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

² Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

- ³ See the General Education (p. 220) section of the catalog for a full list of courses
- ⁴ Students who double major in Foreign Languages with a concentration in French are not required to take LING 2110G or fulfill a second language requirement.
- ⁵ See the Viewing a Wider World (p. 224) section of the catalog to see a full list of courses, please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.
- ⁶ Credit will not be given for both SPAN 316 and SPAN 318
- ⁷ Credit will not be given for both SPAN 317 and SPAN 319
- ⁸ A total of 24 credits of Upper-Division Spanish is required
- ⁹ Both SPAN 340 and SPAN 380 must be taken

Linguistics - Bachelor of Arts

Departmental Requirements

Single Major in Linguistics

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

The strong interdisciplinary nature of the major in Linguistics lends itself to combining with other programs. Students fulfilling the requirements for the major in Linguistics are encouraged to complete either a minor or an additional major to enhance their academic pursuits.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1130G	Survey of Mathematics ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
LING 2110G	Introduction to the Study of Language and Linguistics (requirement for major)	10-11
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
<i>Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective ²</i>		3-4
Viewing a Wider World ³		6

These courses do not satisfy this requirement:

(GRMN 333V, FREN 365V, LING 302V, SPAN 364V, SPAN 365V)

Departmental/College Requirements

Linguistics Sequence

LING 302V	Language and Society	3
LING 303	Exploring Language Systems	3
Select from one of the following:		3
LING 301	Introduction to Psycholinguistics	
or PSYC 301	Introduction to Psycholinguistics	
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 451	Independent Studies in Linguistics	
LING 455	Research in Linguistics (Required for single majors)	3

Electives

Select 12 credits from the following:		12
ANTH 320	Anthropological Linguistics	
BLED 4110	Second Language Acquisition	
SIGN 1110	American Sign Language I	
SIGN 1120	American Sign Language II	
SIGN 2110	American Sign Language III	
C S 370	Compilers and Automata Theory	
C S 409	Independent Study	
C S 466	Compilers and Automata Transition	
C S 471	Programming Language Structure I	
C S 479	Special Topics	
COMM 305	Communication Research Methods	
COMM 351	Persuasion Theory and Practice	
COMM 370	Organizational Communication	
COMM 376	Communication and Culture	
COMM 377	Conflict Management	
COMM 384	Interpersonal Communication	
COMM 425	Small Group Communication	
COMM 440	Political Communication	
COMM 450	Technologies of Human Communication	
COMM 457	Strategic Communication	
COMM 460	Deception and Communication	
COMM 462	Family Communication	
COMM 465	Nonverbal Communication	
COMM 470	Leadership Communication	
COMM 471	Sports Communication	
COMM 475	International Communication	
COMM 477	Environmental Communication	
COMM 480	Health Communication	
COMM 490	Independent Study	
COMM 491	Selected Topics	
COMM 495	Communication Internship	
FREN 352	French Phonetics	
FREN 451	Special Topics in French	
GRMN 451	Special Topics in German	
GRMN 453	Independent Studies in German	
LING 405	Topics in Linguistics	
LING 451	Independent Studies in Linguistics	
PHIL 312	Formal Logic	
PHIL 315	Philosophy of Language	
PHIL 346	Philosophy of Mind	

PORT 453	Independent Luso-Brazilian Studies	
PSYC 301	Introduction to Psycholinguistics	
PSYC 401	Directed Readings	
SPAN 330	Variations in Spanish	
SPAN 340	Introduction to Spanish Linguistics	
SPAN 393	Introduction to Translation and Interpretation	
SPAN 399	Independent Studies in Literature, Language, or Culture	
SPAN 439	Topics in Applied Spanish Linguistics	
SPAN 461	Introduction to Spanish Phonetics	
SPAN 474	Pragmatics	
SPAN 476	Semantics	
SPAN 490	Special Topics	
SPAN 491	History of the Spanish Language	
SPAN 492	Structure of Spanish	
SPAN 493	Espanol de los Estados Unidos	
SPED 4340	Communication and Autism	
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	
SPHS 4510	Phonetics	
SPHS 4620	Speech and Hearing Science	
SPHS 4710	Speech Disorders Across the Lifespan	
SPHS 4520	Audiology	
SPHS 4820	Neural Bases of Communication Disorders	
Second Language Requirement (required - see below)		0-14
Electives (to bring the total credits to 120) ⁴		43-58
Total Credits		120-121

- ¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
- ² See the **General Education** Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ³ See the **Viewing a Wider World** Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ⁴ Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Linguistics, there is a two-year second language requirement. The options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
<i>Chinese</i>		

CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV
<i>French</i>	
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV
<i>German</i>	
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV
<i>Japanese</i>	
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV
<i>Portuguese</i>	
PORT 1110 & PORT 1120	Portuguese I and Portuguese II
<i>Spanish</i>	
For Non-heritage Speakers	
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV
For Heritage Speakers	
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III

Option 2:

Prefix	Title	Credits
<i>Complete the following sequence for American Sign Language (with a C- or better):</i>		
SIGN 1110 & SIGN 1120 & SIGN 2110	American Sign Language I and American Sign Language II and American Sign Language III	9

Option 3:

Prefix	Title	Credits
<i>Challenge one of the following courses:</i>		
CHIN 2120 or FREN 2120 or GRMN 2120 or JAPN 2120 or PORT 1120 or SPAN 2120 or SPAN 2210	Mandarin Chinese IV French IV German IV Japanese IV Portuguese II Spanish IV Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native-American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Linguistics

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a separate field of study can double major in Linguistics and this program may be serve students by completing this program as a double major. Double major students are required to complete the same course sequence as single majors in Linguistics except that there is no requirement to take LING 455 or similar Linguistics course with a research component, rather this is an option for double majors in Linguistics. At least 3 elective credits must be at the 400 level. No more than 6 credits may be from the department where the student is obtaining his/her major.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I and MATH 1130G Survey of Mathematics. The contents and order of this roadmap may vary depending on initial student placement in English and Mathematics. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I	4
MATH 1130G	Survey of Mathematics ¹	3
Second Language: Placement Level or HS Waiver (C- or better) ⁴		3-4
Area 1: Communications		3
Select one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
LING 2110G	Introduction to the Study of Language and Linguistics ⁴	3
Continued Language Sequence (C- or better)		3-4
Area V: Humanities Course ³		3

Elective Courses ²		8
Credits		30-32
Sophomore		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course ³		4
Area VI: Creative and Fine Arts Course ³		3
Continued Language sequence (or al elective if the sequence is completed (C- or better)		6
Select one from the following:		3
LING 301	Introduction to Psycholinguistics	
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 451	Independent Studies in Linguistics	
PSYC 301	Introduction to Psycholinguistics	
General Education Elective Course ³		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course ³		3-4
LING 302V	Language and Society	3
Elective Courses ²		2
Credits		30-31
Junior		
Viewing a Wider World Courses ³		6
LING 303	Exploring Language Systems	3
Linguistics Elective Courses (select from list)		9
Elective Course (Upper Division) ²		6
Elective Courses ²		6
Credits		30
Senior		
Linguistics Elective Courses (select from list)		6
LING 455	Research in Linguistics	3
Elective Course (Upper-Division) ²		18
Elective Courses ²		3
Credits		30
Total Credits		120-123

¹ MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

² Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

³ See the General Education section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World section of the catalog to see a full list of courses. Please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.

East Asian Studies - Undergraduate Minor

Prefix	Title	Credits
Language Proficiency		6
All Students must reach a second-year proficiency in Japanese or Chinese. completion of JAPN 2120 or CHIN 2120 or higher will satisfy that requirement. The minimum of 6 credits in language is taken from the below-listed courses:		
CHIN 2110	Mandarin Chinese III	
CHIN 2120	Mandarin Chinese IV	
CHIN 311	Advanced Chinese Language I	
CHIN 312	Advanced Chinese Language II	
JAPN 2110	Japanese III	
JAPN 2120	Japanese IV	
JPNS 320	Oral Practicum in Japanese	
JPNS 453	Independent Studies in Japanese	
Cultural, Professional Courses		12
The remaining 12 credits can be completed in at least two of the following departments.		
At least 9 credits of those credits from the following and no more than 3 credits from the Non-Asian Studies courses.		
ANTH 307V	Japanese Culture and Society: Anthropological Perspectives	
ARTH 311	Art of China I: Neolithic to Song Dynasty	
ARTH 312	Art of China II: Song Dynasty to Today	
GNDR 474	Gender in East Asian History	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
HIST 321V	History of Korea	
HIST 323	Cultural History of Later Imperial China	
HIST 404	Special Topics in Asian History	
HIST 471	China through the Ming Dynasty	
HIST 472	China in the Modern World	
HIST 473	History of Japan	
HIST 474	Gender in East Asian History	
HNRS 2141G	Bamboo and Silk: The Fabric of Chinese Literature	
HNRS 390V	Worlds of Buddhism	
Non-Asian Studies courses		
COMM 376	Communication and Culture	
COMM 475	International Communication	
I B 398	International Business and Economic Environments	
POLS 360	International Relations Theory	
Total Credits		18

French - Undergraduate Minor

Students must pass at least 18 credits of FREN courses of which at least 12 credits are upper division. Students may not count FREN 1110 French I or FREN 1120 French II, but may count FREN 2110 French III and/or FREN 2120 French IV. A student whose primary language for a Bachelor of Arts in Foreign Languages is French may not also earn a minor in French.

Prefix	Title	Credits
Required Courses		
Select at least 18 credits of FREN courses of which at least 12 credits are upper division		18
Total Credits		18

German - Undergraduate Minor

Students must pass at least 18 credits of GER courses of which at least 12 credits are upper division. Students may not count GRMN 1110 German I or GRMN 1120 German II, but may count GRMN 2110 German III and/or GRMN 2120 German IV. A student whose primary language for a Bachelor of Arts in Foreign Languages is German may not also earn a minor in German.

Prefix	Title	Credits
Required Courses		
Select at least 18 credits of GRMN courses of which at least 12 credits are upper division		18
Total Credits		18

International Studies - Undergraduate Minor

A minor in International Studies consists of 18 credit hours of approved interdisciplinary course work of which at least 12 are upper division (300 level or above). No more than 3 credits of Independent Study may be applied to the minor and only 2 courses (6 credits) may be double counted with the course of the student's major(s). Students must maintain a minimum 2.5 GPA.

Prefix	Title	Credits
Required Coursework		
Other courses, than those listed below, may be substituted if approved by advisor and Dept of Languages and Linguistics.		
<i>Introductory Course:</i>		
ANTH 1140G	Introduction to Cultural Anthropology	3
or HNRS 2165G	Introduction to Humanities in the 21st Century	
<i>International Experience:</i>		
Faculty led programs or semester abroad.		
ARSC 3130	Faculty Led International Travel	3
<i>Culture/Arts/Humanities:</i>		
Choose one from the following:		3
ANTH 330V	Magic Witchcraft and Religion	
ANTH 360V	Food and Culture Around the World	
COMM 376	Communication and Culture	
COMM 475	International Communication	
ENGL 2650G	World Literature I	
FREN 378	Studies in Francophone Cultures	
FREN 478	Studies in Francophone Cultures Around the World	
GNDR 2120G	Representing Women Across Cultures	
GRMN 350	Introduction to German Literature	
PHIL 332	Ethics and Global Poverty	
SOCI 4240V	Comparative Global Family Systems	
SOCI 4460	Globalization	
SPAN 380	Introduction to Hispanic Literature	
SPAN 451	Hispanic Cultures	
GNDR 401	Women & Immigration	

GNDR 402	Transnational Feminisms
GNDR 454	Women Crossing Borders
<i>History/Geography:</i>	
Choose one from the following:	
3	
GEOG 1120G	World Regional Geography
GEOG 1130G	Human Geography
GEOG 363V	Cultural Geography
HIST 1130G	World History I
HIST 1140G	World History II
HIST 2250G	East Asia to 1600
or HIST 2251G	East Asia since 1600
HIST 2245G	Islamic Civilization to 1500
or HIST 2246G	Islamic Civilizations since 1800
HIST 312V	Modern Latin America
HIST 474	Gender in East Asian History
<i>Government/Politics/Economics:</i>	
Choose one from the following:	
3	
ECON 324V	Developing Nations
FREN 330	Business French
GRMN 330	Business German
I B 317	International Marketing
I B 398	International Business and Economic Environments
I B 450	International Economics
I B 475	International Finance
MGMT 458	Comparative International Management
MKTG 317	International Marketing
POLS 2120G	International Relations
POLS 313	Model United Nations
POLS 335	Management of Nonprofit Organizations
POLS 360	International Relations Theory
POLS 361	International Relations Theory
POLS 362	International Political Economy
POLS 366	American Foreign Policy
POLS 396	International Law
POLS 469	Globalization
<i>Health/Education/Environment:</i>	
Choose one from the following:	
3	
AEEC 315V	World Agriculture and Food Problems
ANSC 351V	Agricultural Animals of the World
ANTH 360V	Food and Culture Around the World
AXED 4110	Management of Change, Diffusion, and Adoption of Innovations
ECON 337V	Natural Resource Economics
EDUC 3120	Multicultural Education
FWCE 1110G	Introduction to Natural Resources Management
POLS 335	Management of Nonprofit Organizations
PHLS 3130V	Global Environmental Health Issues
PHLS 3210	Foundations of Community Health Education
PHLS 4630	International Health Problems
SOCI 4240V	Comparative Global Family Systems
Total Credits	
18	

Linguistics - Undergraduate Minor

The department offers a minor in linguistics.

Prefix	Title	Credits
Required Courses		
LING 2110G	Introduction to the Study of Language and Linguistics	3
Select two from the following:		6
LING 301 or PSYC 301	Introduction to Psycholinguistics	
LING 302V	Language and Society	
LING 303	Exploring Language Systems	
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 451	Independent Studies in Linguistics	
LING 455	Research in Linguistics	
Select 9 credits with the help of an advisor from related fields ¹		9
Total Credits		18

¹ See list of electives for the supplementary major in Linguistics.

Spanish - Undergraduate Minor

Students must pass at least 18 credits of SPAN courses of which at least 12 credits are at either the 300 or 400 level. Students may not count SPAN 1110 Spanish I, SPAN 1120 Spanish II and SPAN 1210 Elementary Spanish for Heritage Learners I, but may count SPAN 2110 Spanish III and/or SPAN 2120 Spanish IV or SPAN 1220 Spanish for Heritage Learners II and/or SPAN 2210 Spanish for Heritage Learners III. A student whose primary language for a Bachelor of Arts in Foreign Languages is Spanish may not also earn a minor in Spanish.

Prefix	Title	Credits
Required Courses		
SPAN 316 or SPAN 318	Grammar for Non-Native Speakers of Spanish Grammar for Heritage/Native Speakers of Spanish	3
SPAN 317 or SPAN 319	Composition for Non-Native Speakers of Spanish Composition for Heritage/Native Speakers of Spanish	3
Electives		
Additional 12 SPAN credits of which at least 6-credits are upper-division ¹		12
Total Credits		18

¹ SPAN 364V Culture and Civilization of Mexico and SPAN 365V Culture and Civilization of Spanish America do not count for a minor in Spanish as they are taught in English.

Latin American Studies - Supplemental Major

This program consists of 24 credits drawn from the lists below of which 18 credits must be numbered 300 or above. In addition, students must satisfy the College of Arts and Sciences Second Language Requirement.

Options

There are two options based on the section chosen by the student:

Option 1

Concentration in Latin American Language, Culture and Literature (Spanish or Portuguese):

- 12 credits from Section 1
- 12 credits from Section 2, (*Note: No more than 6 credits may be taken in a single department*)

Option 2

Concentration in one major (e.g., history, government, economics, health science, anthropology, sociology) included in Latin American Social Sciences and Art:

- 12 credits in the chosen area of Section 2
- 6 credits from another area (or areas) of Section 2
- 6 credits from Section 1

Both options require that the student take at least two Spanish or Portuguese courses above 300-level.

Section 1: Latin American Language, Culture and Literature

Only 3 credits will count.

Prefix	Title	Credits
Spanish/Portuguese Language		
Select one from the following:		3
SPAN 325	Advanced Conversation	
SPAN 327	Spanish in the Community	
PHLS 4610	Health Disparities: Determinants and Interventions	
Culture		
SPAN 305	Topics in Hispanic Civilization	3
SPAN 306	Special Topics	3
SPAN 491	History of the Spanish Language	3
Literature		
SPAN 388	Contemporary Hispanic Literature	3

Section 2: Latin American Social Sciences and Art

Prefix	Title	Credits
Course List		
ANTH 306V	Peoples of Latin America	3
ANTH 312	The Ancient Maya	3
ANTH 313V	Ancient Mexico	3
ARTH 344	Gender, Sexuality, and Art in the Americas	3
ECON 324V	Developing Nations	3
GEOG 328V	Environments of Latin America	3
POLS 371	Latin American Politics	3
POLS 378	U.S.-Mexico Border Politics	3
POLS 379	Mexican Politics	3
HIST 311V	Colonial Latin America	3
HIST 312V	Modern Latin America	3
HIST 331	Rebels, Guerrillas, and Terrorists in Modern Latin America	3
HIST 356	The Mexican Revolution	3

HIST 387	Spain in the New World: Conquest, Conflict, and Cultural Exchange	3
HIST 453	Cuba: Colony to Castro	3
PHLS 4630	International Health Problems	3
PHLS 4660	U.S.-Mexico Border Health Issues	3
PORT 453	Independent Luso-Brazilian Studies	1-3
SOCI 3310V	Social Issues in the Rural Americas	3
SPAN 364V	Culture and Civilization of Mexico	3
SPAN 365V	Culture and Civilization of Spanish America	3
SPAN 412	Spanish-American Poetry	3
SPAN 418	Spanish-American Short Story	3
SPAN 419	Spanish American Drama	3
SPAN 421	New Mexico Culture and Literature	3
SPAN 422	Cultural Production of Hispanic Revolutions and Wars	3
SPAN 424	Post-Modern Hispanic Literature	3
SPAN 426	Spanish-American Novel	3
SPAN 447	Hispanic Film	3

In both sections, independent studies, honors or special topics courses may be chosen with the approval of the Supplementary Major in Latin American Studies advisor, the head of the Department of Languages and Linguistics, and the College of Arts and Sciences. As departments add new courses they may be included in the program.

Chicano Studies - Supplemental Major

This program consists of 24 credits from the lists below. Advisor: Dr. Spencer R. Herrera, Languages and Linguistics.

Prefix	Title	Credits
Core Requirements		
Select three from the following:		9
SPAN 327	Spanish in the Community	
SPAN 448	U.S.-Hispanic Film	
SOCI 4420	Sociology of Latinos/as in the United States	
SPAN 350	Introduction to Chicano Studies	
Culture and Literature		
Select two from the following:		6
ENGL 339V	Chicana/o Literature	
ENGL 394V	Southwestern Literature	
ENGL 458	Latino/a Literature and Culture	
SPAN 361	US-Mexico Border Culture & Literature	
SPAN 385	Introduction to Chicano/US-Mexican Literature	
SPAN 427	Chicano Literature	
SPAN 451	Hispanic Cultures	
Applicable upper-division honors courses		
Applicable upper-division "special topics" courses		
Social Studies		
Select 6 credits from the following:		6
CJUS 414	Race, Crime and Justice	
POLS 378	U.S.-Mexico Border Politics	
POLS 399	New Mexico Law	
HIST 2110	Survey of New Mexico History	
HIST 400	Special Topics	
SOCI 3410	Race and Ethnic Relations	
SPAN 361	US-Mexico Border Culture & Literature	

SPAN 493	Espanol de los Estados Unidos	
Applicable upper-division honors courses		
Applicable upper-division "special topics" courses		
Electives		
Select one from the following:		3
ANTH 313V	Ancient Mexico	
CEPY 5130	Multicultural Counseling	
EDUC 3120	Multicultural Education	
ENGL 394V	Southwestern Literature	
GEOG 325V	New Mexico and the American West	
POLS 399	New Mexico Law	
HIST 311V	Colonial Latin America	
HIST 483	Historic Preservation	
PHLS 4660	U.S.-Mexico Border Health Issues	
SPAN 457	Strategies for Teaching Spanish for Heritage/ Native Speakers	
GNDR 454	Women Crossing Borders	
Total Credits		24

¹ Only with prior written permission of instructor, department head and course dean.

Independent study, honors or special topics courses may be chosen with the approval of the advisor for Supplementary Majors in Chicano Studies, the head of the Department of Languages and Linguistics, and the College of Arts and Sciences. As departments add new courses they may be included in the program.

Linguistics - Supplemental Major

This program consists of 24 credits drawn from the lists below. In addition, students must satisfy the College of Arts and Sciences Second Language Requirement.

Prefix	Title	Credits
Core Requirements		
LING 2110G	Introduction to the Study of Language and Linguistics	3
LING 302V	Language and Society	3
LING 303	Exploring Language Systems	3
One additional LING course to be selected from the following:		3
LING 301 or PSYC 301	Introduction to Psycholinguistics	
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 455	Research in Linguistics	
Electives		
Select 12 credits from the following: ¹		12
ANTH 320	Anthropological Linguistics	
BLED 4110	Second Language Acquisition	
C S 370	Compilers and Automata Theory	
C S 409	Independent Study ²	
C S 466	Compilers and Automata Transition	
C S 471	Programming Language Structure I	
C S 479	Special Topics ²	
COMM 305	Communication Research Methods	
COMM 310	Communication Theory and Discovery	

COMM 351	Persuasion Theory and Practice	
COMM 370	Organizational Communication	
COMM 376	Communication and Culture	
COMM 377	Conflict Management	
COMM 384	Interpersonal Communication	
COMM 425	Small Group Communication	
COMM 440	Political Communication	
COMM 450	Technologies of Human Communication	
COMM 457	Strategic Communication	
COMM 460	Deception and Communication	
COMM 462	Family Communication	
COMM 465	Nonverbal Communication	
COMM 471	Sports Communication	
COMM 477	Environmental Communication	
COMM 495	Communication Internship	
COMM 475	International Communication	
COMM 480	Health Communication	
COMM 490	Independent Study ²	
COMM 491	Selected Topics ²	
FREN 352	French Phonetics	
FREN 451	Special Topics in French	
GRMN 451	Special Topics in German	
GRMN 453	Independent Studies in German	
LING 451	Independent Studies in Linguistics ²	
PHIL 312	Formal Logic	
PHIL 315	Philosophy of Language	
PHIL 346	Philosophy of Mind	
PORT 453	Independent Luso-Brazilian Studies ²	
PSYC 401	Directed Readings	
SPAN 340	Introduction to Spanish Linguistics	
SPAN 439	Topics in Applied Spanish Linguistics	
SPAN 461	Introduction to Spanish Phonetics	
SPAN 491	History of the Spanish Language	
SPAN 492	Structure of Spanish	
SPAN 493	Espanol de los Estados Unidos	
SPED 4340	Communication and Autism	
SPHS 4510	Phonetics	
SPHS 4520	Audiology	
SPHS 4610	Language Acquisition	
SPHS 4620	Speech and Hearing Science	
SPHS 4710	Speech Disorders Across the Lifespan	
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	
SPHS 4820	Neural Bases of Communication Disorders	
Total Credits		24

¹ At least 3 hours must be at the 400 level. No more than 6 hours may be from the department where the student is obtaining his/her major.

² All Independent Study, Special topic, or Directed Reading courses must be approved by the Department of Languages and Linguistics to count toward Supplementary Major.

Mathematical Sciences

Undergraduate Program Information

In addition to meeting University and College requirements, students earning a Bachelor of Science in Mathematics must fulfill the core departmental requirements and choose from one of six emphases:

- General,
- Applied Mathematics,
- Actuarial Science and Insurance,
- Foundations,
- Secondary Mathematics Education or
- Probability and Statistics.

Students must earn a grade of C- or better in all departmental and nondepartmental courses for any degree in the Department of Mathematical Sciences.

Math Sequence Information and Recommendations

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G Calculus and Analytic Geometry I - MATH 1521G Calculus and Analytic Geometry II - MATH 2530G Calculus III. The calculus sequence, MATH 1531 Introduction to Higher Mathematics, and MATH 2415 Introduction to Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

Students planning to enter a graduate program in Mathematics should select the General Emphasis. In any case, such students are strongly advised to take both MATH 331 Introduction to Modern Algebra and MATH 332 Introduction to Analysis, since these courses are required by most programs, and should take as many as possible of the following courses

Prefix	Title	Credits
MATH 456	Abstract Algebra I: Groups and Rings	3
MATH 481	Advanced Linear Algebra	3
MATH 491	Introduction to Real Analysis I	3
MATH 492	Introduction to Real Analysis II	3

Graduate Program Information

The Department of Mathematical Sciences offers graduate instruction leading to the Master of Science degree, and Doctor of Philosophy degree. Possible areas of study are various topics in pure mathematics and applied mathematics, statistics and mathematics education. Students may also pursue an interdisciplinary program of study. Most graduate students in Mathematical Sciences are supported either through teaching assistantships, research assistantships, fellowships, or job opportunities at nearby teaching or research units.

For more information on our programs and facilities, and to learn more about the research interests of the faculty, please see our web site at <https://math.nmsu.edu/>, phone us at (575) 646-3901, or write to:

Graduate Secretary
Department of Mathematical Sciences
NMSU
Las Cruces, NM 88003-8001
Email: gradcomm@nmsu.edu

Students applying for regular admission to graduate study in mathematics are expected to have 24 credits of upper-division courses in mathematics and statistics, including three-credit proof based courses in modern analysis and in modern algebra. Students who do not meet these requirements may be admitted with deficiencies and allowed to complete the requirements at New Mexico State University.

Applications must be submitted online, see <http://prospective.nmsu.edu/graduate/apply/> (<http://admissions.nmsu.edu/apply/>). The minimum application to be admitted as a regular graduate student in mathematics includes:

1. a completed Graduate School admission application
2. complete transcripts of all undergraduate and graduate work
3. application fee
4. three letters of recommendation from professors, employers, or others who are qualified to judge potential for graduate work in mathematics
5. a one-page statement of educational objectives

Although GRE subject test scores are not required for admission, applicants are encouraged to submit them, if available. The test scores may be used to help allocate available teaching assistantships among entering students.

To ensure full consideration for admission, candidates should submit their applications by the following deadlines.

Application Deadlines-Domestic Applicants

Semester	Admission Only	Admission/Financial Aid
Fall	July 1	February 1
Spring/Summer	October 1	October 1

Application Deadlines-International Applicants

Semester	Admission Only	Admission/Financial Aid
Fall	February 1	February 1
Spring/Summer	October 1	October 1

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Applied Mathematics - Supplemental Major (p. 764)
- Mathematics (Actuarial Science and Insurance) - Bachelor of Science (p. 760)
- Mathematics (Applied Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/applied-mathematics-bachelor-science/>)
- Mathematics (Foundations) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/foundations-bachelor-science/>)
- Mathematics (General Mathematics) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/mathematical-sciences/general-bachelor-science/>)
- Mathematics (Probability and Statistics) - Bachelor of Science (p. 763)
- Mathematics (Secondary Mathematics Education) - Bachelor of Science (<http://catalogs.nmsu.edu/nmsu/arts-sciences/>)

mathematical-sciences/secondary-math-education-bachelor-science/)

Master Degree(s)

- Mathematics - Master of Science (p. 154)

Doctoral Degree(s)

- Mathematics - Doctor of Philosophy (p. 195)

Minors for the Department

- Mathematics - Undergraduate Minor (p. 765)

Professor, John Harding, Department Head

Professors Barany, Bezhanishvili, DeBlassie, Fouli, Giorgi, Harding, Lakey, Olberding, Smits, Wang; **Associate Professors** Ballyk, Contreras, Tian; **Assistant Professors** Bhattacharya, Oprisan, Shapirovskiy; **College Associate Professors** Villaverde; **College Assistant Professors** Archuleta, Cruz Quinones, Meek, O'Rourke; **College Instructors** Reece.

J. Harding Department Head, Ph.D. Ph.D. (McMaster) – applications of topological methods to ordered structures; M. Ballyk, Ph.D. (McMaster) – mathematical biology and ecology; E. Barany, Ph.D. (Ohio State) – mathematical physics; G. Bezhanishvili, Ph.D. (Tokyo Institute of Technology) – topology, algebra, and categories in logic; P. Bhattacharya, Ph.D. (Indiana) – algebraic topology; A. Contreras, Ph.D. (Indiana) – analysis and applied mathematics; D. DeBlassie, Ph.D. (MIT) – probability; L. Fouli, Ph.D. (Purdue) – commutative algebra; T. Giorgi, Ph.D. (Purdue) – applied mathematics; J. Lakey, (Maryland) – applied harmonic analysis; B. Olberding, Ph.D. (Wesleyan) – commutative algebra, valuation theory and module theory; A. Oprisan, Ph.D. (Texas–Arlington) – statistics, probability, and data science; I. Shapirovskiy, Ph.D. (IITP, Moscow, Russia) – foundations; R. Smits, Ph.D. (Purdue) – probability, harmonic analysis; J. Tian, Ph.D. (California–Riverside) – applied mathematics, mathematical biology, and biostatistics; T. Wang, Ph.D. (Windsor) – mathematical statistics.

Mathematics Courses

MATH 1130G. Survey of Mathematics

3 Credits (3)

This course will develop students' ability to work with and interpret numerical data, to apply logical and symbolic analysis to a variety of problems, and/or to model phenomena with mathematical or logical reasoning. Topics include financial mathematics used in everyday life situations, statistics, and optional topics from a wide array of authentic contexts. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.

Learning Outcomes

1. Construct and analyze graphs and/or data sets: Gather and organize information; Understand the purpose and use of various graphical representations such as tables, line graphs, tilings, networks, bar graphs, etc.; Interpret results through graphs, lists, tables, sequences, etc.; Draw conclusions from data or various graphical representations.
2. Use and solve various kinds of equations: Understand the purpose of and use appropriate formulas within a mathematical application; Solve equations within a mathematical application; Check answers to problems and determine the reasonableness of results.
3. Understand and write mathematical explanations using appropriate definitions and symbols: Translate mathematical information into symbolic form; Define mathematical concepts in the student's own words; Use basic mathematical skills to solve problems.
4. Demonstrate problem solving skills within the context of mathematical applications; Show an understanding of a mathematical application both orally and in writing; Choose an effective strategy to solve a problem; Gather and organize relevant information for a given application.

MATH 1134. Fundamentals of Elementary Mathematics I
3 Credits (3)

Numbers and the four operations of arithmetic. Understanding and comparing multiple representations of numbers and operations, in particular how these representations build from whole numbers to integers to fractions and decimals. Applying properties of numbers and operations in contextual situations. Reasoning, communicating, and problem solving with numbers and operations. Applications to ratio, and connections with algebra. Taught primarily through student activities and investigations. Restricted to: EDUC,EPAR,E ED,ECED majors. May be repeated up to 3 credits.

Prerequisite: C- or better in ENGL 1110G; adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.

Learning Outcomes

1. As future elementary teachers you will be teaching mathematics to children.
2. In order to teach a subject well you need not only to know the material that you will teach, but you need to know more than what you will teach, and know it well, in order to be able to answer questions, understand student reasoning, give alternate explanations when your students do not understand something, and be able to adjust to changes in the mathematical curriculum.
3. Furthermore, even if you hope to teach a given grade, you should be prepared to teach a variety of grades since what a person ends up teaching is often not what they planned to do.
4. We will explore ideas of arithmetic in a way to help you improve your mathematical ability, gain confidence in your ability, introduce to you different ideas and models, and to see a variety of mathematical activities that are appropriate for people of all ages.
5. Everything we study will be done with the aim of developing your ability to relate to the mathematics of elementary school and to help children develop mathematical understanding

MATH 1215. Intermediate Algebra
3 Credits (3)

A study of linear and quadratic functions, and an introduction to polynomial, absolute value, rational, radical, exponential, and logarithmic functions. A development of strategies for solving single-variable equations and contextual problems. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.

Learning Outcomes

1. Students will build on their knowledge of linear and quadratic functions and will begin to build an understanding of absolute value, polynomial, rational, power, radical, exponential and logarithmic functions in the following contexts: Demonstrate appropriate use of basic function language and notation; Convert between equivalent forms of algebraic expressions; Solve single-variable equations of the types listed above; Interpret and communicate algebraic solutions graphically and numerically; Demonstrate contextual problem-solving skills that include setting up and solving problems, and interpreting solutions in context; Apply appropriate problem solving methods from among algebraic, graphical, and numerical.

MATH 1217. General Supplemental Instruction I
1 Credit (2P)

Collaborative workshop for students enrolled in Intermediate Algebra. Graded: S/U Grading (S/U, Audit). Corequisite(s): MATH 1215

Learning Outcomes

1. Intermediate Algebra Workshop provides time for students to work on problems from Intermediate Algebra under the guidance of their Intermediate Algebra instructor

MATH 1220G. College Algebra
3 Credits (3)

The study of equations, functions and graphs, reviewing linear and quadratic functions, and concentrating on polynomial, rational, exponential and logarithmic functions. Emphasizes algebraic problem solving skills and graphical representation of functions. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.

Learning Outcomes

1. Use function notation; perform function arithmetic, including composition; find inverse functions.
2. Identify functions and their transformations given in algebraic, graphical, numerical, and verbal representations, and explain the connections between these representations.
3. Graph and interpret key feature of functions, e.g., intercepts, leading term, end behavior, asymptotes.
4. Solve equations algebraically to answer questions about graphs, and use graphs to estimate solutions to equations.
5. Solve contextual problems by identifying the appropriate type of function given the context and creating a formula based on the information given.
6. Communicate mathematical information using proper notation and verbal explanations.

MATH 1221. General Supplemental Instruction II
1 Credit (1+2P)

Collaborative workshop for students enrolled in College Algebra. Graded: S/U Grading (S/U, Audit).

Corequisite(s): MATH 1220G.

Learning Outcomes

1. College Algebra Workshop provides time for students to work on problems from College Algebra under the guidance of their College Algebra instructor

MATH 1250G. Trigonometry & Pre-Calculus**4 Credits (3+2P)**

Trigonometry & Pre-Calculus includes the study of functions in general with emphasis on the elementary functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions. Topics include rates of change, limits, systems of equations, conic sections, sequences and series, trigonometric equations and identities, complex number, vectors, and applications. May be repeated up to 4 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G.

Learning Outcomes

1. (Trigonometry) Students will be able to define and evaluate the trigonometric functions as functions of angle in both degree and radian measure using the definitions in terms of x , y , and r ; as the ratio of sides of a right triangle; using the unit circle; using reference angles, commonly used (0° , 30° , 45° , 60° , 90°) angles and using a calculator.
2. (Trigonometry) Students will be able to solve right triangles. They will be able to draw a sketch in an applied problem when necessary.
3. (Trigonometry) Students will be able to solve non-right triangles using the law of sines and the law of cosines.
4. (Trigonometry) Students will be able to prove trigonometric identities and apply addition and subtraction, double-angle, half-angle and power reduction formulas.
5. (Trigonometry) Students will be able to graph the six trigonometric functions, their transformations and their inverses.
6. (Trigonometry) Students will be able to use algebraic methods, including the use of identities and inverses, to solve trigonometric equations and demonstrate connections to graphical and numerical representations of the solutions.
7. (Trigonometry) Students will be able to add and subtract vectors in two dimensions. They will be able to use the dot product to project one vector onto another and to determine the angle between two vectors. They will be able to solve a variety of word problems using vectors.
8. (Trigonometry) Students will be able to work with polar coordinates; this includes graphing in polar coordinates and transforming an equation with polar coordinates into one with rectangular coordinates, and vice versa.
9. (Trigonometry) Students will be able to work with the trigonometric form of complex numbers, including using De Moivre's formula. 1
10. (Pre-Calculus) Functions: Reinforce recognizing a function from its graph and from its algebraic expression; Reinforce identification of a one-to-one function graphically and from its algebraic expression; Reinforce identification of inverse functions graphically and algebraically; Reinforce combining functions arithmetically and compositionally; Be able to calculate the average rate of change of a function using the difference quotient and depict it graphically; Be able to find a limiting value of a function and be able to identify and use the notation that describes this. 1
11. (Pre-Calculus) Graphing: Reinforce using key characteristics of functions to graph them; Be able to graph conic sections from their key characteristics such as foci, eccentricity and asymptotes; Be able to identify all functions mentioned from their graphs, describing their key aspects. 1
12. (Pre-Calculus) Solving: Exponential/Logarithmic equations using the rules of exponents and logarithms; Systems of linear equations by elimination; Non-linear systems algebraically and graphically. 1
13. (Pre-Calculus) Applications: Modeling with functions with an emphasis on exponential and logarithmic functions, growth and decay. 1
14. (Pre-Calculus) Sequences and series: Understand the concept and

MATH 1350G. Introduction to Statistics**3 Credits (3)**

This course discusses the fundamentals of descriptive and inferential statistics. Students will gain introductions to topics such as descriptive statistics, probability and basic probability models used in statistics, sampling and statistical inference, and techniques for the visual presentation of numerical data. These concepts will be illustrated by examples from a variety of fields.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.

Learning Outcomes

1. Explain the general concepts of statistics: Explain and evaluate statistics used in the real world (from a news article, research project, etc.); Use statistical vocabulary appropriately; Distinguish between descriptive and inferential statistics; Distinguish between qualitative and quantitative data; Distinguish between populations and samples, and parameters and statistics; Give examples of independent and dependent variables.
2. Presentation and description of data: Present data graphically using histograms, frequency curves and other statistical graphs; Interpret graphs of data, including histograms and shapes of distributions.
3. Summarize data using measures of central tendency and variation: Calculate and interpret the mean, median, and mode to describe data; Calculate and interpret range, variance, and standard deviation to describe data.
4. Present the concepts of probability: Interpret basic probabilities; Calculate probabilities using compound probability rules and the binomial distribution; Calculate probabilities using the standard normal distribution and relate them to areas under the curve; Determine if the binomial distribution can be approximated with the normal distribution; Describe the relationship between the sampling distribution and the population distribution; Use the central limit theorem to approximate the probability distribution and calculate probabilities.
5. Compute point and interval estimates: Determine the confidence interval for a parameter; Interpret the confidence level and margin of error; Determine whether a statistical technique is appropriate under stated conditions.
6. Perform hypothesis tests: Determine whether a statistical test is appropriate under stated conditions; Identify null and alternative hypothesis; Perform and interpret statistical tests (e.g. z-test, t-test, one-tailed and two-tailed, one-sample, two-sample) and determine whether data is statistically significant; State the conclusion of a hypothesis test; Interpret a p-value as compared to a significance level; Explain why a test can lead us to reject a null hypothesis, not accept one; Distinguish between Type I and Type II errors.
7. Analyze data using regression and correlation: Explain the difference between correlation and causation; Construct and interpret scatter plots; Calculate and interpret the linear correlation coefficient; Determine and use the equation of a least-squares regression line between two variables to make predictions; Interpret the meaning of the coefficient of determination.
8. Optional topics: Inter-quartile range, box-plots, stem-and-leaf plots; Combinations and permutations; The Poisson distribution; Statistical power; Chi-square; Analysis of variance.

MATH 1430G. Applications of Calculus I**3 Credits (2+2P)**

An algebraic and graphical study of derivatives and integrals, with an emphasis on applications to business, social science, economics and the sciences. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G or higher.

Learning Outcomes

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
4. Use the derivative to describe the rate of change and slope of a curve in general and at particular points. Compare and contrast average rates of change to instantaneous rates of change.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find the antiderivative and indefinite integral functions to include integration by substitution. Apply the Fundamental Theorem of Calculus in computing definite integrals of functions.
7. Approximate the area under the curve using Riemann sums.
8. Use the integral to determine the area under a curve and to find the accumulated value of a function in context.
9. Solve contextual problems by identifying the appropriate type of function given the context, creating a formula based on the information given, applying knowledge of algebra and calculus, and interpreting the results in context. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1435. Applications of Calculus I**3 Credits (3)**

Intuitive differential calculus with applications to engineering.

Prerequisite(s): C- or better in MATH 1250G.

Learning Outcomes

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Learn derivative rules for polynomial, exponential, logarithmic, trigonometric and inverse trigonometric functions.
4. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find partial derivatives and find maxima, minima in three dimensions.
7. Find the linear approximation of a function.
8. Find Maclaurin and Taylor series.
9. Find limits via L'Hospital's rule. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1440. Applications of Calculus II**3 Credits (3)**

Topics in this second course of Applications of Calculus include functions of several variables, techniques of integration, an introduction to basic differential equations, and other applications.

Prerequisites: C or better in MATH 1435 or in MATH 1521G, or in MATH 1521H.

Learning Outcomes

1. Find definite and indefinite integrals using integration by parts, integral tables, and numerical integration.
2. Analyze multivariable functions using partial derivatives and double integrals, and apply these techniques to applications such as optimization, least squares, and volumes.
3. Solve differential equations graphically, numerically, and algebraically using separation of variables, and apply differential equations in context.
4. Apply differentiation and integration to other areas, for example to Taylor polynomials and Taylor series, probability, trigonometric functions, etc.

MATH 1511G. Calculus and Analytic Geometry I**4 Credits (4)**

Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule. May be repeated up to 4 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1250G.

Learning Outcomes

1. The goals are to present the concepts of calculus, stressing techniques, applications, and problem solving, and emphasizing numerical aspects such as approximations and order of magnitude.
2. Overall, the goals are to illustrate the power of calculus as a tool for modeling situations arising in physics, science, engineering and other fields.
3. In fulfillment of these goals, this and later courses will stress topics such as polynomial approximation, setting up integrals, as well as the use of appropriate technology.

MATH 1521G. Calculus and Analytic Geometry II**4 Credits (4)**

Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series. May be repeated up to 4 credits.

Prerequisite: C- or better in MATH 1511G.

Learning Outcomes

1. Recognize the interplay between Riemann sums and definite integrals
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals
3. Demonstrate an understand of the relationship between the derivative and the definite integral
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's)
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions
6. Use integration to solve problems in geometry, physics, science, engineering and other fields
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals
8. Approximate functions using Taylor polynomials
9. Apply standard tests to determine convergence or divergence of sequences and series
10. Find a power series representation for a function and determine where it converges
11. Identify and evaluate first order differential equations

MATH 1521H. Calculus and Analytic Geometry II Honors**4 Credits (3+1P)**

A more advanced treatment of the material of MATH 1521G with additional topics. Consent of Instructor required. Restricted to Las Cruces campus only. May be repeated up to 4 credits.

Learning Outcomes

1. Recognize the interplay between Riemann sums and definite integrals.
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
3. Demonstrate an understand of the relationship between the derivative and the definite integral.
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions.
6. Use integration to solve problems in geometry, physics, science, engineering and other fields.
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
8. Approximate functions using Taylor polynomials.
9. Apply standard tests to determine convergence or divergence of sequences and series.
10. Find a power series representation for a function and determine where it converges.
11. Identify and evaluate first order differential equations.

MATH 1531. Introduction to Higher Mathematics**3 Credits (3)**

Logic; sets, relations, and functions; introduction to mathematical proofs.

Prerequisite(s): C- or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. The primary objective of this course is to serve as a bridge between the calculus courses you have taken, where the focus is on computations and solving problems, to more abstract mathematics courses.
2. In particular, we will discuss logical reasoning, definitions, proofs, and certain basic building blocks such as sets, functions, and relations.
3. By the end of the course, you should be able to understand and construct well-written proofs of basic mathematical arguments involving simple properties of the real numbers, integers, sets, functions, and relations using universal and existential quantifiers, absolute values and inequalities, modular arithmetic, and proof by induction.

MATH 1996. Topics in Mathematics**1-3 Credits**

Topics to be announced in the Schedule of Classes. Maximum of 3 credits per semester. Total credit not to exceed 6 credits. Community Colleges only.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

MATH 2134G. Fundamentals of Elementary Math II**3 Credits (3)**

Geometry and measurement. Multiple approaches to solving problems and understanding concepts in geometry. Analyzing and constructing two- and three-dimensional shapes. Measurable attributes, including angle, length, area, and volume. Understanding and applying units and unit conversions. Transformations, congruence, and symmetry. Scale factor and similarity. Coordinate geometry and connections with algebra. Reasoning and communicating about geometric concepts. Taught primarily through student activities and investigations. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 1134.

Learning Outcomes

1. The primary objectives are mathematical: to understand some of the basic concepts of geometry, and measurement with an appropriate level of rigor; to appreciate the historical, cultural and educational contributions and potential applications in real life situations; and to gain problem solving skills using these concepts.
2. The secondary goal is to appreciate the importance of this material in the elementary school curriculum.

MATH 2234. Fundamentals of Elementary Mathematics III**3 Credits (3)**

Probability, statistics, ratios, and proportional relationships. Experimental and theoretical probability. Collecting, analyzing, and displaying data, including measurement data. Multiple approaches to solving problems involving proportional relationships, with connections to number and operation, geometry and measurement, and algebra. Understanding data in professional contexts of teaching. Taught primarily through student activities and investigations. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 2134G.

Learning Outcomes

1. In order to teach a subject well you need not only to know the material that you will teach, but you need to know more than what you will teach, and know it well, in order to be able to answer questions, give alternate explanations when your students do not understand something, and be able to adjust to changes in the mathematical curriculum.
2. Furthermore, even if you hope to teach a certain grade, you should be prepared to teach anything between kindergarten and 8th grade.
3. You also need to be aware of where a student is coming from in order to make adjustments in their curriculum.
4. A strong elementary school teacher must understand where his/her students are headed in order to most effectively direct them there.
5. This is especially true in mathematics, where students continue to build on the concepts they learn each year.

MATH 2350G. Statistical Methods**3 Credits (3)**

Exploratory data analysis. Introduction to probability, random variables and probability distributions. Concepts of Central Limit Theorem and Sampling Distributions such as sample mean and sample proportion. Estimation and hypothesis testing single population parameter for means and proportions and difference of two population parameters for means and proportions. Analysis categorical data for goodness of fit. Fitting simple linear regression model and inference for regression parameters. Analysis of variance for several population means. Techniques in data analysis using statistical packages. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.

Learning Outcomes

1. Summarize Data through graphs and Descriptive statistics: Define qualitative and quantitative data; Provide examples of a population, a sample, independent and dependent variables, parameters and statistics; Construct and interpret histograms, stem plots, bar charts, and boxplot; Summarize distributions with numerical measures such as mean, median, standard deviation, percentiles, interquartile range.
2. Present the concepts of probability: Explain related to probability axioms (e.g. mutually exclusive events and independent events); Apply applications of probability rules; Apply Conditional probability and Bayes Rule.
3. Distinguish between discrete and continuous random variables: Calculate probabilities using Binomial and Poisson distributions; Calculate probabilities using the standard normal distribution by finding the area underneath the curve.
4. Explain the Central Limit Theorem: Introduce the concept of a sampling distribution; Discuss the distribution of the sample mean and sample proportion under repeated sampling; Generate and interpret a sampling distribution using repeated sampling; Determine if the Binomial and Poisson distribution can be approximated with the normal distribution.
5. Estimate a population parameter: Determine confidence interval for population mean, proportion, difference of means, and difference of proportions; Interpret the confidence interval and margin of error; Explain the dependence of margin of error on sample size and confidence level.
6. Perform hypothesis tests for population parameters (population mean, proportion, difference of means, and difference of proportions); Describe the logic and framework of the inference of hypothesis testing; Make a decision using a p-value and draw an appropriate conclusion; Distinguish between Type I and Type II errors; Explain power of the test.
7. Perform Hypothesis Tests for Categorical data: Determine and analyze Chi-square test for Independence; Determine and analyze Chi-square test for Goodness of fit.
8. Analyze data using regression and correlation: Construct scatterplots and analyze the scatter plots; Calculate the linear correlation coefficient and determine whether a linear relationship exists between two variables; Fit the least-squares regression line between two variables; Predict the response variable from the regression line; Apply statistical inference to regression parameters.
9. Perform analysis of variance: State hypotheses for the test of several population means; Construct the AVOVA Table; Explain the significance of multiple comparisons. 1
10. Demonstrate the appropriate use of technology (e.g., Excel, an appropriate graphing calculator or other software (Minitab, SAS)

MATH 2415. Introduction to Linear Algebra**3 Credits (3)**

Systems of equations, matrices, vector spaces and linear transformations. Applications to computer science.

Prerequisite(s): Grade of C- or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. Use row reduction and echelon forms of a matrix to solve linear systems of equations.
2. Use matrix operations, inverse matrices, and matrix factorizations to solve matrix equations.
3. Study the properties of vector spaces and subspaces (e.g., the null and column spaces of a matrix); linear transformations, isomorphisms and kernels; linear independence, bases, and dimension.
4. Apply appropriate matrix manipulations to perform a change of basis.
5. Understand determinants and their properties.
6. Find eigenvalues and eigenvectors and use them to diagonalize matrices.
7. Understand inner product spaces and apply them to real-world problems.

MATH 2530G. Calculus III**3 Credits (3)**

Continuation of Calculus II including multivariate and vector calculus, level curves and surfaces, partial derivatives, gradient, directional derivatives, tangent planes, optimization, multiple integrals in Cartesian, cylindrical and spherical coordinate systems. May be repeated up to 3 credits.

Prerequisite: Grade of C- or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. Use vector notation correctly.
2. Perform vector operations, including dot product, cross product, differentiation and integration, and demonstrate their geometric interpretations.
3. Perform operations on vector valued functions and functions of a parameter.
4. Identify and graph the equations of cylinders and quadratic surfaces in 3-dimensional space.
5. Determine the domain of continuity of a vector valued function and of a function of multiple variables.
6. Compute partial derivatives, generally and at a point, and sketch their graphical representation on a surface in space.
7. Recognize when the chain rule is needed when differentiating functions of multiple variables, parametric equations and vector valued functions, and be able to use the chain rule in these situations.
8. Compute curvature of a parameterized vector representation of a curve in 2- and 3-dimensional space and be able to explain its meaning.
9. Compute the unit tangent and unit normal vectors to a curve and be able to sketch them with the curve. 1
10. Computationally move among position vector, velocity vector, speed, and acceleration vectors; recognize and demonstrate their use as applied to motion in space. 1
11. Determine the equation of the tangent plane to a surface at a point. 1
12. Use the tangent plane to a surface to approximate values on the surface and estimate error in approximation using differentials 1
13. Compute directional derivatives and represent them graphically relative to the inherent surface. 1
14. Compute the gradient vector; represent it graphically relative to the inherent surface and use it to maximize or minimize rate of change of the function. 1
15. Locate local and global maxima and minima of a function. 1
16. Use Lagrange multipliers to maximize output with one or two constraints. 1
17. Compute arc length and be able to explain its derivation as a limit. 1
18. Calculate double and triple integrals independently and with their geometric representations as surfaces, areas and volumes. 1
19. Calculate iterated integrals in polar, cylindrical and spherical coordinate systems.

MATH 2992. Directed Study**1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of the instructor.

Learning Outcomes

1. Varies

MATH 300. Readings**1-3 Credits**

A selection of readings and reports in the mathematical sciences, the breadth and depth of which is deemed to fit the needs of the student. Graded S/U.

Prerequisite: consent of instructor.

MATH 313. Fundamentals of Algebra and Geometry I**3 Credits (3+1P)**

Covers algebra combined with geometry based on measurements of distance (metric geometry). Secondary mathematics education majors may take course as a math elective. MATH 313 does not substitute for other required math courses. Does not fulfill requirements for major in mathematics.

Prerequisites: MATH 1134 and MATH 2134G.

MATH 331. Introduction to Modern Algebra**3 Credits (3)**

Elements of abstract algebra, including groups, rings and fields.

Prerequisite: C or better in MATH 1531 and MATH 2415.

MATH 332. Introduction to Analysis**3 Credits (3)**

Development of the real numbers, a rigorous treatment of sequences, limits, continuity, differentiation, and integration. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 1531.

Learning Outcomes

1. Understand the Axiom of Completeness and be able to work with suprema and infima.
2. Know the basic definitions of sequences and be able to understand and construct rigorous epsilon-N proofs.
3. Understand the properties of convergent sequences and be able to construct related proofs.
4. Know the basic definitions of limits and be able to understand and construct epsilon-delta proofs.
5. Be familiar with the basic properties and topology of the reals.

MATH 333. Introduction to Geometry**3 Credits (3)**

Building on ideas from high school geometry, an introduction to the axiomatic method, transformation groups, and non-Euclidean geometry.

Prerequisite: C- or better in MATH 1531 and MATH 2415.

Learning Outcomes

1. Demonstrate the ability to make conjectures in geometry, refine conjectures, and prove or refute conjectures.
2. Understand how transformations of the plane can be used to define and apply the concepts of congruence and similarity in Euclidean geometry.
3. Solve problems in geometry using different approaches (axioms, coordinates, transformations), and explain how the different approaches are related.
4. Compare the definitions and theorems of Euclidean geometry with the corresponding definitions and theorems in non-Euclidean geometry.

MATH 377. Introduction to Numerical Methods**3 Credits (3)**

Basic numerical methods for interpolation, approximation, locating zeros of functions and integration; numerical linear algebra. Computer-oriented methods will be emphasized. Student must also have some programming experience in order to enroll.

Prerequisite: C- or better in one of MATH 2415, M E 228, or E E 200.

Learning Outcomes

1. Understand the limitations, advantages, and disadvantages of common numerical methods and how they are used to obtain approximate solutions.
2. Apply numerical methods to obtain approximate solutions to mathematical problems.
3. Analyze and evaluate the accuracy of common numerical methods.
4. Write efficient, well-documented code to implement numerical methods.

MATH 391. Vector Analysis**3 Credits (3)**

Calculus of vector valued functions, Green's and Stokes' theorems and applications.

Prerequisite: grade of C or better in MATH 2530G.

MATH 392. Introduction to Ordinary Differential Equations**3 Credits (3)**

Introduction to differential equations and dynamical systems with emphasis on modeling and applications. Basic analytic, qualitative and numerical methods. Equilibria and bifurcations. Linear systems with matrix methods, real and complex solutions.

Prerequisite: C or better in MATH 1521G or MATH 1521H or B or better in MATH 1440.

MATH 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of faculty member.

MATH 401. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be used to fulfill a course requirement for the mathematics major. Consent of Instructor required.

MATH 411V. Great Theorems in Mathematics**3 Credits (3)**

This course examines some significant mathematical achievements from antiquity to the modern era. Evolution of notions and methods in geometry, number theory, algebra, and calculus will be supplemented by cultural and biographical history, placing mathematics in a broad human context.

Prerequisite(s): Grade of C- or higher in MATH 1531, or grade of B or higher in any upper-division math course, or consent of instructor.

Learning Outcomes

1. At the end of this course, students will be able to: Describe the history of the development of some key mathematical concepts.
2. Describe the connections between mathematical ideas in different historical periods and places.
3. Recognize the role of abstraction and logic in the progress of mathematics.
4. Describe the contribution of mathematics to culture and science in different historical eras.
5. Determine if a mathematical conjecture is correct and provide rigorous written mathematical justification.
6. Provide sound, complete and clear mathematical arguments involving simple calculations, geometric constructions, and/or written mathematical proofs.
7. Communicate mathematical ideas, both written and orally.

MATH 450. Introduction to Topology**3 Credits (3)**

Topological spaces: general spaces and specific examples such as metric spaces, Hausdorff spaces and/or normed vector spaces; separation axioms; continuity, compactness, connectedness; related theorems. Crosslisted with: MATH 520.

Prerequisite(s): MATH 332.

MATH 451. Introduction to Differential Geometry**3 Credits (3)**

Applies calculus to curves and surfaces in three dimensional Euclidean space.

Prerequisite(s): C- or better in each of MATH 2415 and MATH 391, or consent of instructor.

MATH 452. Foundations of Geometry**3 Credits (3)**

Topics in projective, axiomatic Euclidean or non-Euclidean geometries. Restricted to: Main campus only.

Prerequisite(s): C or better in MATH 331 or MATH 332.

MATH 454. Logic and Set Theory**3 Credits (3)**

Propositional and first order logic; axioms, proofs, models. Semantic and syntactic consequence. Soundness, completeness, compactness, and Loewenheim –Skolem theorems. The Zermelo-Fraenkel axioms for set theory. Well orderings, ordinals, cardinals, the axiom of choice, and the von Neumann hierarchy. Crosslisted with: MATH 524.

Prerequisite(s): C- or better in MATH 331 or MATH 332, or consent of instructor.

MATH 455. Elementary Number Theory**3 Credits (3)**

Covers primes, congruences and related topics.

Prerequisite(s): grade of C or better in MATH 331 or consent of instructor.

MATH 456. Abstract Algebra I: Groups and Rings**3 Credits (3)**

Group theory, including cyclic groups, homomorphisms, cosets, quotient groups and Lagrange's theorem. Introduction to rings: ring homomorphisms, ideals, quotient rings, polynomial rings, and principal ideal domains. Crosslisted with: MATH 526.

Prerequisite(s): MATH 331 or consent of instructor.

MATH 459. Survey of Geometry**3 Credits (3)**

Basic concepts of Euclidean geometry, ruler and compass constructions. May include topics in non-Euclidean geometry. For non-math majors.

Restricted to: Main campus only.

Prerequisite(s): C or better in MATH 331 or MATH 332.

MATH 471. Complex Variables**3 Credits (3)**

A first course in complex function theory, with emphasis on applications.

Prerequisite(s): C- or better in MATH 391 or C- or better in both MATH 392 and MATH 2530G.

MATH 472. Fourier Series and Boundary Value Problems**3 Credits (3)**

Fourier series and methods of solution of the boundary value problems of applied mathematics.

Prerequisite(s): C- or better in MATH 392.

MATH 473. Calculus of Variations and Optimal Control**3 Credits (3)**

Euler's equations, conditions for extrema, direct methods, dynamic programming, and the Pontryagin maximal principle.

Prerequisite(s): C- or better in MATH 392.

MATH 480. Applied Linear Algebra**3 Credits (3)**

An application-driven course, whose topics may include the four fundamental subspaces, inner products, orthogonality, diagonalization, and complex matrices. Applications may include factorization, least squares, data compression, singular value decomposition, and discrete Fourier transform.

Prerequisite(s): C- or better in one of MATH 2415, E E 200, or M E 228.

Learning Outcomes

1. Understand higher-level linear algebra concepts for which matrix linear algebra is the basic tool.
2. Understand how to apply higher-level linear algebra concepts to problems that arise in real-world applications.

MATH 481. Advanced Linear Algebra**3 Credits (3)**

Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics.

Prerequisite(s): grade of C or better in MATH 331.

MATH 491. Introduction to Real Analysis I**3 Credits (3)**

Rigorous discussion of the topics introduced in calculus. Sequences, series, limits, continuity, differentiation.

Prerequisite(s): grade of C or better in MATH 332 or consent of instructor.

MATH 492. Introduction to Real Analysis II**3 Credits (3)**

Continuation of MATH 491. Integration, metric spaces and selected topics.

Prerequisite(s): C- or better in MATH 491 or consent of instructor.

MATH 498. Directed Reading**1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

MATH 501. Introduction to Differential Geometry**3 Credits (3)**

Same as MATH 451 with additional work for graduate students.

MATH 502. Foundations of Geometry**3 Credits (3)**

Same as MATH 452 with additional assignments for graduate students.

MATH 505. Elementary Number Theory**3 Credits (3)**

Same as MATH 455 with additional assignments for graduate students.

MATH 511. Fundamentals of Elementary Mathematics I**3 Credits (3+1P)**

Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 1134 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 512. Fundamentals of Elementary Mathematics II**3 Credits (3+1P)**

Real numbers, geometry, and statistics, incorporating calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 2134G undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 513. Fundamentals of Algebra and Geometry I**3 Credits (3+1P)**

Algebra and metric geometry, incorporating appropriate calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 313 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 517. Complex Variables**3 Credits (3)**

Same as MATH 471 with additional work for graduate students.

MATH 518. Fourier Series and Boundary Value Problems**3 Credits (3)**

Same as MATH 472 with additional work for graduate students.

MATH 519. Calculus of Variations and Optimal Control**3 Credits (3)**

Same as MATH 473 with additional work for graduate students.

MATH 520. Introduction to Topology**3 Credits (3)**

Same as MATH 450 with additional work for graduate students. Crosslisted with: MATH 450.

MATH 524. Logic and Set Theory**3 Credits (3)**

Same as MATH 454 with additional assignments for graduate students. Crosslisted with: MATH 454.

Prerequisite(s): consent of instructor.**MATH 525. Advanced Linear Algebra****3 Credits (3)**

Same as MATH 481 with additional work for graduate students. May be repeated up to 3 credits.

MATH 526. Abstract Algebra I: Groups and Rings**3 Credits (3)**

Same as MATH 456 with additional work for graduate students. Crosslisted with: MATH 456.

Prerequisite(s): MATH 525 or consent of instructor.**MATH 527. Introduction to Real Analysis I****3 Credits (3)**

Same as MATH 491 with additional work for graduate students.

MATH 528. Introduction to Real Analysis II**3 Credits (3)**

Same as MATH 492 with additional work for graduate students.

MATH 529. Complex Analysis**3 Credits (3)**

Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations.

Prerequisite: MATH 332.**MATH 530. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.

MATH 540. Directed Reading**1-6 Credits**

May be repeated for a maximum of 6 credits. Consent of instructor required. Graded: S/U.

MATH 541. Topology I**3 Credits (3)**

Connectedness and compactness of topological spaces, introduction to the quotient topology, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem

Prerequisite(s): MATH 525 and MATH 528, or consent of instructor.**MATH 542. Topology II****3 Credits (3)**

Covering spaces and their classification, singular homology, degree theory, Brouwer's fixed point theorem, CW-complexes and cellular homology, and other applications.

Prerequisite(s): MATH 541 or consent of instructor.**MATH 551. Mathematical Structures in Logic****3 Credits (3)**

Lattices, distributive lattices, Boolean algebras, Heyting algebras. Lindenbaum-Tarski algebras of classical and intuitionistic logics. Representation theorems. Modal logics and their algebraic counterparts. Kripke semantics. Goedel translation.

Prerequisite(s): MATH 524.**MATH 552. Universal Algebra and Model Theory****3 Credits (3)**

Universal algebra, homomorphisms, subalgebras, products, congruences. Varieties and class operators. Free algebras and Birkhoff's theorem. Ultraproducts and Los's theorem. Congruence distributive varieties and Jonsson's theorem. Universal classes and quasi-varieties.

Prerequisite(s): MATH 524.**MATH 562. History and Theories of Mathematics Education****3 Credits (3)**

A study of the history of the mathematics taught in American schools, including an examination of authentic original textbooks and the changes in their content and the approach to the subject over time, together with writings of people who have influenced the development and changes of mathematics education. Theories of learning mathematics, and current issues in mathematics education.

Prerequisite(s): Restricted to graduate students.

MATH 563. Algebra with Connections**3 Credits (3)**

Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 564. From Number to Algebra**3 Credits (3)**

The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 566. Data Analysis with Applications**3 Credits (3)**

Statistical concepts and terminology in professional uses of data by teachers, such as standardized test score reports and educational research; visual displays of data; measures of variation and central tendency; consideration of how K-12 topics in Data Analysis are developed from one grade level to the next. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 567. From Measurement to Geometry**3 Credits (3)**

The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 568. Using Number Throughout the Curriculum**3 Credits (3)**

Understand number concepts more deeply by seeing many examples of those concepts applied in other content strands. Develop mathematical knowledge and understanding to build a repertoire of ways for students to practice and review basic number skills and concepts as part of later, more advanced courses. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 569. Geometry with Connections**3 Credits (3)**

Connections between Geometry and other K-12 curriculum strands, especially Algebra and Probability / Data Analysis. Address key attributes of geometric concepts by considering their connections within and across grade levels. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 571. Partial Differential Equations I**3 Credits (3)**

The basic equations of mathematical physics. Laplace, Heat and Wave Equations. The method of characteristics, introduction to conservation laws, special solutions.

Prerequisite(s): MATH 518 and MATH 528 or consent of instructor.

MATH 572. Partial Differential Equations II**3 Credits (3)**

Sobolev spaces theory: basic definitions and properties, embedding theorems, weak solutions of boundary value problems and variational methods for partial differential equations.

Prerequisite(s): MATH 593 or consent of instructor.

MATH 581. Abstract Algebra II: Fields, Rings and Modules**3 Credits (3)**

Topics covered include field extensions; algebraic closure; polynomials rings; irreducibility criteria; Noetherian rings; algebraic sets; Nullstellensatz; modules; applications to linear algebra.

Prerequisite(s): MATH 526 or consent of instructor.

MATH 582. Module Theory and Homological Algebra**3 Credits (3)**

Introductory concepts of homological algebra, including projective, injective and flat modules; projective and injective resolutions; exactness of functors; homology of chain complexes; derived functors.

Prerequisite(s): MATH 581 or consent of instructor.

MATH 583. Introduction to Commutative Algebra and Algebraic Geometry**3 Credits (3)**

Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases.

Prerequisite(s): MATH 581 or consent of instructor.

MATH 593. Measure and Integration**3 Credits (3)**

Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.

Prerequisite: MATH 528 or consent of instructor.

MATH 594. Real Analysis**3 Credits (3)**

Differentiation, L_p spaces, Banach spaces, measure and topology, other selected topics.

Prerequisite: MATH 593.

MATH 595. Introduction to Functional Analysis**3 Credits (3)**

Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem.

Prerequisite(s): MATH 594, or consent of instructor.

MATH 599. Master's Thesis**1-15 Credits**

Thesis.

MATH 600. Doctoral Research**1-15 Credits**

Research.

MATH 698. Selected Topics**1-15 Credits**

Selected topics.

MATH 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

Statistics Courses

STAT 371. Statistics for Engineers and Scientists I 3 Credits (3)

Modern probability and statistics with applications to the engineering sciences.

Prerequisite(s): C- or better in MATH 1521G or MATH 1521H.

STAT 400. Undergraduate Research 1-3 Credits

Arrangements must be made with supervising professor before registration. May be repeated for a maximum of 6 credits.

STAT 470. Probability: Theory and Applications 3 Credits (3)

Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.

Prerequisite(s): C- or better in MATH 2530G and C- or better in at least one-300 level Math course.

STAT 480. Statistics: Theory and Applications 3 Credits (3)

Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.

Prerequisite(s): C- or better in STAT 470.

STAT 515. Probability: Theory and Applications 3 Credits (3)

Same as STAT 470 with additional work for graduate students.

STAT 525. Statistics: Theory and Applications 3 Credits (3)

Same as STAT 480 with additional work for graduate students.

STAT 535. Elementary Stochastic Processes 3 Credits (3)

Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.

Prerequisite: STAT 515 or consent of instructor.

STAT 540. Directed Reading 1-6 Credits

May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of instructor and graduate committee.

STAT 562. Foundations of Probability 3 Credits (3)

Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.

Prerequisite: MATH 593.

STAT 563. Advanced Topics in Stochastic Processes 3 Credits (3)

Markov processes, martingales, Brownian motion, the Ito calculus, stochastic differential equations.

Prerequisite: STAT 562.

Learning Outcomes

1. Understand the notion of a stochastic process.
2. Learn the basic properties of special stochastic processes: Markov processes and martingales.
3. Study and assimilate the fine properties of a particular instance of the stochastic process known as Brownian motion that is both a Markov process and a martingale.
4. Understand the application of Brownian motion known the Ito calculus and become fluent in its use.
5. Apply the Ito calculus to study stochastic differential equations.

STAT 571. Continuous Multivariate Analysis 3 Credits (3)

Theory and applications of the multivariate normal distribution. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): STAT 525, or consent of instructor.

STAT 572. Linear Models 3 Credits (3)

Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.

Prerequisite(s): STAT 571.

STAT 581. Advanced Theory of Statistics I 3 Credits (3)

Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.

Prerequisite: STAT 525 or consent of instructor.

STAT 582. Advanced Theory of Statistics II 3 Credits (3)

Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.

Prerequisite: STAT 581 or consent of instructor.

STAT 598. Special Research Problems 1-3 Credits

Individual investigations or consulting programs. Maximum of 3 credits.

Phone: (575) 646-3901

Website: <https://math.nmsu.edu/>

Mathematics (Actuarial Science and Insurance) - Bachelor of Science

The concentration in Actuarial Science and Insurance draws on courses from mathematics and business to prepare students for a mathematical career in insurance. The coursework in this emphasis focuses on the analysis of risk and its applications to insurance finance. Students fulfilling the requirements for the Actuarial Science and Insurance Concentration earn a minor in Risk Management and Insurance.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World

requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) ¹	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area III: Laboratory Science Course (4 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
Viewing a Wider World ³		3
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 331	Introduction to Modern Algebra	3
or MATH 332	Introduction to Analysis	
STAT 371	Statistics for Engineers and Scientists I	3
STAT 470	Probability: Theory and Applications	3
STAT 480	Statistics: Theory and Applications	3
<i>Departmental Electives</i>		
Select at least an additional 9 credits of approved upper-division courses prefixed MATH or STAT (6 credits must be 400-level), excluding the following:		9
MATH 300	Readings	
MATH 313	Fundamentals of Algebra and Geometry I	
MATH 400	Undergraduate Research	
MATH 459	Survey of Geometry	
MATH 498	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁴		
ACCT 2110	Principles of Accounting I	3

ACCT 2120	Principles of Accounting II	3
BLAW 316	Legal Environment of Business	3
or BLAW 385V	Employment and Consumer Law	
C S 172	Computer Science I	4
BFIN 322	Principles of Insurance	3
BFIN 341	Financial Analysis and Markets	3
Select one option from the following three:		9
OPTION 1		
BFIN 323	Life/Health/Employee Benefits	
Select two courses from the following:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
or BFIN 421	Personal Financial Planning for Professionals	
BFIN 324	Property and Liability Insurance	
BFIN 391	Finance Internship and Cooperative Education I	
OPTION 2		
BFIN 324	Property and Liability Insurance	
Select two courses from the following:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
or BFIN 421	Personal Financial Planning for Professionals	
BFIN 323	Life/Health/Employee Benefits	
BFIN 391	Finance Internship and Cooperative Education I	
OPTION 3		
BFIN 326	Business Risk Management	
Select two courses from the following:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
or BFIN 421	Personal Financial Planning for Professionals	
BFIN 323	Life/Health/Employee Benefits	
BFIN 324	Property and Liability Insurance	
BFIN 391	Finance Internship and Cooperative Education I	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 ⁵		25
6 credits must be upper division		
Total Credits		120

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses. Note one of the VWW requirements will be satisfied using the 9 hour rule with the FIN courses that are required for the degree.

⁴ A grade of C- or better must be earned.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Mathematics with a Concentration in Actuarial Science and Insurance, there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1511G	Calculus and Analytic Geometry I (C- or better) ¹	4
Area III: Laboratory Science Course ²		4
C S 172	Computer Science I	4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
MATH 1521G	Calculus and Analytic Geometry II (C- or better)	4
Area V: Humanities Course ²		3
ECON 2110G	Macroeconomic Principles	3
Credits		32
Second Year		
ACCT 2110	Principles of Accounting I	3
MATH 1531	Introduction to Higher Mathematics (C- or better)	3
MATH 2530G	Calculus III (C- or better)	3
ECON 2120G	Principles of Microeconomics (C- or better, and will count towards Area IV, Gen.Ed))	3
BFIN 322	Principles of Insurance (C- or better)	3
Area VI: Creative and Fine Arts Course ²		3
MATH 2415	Introduction to Linear Algebra (C- or better)	3
STAT 371	Statistics for Engineers and Scientists I (C- or better)	3
ACCT 2120	Principles of Accounting II	3
BFIN 341	Financial Analysis and Markets	3
Credits		30
Third Year		
VWW - Viewing a Wider World ³		3

MATH 331 or MATH 332	Introduction to Modern Algebra (C- or better, Fall Only) ⁴ or Introduction to Analysis	3
OPTION 1,2 or 3 Course (C- or better) ⁵		6
Elective Course(s) ⁶		12
MATH/STAT Elective Course: 300-level or higher (C- or better) ^{7,8}		3
MATH/STAT Elective Course: 400-level (C- or better) ⁸		3
Credits		30
Fourth Year		
MATH/STAT Elective Course: 400-level (C- or better) ⁸		3
Option 1,2 or 3 Course (C- or better) ⁵		3
STAT 470	Probability: Theory and Applications (C- or better)	3
BLAW 316 or BLAW 385V	Legal Environment of Business (C- or better in either) or Employment and Consumer Law	3
Elective Course(s) ⁶		7-9
STAT 480	Statistics: Theory and Applications (C- or better)	3
Elective Course - Upper Division ⁶		6
Credits		28-30
Total Credits		120-122

¹ Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section for a full list of courses. Please note that the second VWW requirement will be satisfied by the 9 hour rule using the FIN courses that are required for the degree.

⁴ MATH 331 Introduction to Modern Algebra is only offered in the Fall semesters, however MATH 332 Introduction to Analysis is taught in the Spring and may be used as a substitute.

⁵ Do not mix options; pick one throughout.

OPTION 1: BFIN 323 Life/Health/Employee Benefits; two courses from (BFIN 303V Personal Financial Planning and Investing in a Global Economy OR BFIN 421 Personal Financial Planning for Professionals); BFIN 324 Property and Liability Insurance; BFIN 391 Finance Internship and Cooperative Education I.

OPTION 2: BFIN 324 Property and Liability Insurance; two courses from (BFIN 303V Personal Financial Planning and Investing in a Global Economy OR BFIN 421 Personal Financial Planning for Professionals); BFIN 323 Life/Health/Employee Benefits; BFIN 391 Finance Internship and Cooperative Education I.

OPTION 3: BFIN 326 Business Risk Management; two courses from (BFIN 303V Personal Financial Planning and Investing in a Global Economy OR BFIN 421 Personal Financial Planning for Professionals); BFIN 323 Life/Health/Employee Benefits; BFIN 324 Property and Liability Insurance; BFIN 391 Finance Internship and Cooperative Education I.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁷ MATH/STAT 300-level courses that cannot be taken to fulfill this requirement: MATH 300 Readings and MATH 313 Fundamentals of Algebra and Geometry I.

⁸ MATH/STAT 400-level courses that cannot be taken to fulfill this requirement: MATH 400 Undergraduate Research, MATH 459 Survey of Geometry, MATH 498 Directed Reading, STAT 400 Undergraduate Research.

Mathematics (Probability and Statistics) - Bachelor of Science

The concentration in Probability and Statistics provides students with a strong background in mathematical, probabilistic, and statistical analysis. Students also develop skills in the analysis of problems that arise in science, engineering, and other areas. The program provides a path to graduate studies or a career in industry.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) ¹	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
Area III: Laboratory Sciences Course (4 credits) ²		
Area IV: Social/Behavioral Sciences Course (3 credits) ²		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 credits or 3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
Viewing a Wider World ³		6
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3

MATH 332	Introduction to Analysis	3
MATH 377	Introduction to Numerical Methods	3
STAT 371	Statistics for Engineers and Scientists I	3
STAT 470	Probability: Theory and Applications	3
STAT 480	Statistics: Theory and Applications	3

Departmental Electives

Select at least 9 additional upper-division credits of approved courses prefixed MATH or STAT (at least 3 credits must be 400-level), excluding the following:

MATH 300	Readings
MATH 313	Fundamentals of Algebra and Geometry I
MATH 400	Undergraduate Research
MATH 459	Survey of Geometry
MATH 498	Directed Reading
STAT 400	Undergraduate Research

Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁴

Select one course from the following: 3

C S 153	Python Programming I
C S 158	R Programming I

Additional Requirements

Select one option from the following: 6

OPTION 1	
A ST 465	Statistical Analysis I
A ST 466	Statistical Analysis II

OPTION 2	
I E 311	Engineering Data Analysis
Select one course from the following:	
I E 365	Quality Control
I E 460	Evaluation of Engineering Data
I E 466	Reliability

Second Language Requirement: (not required)

Electives, to bring the total credits to 120 ⁵ **38**
12 credits must be upper division

Total Credits 120-121

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ A grade of C- or better must be earned.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor. Students should also consult their advisor about choosing the courses A ST 503 SAS Basics and A ST 505 Statistical Inference I as electives.

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in Statistics there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		Credits
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
Area III: Laboratory Science Course ²		4
Choose one from the following:		3
C S 153	Python Programming I	
C S 158	R Programming I	
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area VI: Creative and Fine Arts Course ²		3
MATH 1521G	Calculus and Analytic Geometry II	4
Area V: Humanities Course ²		3
Elective Course ³		3
Credits		31

Second Year		Credits
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Elective Course(s) ³		9
Area IV: Social/Behavioral Sciences Course ²		3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course ²		3-4
STAT 371	Statistics for Engineers and Scientists I	3
MATH 377	Introduction to Numerical Methods	3
Credits		30-31

Third Year		Credits
MATH 1531	Introduction to Higher Mathematics	3
STAT 470	Probability: Theory and Applications	3
Elective Course(s) ³		9
Elective Course - Upper Division ³		6
STAT 480	Statistics: Theory and Applications	3
MATH 332	Introduction to Analysis	3
VWW - Viewing a Wider World ⁵		3
Credits		30

Fourth Year		Credits
MATH/STAT Elective Course: 400-level ⁶		3
OPTION Course		6
VWW - Viewing a Wider World ⁵		3
Elective Course - Upper Division ³		6
MATH/STAT Elective Course: 300- level or higher (C- or better) ^{4,6}		6
Elective Course(s) ^{3,6}		5
Credits		29
Total Credits		120-121

¹ Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ MATH/STAT 300-level or higher courses that cannot be taken to fulfill this req MATH 400 Undergraduate Research, MATH 459 Survey of Geometry and STAT 400 Undergraduate Research.

⁵ See the Viewing a Wider World (p. 224) section for a full list of courses.

⁶ MATH/STAT 400-level courses that cannot be taken to fulfill this requirement: MATH 400 Undergraduate Research, MATH 459 Survey of Geometry, MATH 498 Directed Reading, STAT 400 Undergraduate Research.

Applied Mathematics - Supplemental Major

The program consists of 24 credits in the designated list of courses. To earn a supplementary major in applied mathematics a student must earn 15 credits from Categories I.A and I.B of which at least 9 credits must be from Category I.B. A student must also earn 9 credits from the Category II list of related disciplines. The courses in Category II may be taken from any combination of areas. A student may not earn a bachelor's degree in mathematics and also a supplementary major in applied mathematics.

Prefix	Title	Credits
Requirements		
<i>Category I.A.</i>		
Select two from the following:		6
MATH 377	Introduction to Numerical Methods	
MATH 391	Vector Analysis	
MATH 392	Introduction to Ordinary Differential Equations	
STAT 371	Statistics for Engineers and Scientists I	
<i>Category I.B.</i>		
Select three from the following:		9
MATH 331	Introduction to Modern Algebra	
MATH 332	Introduction to Analysis	
MATH 451	Introduction to Differential Geometry	
MATH 454	Logic and Set Theory	
MATH 450	Introduction to Topology	
MATH 471	Complex Variables	

MATH 472	Fourier Series and Boundary Value Problems
MATH 473	Calculus of Variations and Optimal Control
MATH 480	Applied Linear Algebra
STAT 470	Probability: Theory and Applications
STAT 480	Statistics: Theory and Applications

Category II

Select 9 credits from the following Related disciplines: 9

C E 315	Structural Analysis
C E 331	Fluid Mechanics and Hydraulics
C E 356	Fundamentals of Environmental Engineering
C E 382	Hydraulic and Hydrologic Engineering
C S 372	Data Structures and Algorithms
C S 476	Computer Graphics I
C S 486	Bioinformatics
C S 491	Parallel Programming
CHME 305	Transport Operations I: Fluid Flow
CHME 306	Transport Operations II: Heat and Mass Transfer
CHME 412	Process Dynamics and Control
CHME 441	Chemical Kinetics and Reactor Engineering
CHEM 433	Physical Chemistry I
CHEM 434	Physical Chemistry II
CHEM 456	Inorganic Structure and Bonding
ECON 405	Introductory Econometrics
ECON 457	Mathematical Economics
ECON 498	Independent Study (with approval)
E E 395	Introduction to Digital Signal Processing
E E 473	Introduction to Optics
E E 475	Control Systems Synthesis
E E 476	Computer Control Systems
E E 496	Introduction to Communication Systems
E E 497	Digital Communication Systems I
BFIN 355	Investments
BFIN 385	Analysis of Financial Markets and Institutions
BFIN 406	Theory of Financial Decisions
BFIN 435	Investment Analysis
I E 365	Quality Control
I E 413	Engineering Operations Research I
I E 423	Engineering Operations Research II
I E 460	Evaluation of Engineering Data
I E 466	Reliability
M E 332	Vibrations
M E 333	Intermediate Dynamics
M E 338	Fluid Mechanics
M E 341	Heat Transfer
PHYS 395	Intermediate Mathematical Methods of Physics
PHYS 451	Intermediate Mechanics I
PHYS 454	Intermediate Modern Physics I
PHYS 455	Intermediate Modern Physics II
PHYS 461	Intermediate Electricity and Magnetism I
PHYS 462	Intermediate Electricity and Magnetism II
PHYS 476	Computational Physics
PHYS 480	Thermodynamics
PHYS 485	Independent Study
PHYS 495	Mathematical Methods of Physics I
SUR 351	Spatial Data Adjustment I

SUR 451	Spatial Data Adjustment II
SUR 461	GNSS Positioning
C S 510	Automata, Languages, Computability ¹
C S 570	Analysis of Algorithms ¹

Total Credits 24

¹ Student must be eligible to take 500-level courses.

Mathematics - Undergraduate Minor

A student must pass 18 or more credit hours in MATH and STAT courses, with at least 9 of the credits in upper division courses completed at NMSU and three of those 9 credits in courses numbered above 400.

Prefix	Title	Credits
Requirements		
Select 18 credits or more in MATH and STAT courses, with at least 9 of the credits in upper division courses and three of those 9 credits in courses numbered above 400: ¹		18

The following courses are excluded from the minor:

Courses numbered below MATH 1350G	
MATH 2134G	Fundamentals of Elementary Math II
MATH 2234	Fundamentals of Elementary Mathematics III
MATH 2992	Directed Study
MATH 300	Readings
MATH 313	Fundamentals of Algebra and Geometry I
MATH 400	Undergraduate Research
MATH 459	Survey of Geometry
MATH 498	Directed Reading
STAT 400	Undergraduate Research
At most one can be selected from the following:	
MATH 1350G	Introduction to Statistics
MATH 2350G	Statistical Methods
STAT 371	Statistics for Engineers and Scientists I

Total Credits 18

¹ MATH 401 Special Topics must be approved by the department for credit toward the minor. Any course taught outside the Department of Mathematical Sciences but cross-listed with a MATH or STAT course, must also be approved by the department for credit toward the minor. A student may not earn a bachelor's degree in mathematics or a supplementary major in applied mathematics and also earn a minor in mathematics.

Military Science

Undergraduate Program Information

The Military Science program leads to a commission as an officer in the Army Reserve, National Guard or Active Duty Army. The program consists of four parts:

1. the student's academic major,
2. nondepartmental courses of value to the military service,
3. courses in military science and
4. a six-week Leader Development and Assessment course.

The department offers a four-year program divided into two parts: the basic course (two years) and the advanced course (two years). Selected

students may qualify for the two-year program with prior military service or successful completion of a six-week summer Leaders' Training Course. Financial assistance and scholarships are available for qualified individuals. Students should contact the Department of Military Science to obtain additional information.

Requirements

Courses should be taken in sequence, normally one per semester. The student's Military Science advisor will recommend course sequence. Military Science students must sign up for and attend courses plus laboratories. Departmental requirements may not be taken S/U.

Prefix	Title	Credits
Basic Course Freshman		
M SC 110	Introduction to Military Science	2
M SC 111	Introduction to Leadership	2
Basic Course Sophomore		
M SC 210	Self/Team Development	3
M SC 211	Leadership in Action and Team Building	3
M SC 225	Directed Studies	1-3
Advanced Course Junior		
M SC 310	Leading Small Organizations I	3
M SC 310 L	Leading Small Organizations I Lab	1
M SC 320	Leading Small Organizations II	3
M SC 320 L	Leading Small Organizations II Lab	1
M SC 325	Advanced Directed Studies	1-3
M SC 350	Cadet Summer Training Advanced Course	3
Advanced Course Senior		
M SC 401	Leadership Challenges and Goal Setting	3
M SC 401 L	Leadership Challenges and Goal Setting Lab	1
M SC 402	Transition to Lieutenant	3
M SC 402 L	Transition to Lieutenant Lab	1
M SC 425	Practicum	1-4
Nondepartmental Requirements		
Select one course in Military History to meet Professional Military Education requirements. ¹		3
Total Credits		35-42

¹ See your Military Science advisor for specific courses.

Minors for the Department

- Military Science - Undergraduate Minor (p. 768)

LTC Adam D. Buchanan, Department Head

Senior Military Science Instructor: MSG Brandon Knobloch; **Assistant Professor of Military Science:** CPT Jay Kubler; **Military Science Instructors:** MSG Emerald Galindez, SFC Jesus Diaz; **National Guard Liaisons:** CPT Victoria Hilton, 1LT Orenday; **Logistics Technician:** Mr. Tony Scott; **Human Resources Assistant:** Mr. Julian Ramos; **Event Planner:** Ms. Patti Alarcon

Military Science Courses

M SC 110. Introduction to Military Science

2 Credits (2+1P)

Introduction to the Army, the Profession of Arms, and critical thinking. Students will examine the Army Profession and what it means to be a professional in the U.S. Army. The overall focus is on developing basic knowledge and comprehension of the Army Leadership Requirements Model while gaining a complete understanding of the Reserve Officers' Training Corps (ROTC) program, its purpose in the Army, and its advantages for the student. Cadets also learn how resiliency and fitness supports their development as an Army leader. Includes a weekly lab facilitated by MSL III Cadets and supervised by Cadre. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

M SC 111. Introduction to Leadership

2 Credits (2+1P)

Introduction to the personal challenges and competencies that are critical for effective leadership. Students learn how the personal development of life skills such as critical thinking, time management, goal setting, and communication contribute to effective leadership. Students learn the basics of the communications process and the importance for leaders to develop the essential skills to effectively communicate in the Army. Students will begin learning the basics of squad level tactics that will be reinforced during a weekly lab facilitated by MSL III Cadets and supervised by Cadre. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

M SC 210. Self/Team Development

3 Credits (3+1P)

A focus on leadership and decision making. The course adds depth to the student's understanding of the Adaptability Army Learning Area. Outcomes are demonstrated through Critical and Creative Thinking and the ability to apply Troop Leading Procedures (TLP) to apply Innovative Solutions to Problems. The Army Profession is also stressed through leadership forums and a leadership self-assessment. Students are then required to apply their knowledge outside the classroom in a hands-on performance-oriented environment during a weekly lab facilitated by MSL III Cadets and supervised by Cadre and three physical fitness sessions per week. Restricted to Las Cruces campus only.

M SC 211. Leadership in Action and Team Building

3 Credits (3+1P)

A focus on Army doctrine and team development. The course begins the journey to understand and demonstrate competencies as they relate to Army doctrine. Army Values, Teamwork, and Warrior Ethos and their relationship to the Law of Land Warfare and philosophy of military service are also stressed. The ability to lead and follow is also covered through Team Building exercises at squad level. Students are then required to apply their knowledge outside the classroom in a hands-on performance-oriented environment during a weekly lab facilitated by MSL III Cadets and supervised by cadre and three physical fitness sessions per week. Restricted to Las Cruces campus only.

M SC 225. Directed Studies

1-3 Credits

Individual directed studies under supervision of the Professor of Military Science. May be repeated up to 12 credits. Restricted to Las Cruces campus only.

Prerequisite(s): GPA 2.5 or better.

M SC 310. Leading Small Organizations I**3 Credits (3)**

Part of the Senior ROTC Advanced Course, this course provides a Focus on training management and the warfighting functions. It is an academically challenging course where Cadets study, practice, and apply the fundamentals of Training Management and how the Army operates through the Warfighting functions. At the conclusion of this course, Cadets will be capable of planning, preparing, and executing training for a squad conducting small unit tactics. Includes one lab meeting per week using peer facilitation overseen by MSL IVs, supervised by ROTC Cadre and three physical fitness sessions per week. Students must meet Basic Course of Military Science requirements to enroll in this course.

Corequisite(s): M SC 310 L.

M SC 310 L. Leading Small Organizations I Lab**1 Credit (1P)**

Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 310.

Corequisite(s): M SC 310.

M SC 320. Leading Small Organizations II**3 Credits (3)**

Part of the Senior ROTC Advanced Course, this course provides a focus on applied leadership in small unit operations. It is an academically challenging course where Cadets study, practice, and apply the fundamentals of direct level leadership and small unit tactics at the platoon level. At the conclusion of this course, Cadets will be capable of planning, coordinating, navigating, motivating and leading a platoon in the execution of a mission. Includes one lab meeting per week using peer facilitation overseen by MSL IVs, supervised by ROTC Cadre and three physical fitness sessions per week. Successful completion of this course is a requirement to Cadet Summer Training Advance Camp during the summer, at Fort Knox, KY. Prerequisite(s): M SC 310

Corequisite(s): M SC 320 L.

M SC 320 L. Leading Small Organizations II Lab**1 Credit (1P)**

Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open to students taking M SC 320.

Corequisite(s): M SC 320.

M SC 325. Advanced Directed Studies**1-3 Credits**

Directed individual study of advanced subjects under the guidance of the Professor of Military Science. May be repeated up to 12 credits.

Prerequisite(s): GPA 2.5 or better.

M SC 350. Cadet Summer Training Advanced Course**3 Credits (3)**

Advanced Camp. Advanced Camp is a 31-day training event which takes place at Fort Knox, KY. It is designed to assess a Cadet's ability to demonstrate proficiency in basic officer leadership tasks. Cadets are evaluated on their ability to lead at the Squad and Platoon levels, both in garrison and tactical environments. Cadets are mentally and physically tested during a 12-day consequence driven field training exercise that replicates a combat training center rotation. Successful completion of the Advanced Camp is a requirement for commissioning. Consent of Instructor required.

Prerequisite(s): M SC 310, M SC 310 L, M SC 320, and M SC 320 L.

M SC 401. Leadership Challenges and Goal Setting**3 Credits (3)**

Part of the Senior ROTC Advanced Course, this course provides a focus on development of the Army Officer. It is an academically challenging course where Cadets develop knowledge, skills, and abilities to plan, resource, and assess training at the small unit level. Cadets also learn about Army programs that support counseling subordinates and evaluating performance, values and ethics, career planning, and legal responsibilities. At the conclusion of this course, Cadets will be familiar with how to plan, prepare, execute, and continuously assess the conduct of training at the company or field grade officer level. Includes a lab per week overseeing MSL III lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week. May be repeated up to 3 credits. Prerequisite(s): M SC 320

Corequisite(s): M SC 401 L.

M SC 401 L. Leadership Challenges and Goal Setting Lab**1 Credit (1P)**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 401. May be repeated up to 1 credits.

Corequisite(s): M SC 401.

M SC 402. Transition to Lieutenant**3 Credits (3)**

The final course within the Senior ROTC Advanced Course, this course is an academically challenging course where Cadets further develop knowledge, skills, and abilities required of junior officers pertaining to the Army in Unified Land Operations and Company Grade Officer roles and responsibilities. This course includes reading assignments, homework assignments, small group assignments, briefings, case studies, practical exercises, a mid-term exam, and an Oral Practicum as the final exam. The Oral Practicum explores the Cadet's knowledge of how they will be prepared for the 20 Army Warfighting Challenges (AWFC) covered throughout the ROTC Advanced Course. Successful completion of this course will assist in preparing Cadets for their BOLC B course following graduation and commissioning. It is a mandatory requirement for commissioning. Includes a lab per week overseeing MSL III lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week. May be repeated up to 3 credits. Prerequisite(s): M SC 401

Corequisite(s): M SC 402 L.

M SC 402 L. Transition to Lieutenant Lab**1 Credit (1)**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution, and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 402. May be repeated up to 1 credits.

Corequisite(s): M SC 402.

M SC 425. Practicum**1-4 Credits**

Independent projects conducted under the direction of the Professor of Military Science, and concerned with analysis of selected leadership or management problems. Course not eligible for S/U grade. May be repeated up to 16 credits.

**M SC 465 L. Military Decision Making - Graduate Level Lab
1 Credit (1)**

Students will work as part of a planning team in the application of the Military Decision Making Process to planning, coordination, and publish a comprehensive training plan and guidance which outlines all training and activities of the NMSU Army ROTC program for the semester following the semester of the course (i.e. the fall course develops the spring plan). Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 465. May be repeated up to 1 credits. Consent of Instructor required. Consent of Professor of Military Science (PMS) is required and the PMS will interview all prospective students prior to enrolling into this course.

Corequisite(s): M SC 465.

Phone: (575) 646-4030

Website: <https://armyrotc.nmsu.edu/>

Military Science - Undergraduate Minor

The minor in Military Science is administered by the Department of Military Science (Army ROTC) in the College of Arts and Sciences. To obtain a minor in Military Science a student must complete a total of 19 credits, all of which must be upper division. A grade of C- or better must be obtained for each course. The only credits in which a grade of S will be accepted is M SC 350 Cadet Summer Training Advanced Course. Students should contact the Department of Military Science to obtain additional information.

Molecular Biology & Interdisciplinary Life Sciences

Graduate Program Information

Students of the molecular life sciences seek to reduce complex biological processes to a set of understandable molecular or chemical structure and function relationships. Integration of this knowledge into the context of complex living tissues interacting with the environment is the ultimate goal. This requires that the expertise from many diverse traditional disciplines be directed along converging experimental lines. The Ph.D. program in Molecular Biology & Interdisciplinary Life Sciences (MOLB-ILS) is designed to facilitate an interdisciplinary approach to graduate research, utilizing both traditional techniques and the latest advances in biotechnology, including the extraordinary power of recombinant DNA methodology. Participants in this program will take core courses in biochemistry, molecular biology and cell biology. Subsequent course work will be tailored for the individual student, depending upon his or her research emphasis. Participation in regular seminar programs will be expected to provide students with the widest possible scientific background. Financial aid, in the form of a limited number of MB teaching and research assistantships, is available on a competitive basis. Research Assistantships may also be available from individual faculty within the Molecular Biology & Interdisciplinary Life Sciences Graduate Program.

Only the most competitive students are admitted with assistantship support.

The MOLB-ILS program offers curricula leading to the M.S. and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MOLB-

ILS Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 300 combined verbal and quantitative), TOEFL scores of foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding research performance or potential are weighted heavily during the selection process.

Students with a B.S. degree in one of the disciplines listed above can expect to earn the MS degree in about 30 credits, including at least 6 credits of thesis research. The Ph.D. degree can be earned in about 30 to 40 credits of formal course work, plus additional thesis research credits, for a minimum total of 75 credits beyond the B.S. because research is central in both the M.S. and Ph.D. curricula, early selection of a research advisor is required.

Ph.D. degree candidates will successfully complete a written and oral qualifying examination based on their proposed research and the subject matter in the core courses (below) at the end of the first year of study. Also at this time, the master's or doctoral committee is organized to assist in planning a program appropriate to the background and goals of the student. Ph.D. candidates will subsequently complete a comprehensive written examination and oral examination approximately at the end of the second year of study. A final, formal presentation and oral defense of the original research documented in the M.S. or Ph.D. thesis completes the degree requirements.

Master Degree(s)

- Molecular Biology - Master of Science (p. 156)

Doctoral Degree(s)

- Molecular Biology - Doctor of Philosophy (p. 196)

Minors

- Bioinformatics (with Computer Science) - Graduate Minor (p. 213)
- Molecular Biology - Graduate Minor (p. 217)
- Molecular Biology- Undergraduate Minor (p. 770)

A. Ashley, Ph.D. (Colorado State University)– Department of Chemistry and Biochemistry– cellular response to DNA replication stress and damage; maintenance of genomic integrity in eukaryotes; R. Ashley, Ph.D. (Colorado State University)– Department of Animal and Range Sciences– progesterone's actions mediated by membrane receptors, and chemokines' effects in early pregnancy and breast cancer; D. Bailey, Ph.D., (Cornell)– Department of Biology; S. Belteton, Ph.D. (Purdue University) - Dept of Botany and Plant Pathology - Plant tissue morphogenesis; R. Chinnasamy, Ph.D. (National Chemical Laboratory- Pune, India)– Department of Chemistry and Biochemistry; A. Corcoran, Ph.D. (University of California Los Angeles)– Molecular Biology Program; C. Cramer, Ph.D. (North Carolina State University) – onion breeding and horticulture; R. Creamer, Ph.D., (University of California-Davis)– Department of Entomology Plant and Weed Science– plant virology, fungal endophytes; J. Curtiss, Ph.D. (University of Colorado-Boulder)–

Department of Biology— molecular genetics of eye development; S. Fuentes-Soriano, Ph.D. (University of Missouri-Saint Louis)— Department of Animal and Range Science—; I. Guzman, Ph.D. (New Mexico State University)— Department of Plant and Environmental Sciences; K. A. Hanley, Ph.D. (University of California San Diego)— Department of Biology— emerging vector-borne viruses; I. Hansen, Ph.D. (University of Wurzburg, Germany)— Department of Biology— molecular vector biology; S. Hanson (Wisconsin)— Department of Entomology Plant and Weed Science— viral plant pathogens; J. Hernandez Gifford, Ph.D. (Washington State University)— Department of Animal and Range Sciences— reproductive physiology; O. Holguin, Ph.D. (New Mexico State University)— Department of Plant and Environmental Sciences— biochemistry including etabolomics and proteomics with a focus on chemical analysis technique; J. Houston, Ph.D. (Texas A&M University)— Department of Chemical & Materials Engineering— biomedical engineering, flow cytometry, fluorescence dynamics, biophotonics, and instrumentation development; K. Houston, Ph.D. (University of Texas)— Department of Chemistry and Biochemistry— hormonal carcinogenesis; E. Indriolo, Ph.D. (Purdue University) — Department of Biology — plant signaling, molecular biology; M. L. Kahn, Ph.D. (Stanford University) - Biophysics Program — Bacteriophage DNA Replication; G. Lopez-Martinez, Ph.D. (Ohio State University)— Department of Biology— short and long-term effects that single and repeated bouts of environmental stress can have on animals; D.N. Lozada, Ph.D. (University of Arkansas)— Department of Plant and Environmental Sciences; S. Lusetti, Ph.D. (University of Wisconsin-Madison)—Department of Chemistry and Biochemistry— DNA replication, recombination and repair; B. A. Lyons, Ph.D. (Cornell University)— Department of Chemistry and Biochemistry— structure and function relationships in breast and liver cancer cell signaling pathways; B.G. Milligan, Ph.D. (University of California-Davis)— Department of Biology— plant evolutionary biology; N. Pietrasiak, Ph.D. (University of California-Riverside— Department of Plant and Environmental Sciences— cyanobacterial phylogenetics, molecular ecology of terrestrial algae, biocrusts; J. Randall, Ph.D., Program Director (New Mexico State University)— Department of Entomology Plant and Weed Science— molecular plant physiology, genetics, and plant/microbe interactions; I. Ray, Ph.D. (Wisconsin-Madison)— Department of Plant and Environmental Sciences— plant genetic engineering, primary and secondary metabolism, stress, legumes; L. Rodriguez-Urbe, Ph.D. (New Mexico State University)— Department of Plant and Environmental Sciences; A. Romero-Olivares, Ph.D. (University of California Irvine)- Department of Biology- impacts to our ecosystems; E. E. Serrano, Ph.D. (Stanford)— Department of Biology— neuroscience, genetics, science and ethics; C. B. Shuster, Ph.D., (Tufts University)— Department of Biology— regulation of mitosis and cytokinesis, role of the cytoskeleton during early development; G. Smith, Ph.D. (North Carolina State)— Department of Biology-environmental gene probes, microbial biodegradation; J. Song, Ph.D. (Washington)— statistical computing, systems biology, bioinformatics, computer vision; P. Trainor, Ph.D. (University of Louisville)— Department of Economics, Applied Statistics and International Business; J. Xu, Ph.D. (Second Military Medical University, China)— Department of Biology— functional genomics and population genetics of mosquito-malaria interactions; E. Yukl (Oregon Health and Science University) - Department of Chemistry and Biochemistry— structural biology and bioinorganic chemistry; J. Zhang, Ph.D. (University of Arkansas)— Department of Plant and Environmental Sciences— cotton genetics, genomics and molecular biology

Molecular Biology Courses

MOLB 448. Special Research Problems

1-3 Credits

Individual investigation, theoretical or experimental, under the supervision of a molecular biology faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

MOLB 520. Molecular Cell Biology

3 Credits (3)

Same as BIOL 520.

MOLB 542. Biochemistry I

3 Credits (3)

Same as BCHE 542. B or better required.

MOLB 545. Molecular and Biochemical Genetics

3 Credits (3)

Same as BCHE 545 and BIOL 545.

MOLB 546. Biochemistry II

3 Credits (3)

Same as BCHE 546.

MOLB 550. Topics in Molecular Biology

1-3 Credits

Selected topics of current interest in field of molecular biology for master's level students.

MOLB 590. Discussions in Molecular Biology

1 Credit (1)

Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and three times for doctoral students. Graded by 2 options: S/U or Letter Grade

MOLB 597. Laboratory Rotations/Research Discussions

1-3 Credits

All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.

MOLB 598. Special Research Programs

1-3 Credits

Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.

MOLB 599. Master's Thesis

1-15 Credits (1-15)

Experimental and scholarly research leading to the preparation of a master's thesis.

MOLB 600. Molecular Biology Research

1-15 Credits

Laboratory research efforts prior to successful completion of doctoral comprehensive exam.

MOLB 650. Advanced Topics in Molecular Biology

1-3 Credits

Discussions and lectures on topics of current interest in molecular biology for doctoral students.

MOLB 698. Advanced Research Projects

1-9 Credits

Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.

MOLB 700. Doctoral Dissertation Research**1-15 Credits**

Research for doctoral students after completing comprehensive exams.

Name: Molecular Biology & Interdisciplinary Life Sciences Graduate Program

Office Location: W361 Chemistry Building

Phone: (575) 646-3437

Website: <http://molb.nmsu.edu>

Facebook: <https://www.facebook.com/nmsumolbio>

Twitter: <https://twitter.com/MolbNmsu>

Molecular Biology- Undergraduate Minor

The Molecular Biology Program offers opportunities for students to gain theoretical training and hands-on experience in the methods of molecular biology, cellular biology, and/or bioinformatics. A formal undergraduate minor in Molecular Biology is offered and is described below; a grade of C or better is required to certify the courses. A minor in Bioinformatics is currently under development; for planning purposes, please refer to the program office for the most recent drafts of the Bioinformatics minor requirements.

This program consists of a minimum of 18 hours, distributed through five or six areas.

Prefix	Title	Credits
Organic Chemistry:		4-5
CHEM 314	Organic Chemistry II	
CHEM 315	Organic Chemistry Laboratory	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
Introductory Genetics:		3
AGRO 305	Principles of Genetics	
ANSC 305	Principles of Genetics	
BIOL 305	Principles of Genetics	
HORT 305	Principles of Genetics	
Cell Biology:		3
BIOL 377	Cell Biology	
BIOL 490	Neurobiology	
Advanced Genetics:		3
BCHE 396	Biochemistry II, Lecture and Laboratory	
BIOL 478	Molecular Biology of Microorganisms	
Additional Advanced Courses: ¹		5
BCHE 424	Experimental Biochemistry I	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 477	Applied and Environmental Microbiology	
TOX 461	Toxicology I	
Total Credits		18-19

¹ Additional credit hours from the following, or additional courses from any of the above five areas, as needed to meet a minimum of 18 credit hours

Successful completion of the minor will be certified by the Molecular Biology Program. A grade of "C" or better is required of all minor courses.

Music

Undergraduate Program Information

Mission Statement

The mission of the Music Department at NMSU is:

1. to prepare students for careers in music education, business and/or performance;
2. to give the student body opportunities to perform, study, create and experience music;
3. to enhance the cultural lives of our constituency by performance of superior music; and
4. to create an artistic environment which fosters the development of personal realizations we believe to be essential to the fabric of a healthy society.

All students are required to meet the State Common Core as listed in earlier sections of this catalog. Please see a Music Department advisor for a specific list of courses.

Admission into the Program

For a student to be officially accepted as a Music major or minor, he/she must do the following:

- perform an audition for a panel of no less than three Music faculty members
 - one of whom must be the director of his/her program area
 - one of whom must be the applied teacher of the student's principal instrument

Any student declaring Music as his/her major may be accepted for a one-semester probationary period. During that first semester, the Music faculty will determine if the student has the necessary skills and work ethic to continue as a major. The student's course work, ensemble participation and applied jury will be the basis for the decision to allow the student to continue or not.

Departmental Requirements for all Bachelor's Degrees (Music Core)

A student must earn a grade of C- or better in all departmental requirements for any degree in the Department of Music. All students wishing to pursue a music degree must audition and take the theory placement exam. Contact the department for current audition requirements.

If students change major(s) or minor(s) or do not complete the requirements for the minor at the time of graduation, they may only count a maximum of 9 credits of the applied/occupational credits toward graduation.

Recital Requirements for Music Performance and Education Degrees

Bachelor of Music

All performance majors are required to give a half recital (30 minutes of music) in the junior year and a full recital (60 minutes of music) in the senior year.

Bachelor of Music Education

All music education majors will give a half recital (30 minutes of music) in their major performance area.

B.A. Degree Program of Study/Capstone Project

All B.A. Degree Students must submit and have approved a Program of Study by the end of their Sophomore year. Programs of study will be submitted to the B.A. Degree coordinator and will determine a focus for elective courses and the Capstone Project. The Capstone Project will be derived from the program of study.

Applied Music Requirements for All Music Degrees

Music Education and Music Performance degrees require at least two semesters of applied music study at the 430 level. Students pursuing a Bachelor of Arts Degree in Music (any track) must complete at least four semesters of applied music study at the 230 level and at least two semesters at the 330 level. B.A. students may take applied lessons at the 430 level, but it is not a requirement for this degree path.

All students enrolling in applied music will audition and obtain permission from an applied teacher before enrolling for applied music credit.

Students may obtain further information by contacting the music department.

Other Music Requirements, Fees and Regulations

1. A Piano Proficiency Examination is required of all music performance and music education majors. Each student must enroll in Functional Piano or Applied Piano every semester, until the Proficiency is passed. Detailed requirements may be obtained from the Department of Music office. Students must pass the piano Proficiency Exam before presenting a Senior Recital.
2. Qualitative grade-point average for graduation in music is 2.0 or higher. All grades in required music courses must be C- or better.
3. An instrument rental fee is charged each semester for students using university instruments. Consult the music department concerning these fees.
4. All applied students pay an additional fee. Consult the music department concerning these fees.
5. Outside groups and individuals must have special permission to use music department facilities. Contact the music office for additional information.

Music Ensemble

All students majoring or minoring in Music, must enroll and participate in the ensemble appropriate for their particular degree plan. The appropriate ensemble will be determined by degree requirements in consultation with the student's advisor and ensemble directors. The student must enroll each and every semester he/she is considered full-time until the degree requirements are met, for a minimum of 8 semesters (Music

Performance), 7 semesters (Music Education), 6 semesters (B.A. Degrees). Any student receiving any kind of financial assistance through the Music Department must enroll each and every semester while he/she is attending NMSU. Music Education Students will not receive Music Scholarship funds during their semester of Student Teaching. For more information, contact the Music Office.

Music Scholarships and Awards

Scholarships and grants for music majors are administered through the performance areas. To be eligible for a music major scholarship or grant, students must first be admitted into the program. Program admission requirements include an audition for a panel of no less than three Music faculty members. One must be the major ensemble director of his/her program area (band, choir, opera, orchestra, keyboard). One must be the applied teacher of the student's principal instrument and the other must be a full-time Music faculty member from any area. Specific audition information and requirements for each performance area can be found on the Auditions page (<https://music.nmsu.edu/admissions/auditions.html>). (<https://theatre.nmsu.edu/auditions/audition-faqs.html>)

In order to have all paperwork processed before the beginning of the Fall semester, students are encouraged to have all scholarship and financial aid application materials in to the Office of Financial Aid by March 1.

The most up to date information on scholarships and grants can be obtained from the Coordinator of Scholar Dollar\$ in the office of the Dean of Arts and Sciences in Breland Hall.

For more information on any of the following scholarships please call (575) 646-2421 or email music@nmsu.edu.

Service awards for non-majors are available based upon ensemble need and funding availability. For more information regarding these awards or to set up an audition, please contact one of the following:

- **Winds and Percussion:** (575) 646-2304
- **Vocal:** (575) 646-2304
- **Strings:** (575) 646-1647
- **Keyboard:** (575) 646-2228

Graduate Program Information

The Master of Music degree is offered in the following areas of study: Conducting, Music Education and Performance. Applicants are expected to have an undergraduate degree in music or music education equivalent to that represented by the BM or BME degree from New Mexico State University. The music department does not require the Graduate Record Exam, but does expect each applicant to possess graduate-level language and writing skills. For admission into the Master of Music degree program, all applicants must have an undergraduate GPA of at least 3.0 and submit at least two letters of recommendation from music professionals. An audition, either in person or by recording, is required for entrance into the Performance or Conducting programs. Auditions will be based upon, but not limited to, prescribed repertory.

For acceptance into the Music Education program, the applicant must have completed a Bachelor of Music Education degree comparable to the one offered by NMSU or take the requisite undergraduate courses at NMSU leading to state licensure before enrolling in graduate courses. (Contact the Music Department for details.)

Note: The degree offered is a Master of Music. The student's official transcript and diploma will only indicate that degree. The area of study

(Conducting, Music Education, Performance) will not be included as part of the official degree title.

Recital Requirements for Performance and Conducting

A graduate recital plus an analytical paper are required of all candidates in Performance and Conducting. Students must be enrolled in their applied area during the semester the recital is given. A minimum of 60 minutes of music is required for all Performance recitals. A minimum of three major works for the appropriate ensemble is required for all Conducting recitals. The recital may only be given after at least 6 hours of graduate applied or conducting courses have been successfully completed.

Program of Study and Committee Selection

After admission, each student must successfully complete MUSC 471 Graduate Theory Review before subsequent enrollment in other music theory courses. He or she must also successfully complete MUSC 477 Graduate Music History Review before subsequent enrollment in other music history courses.

During the first semester of study, a tentative Program of Study is planned, documented and filed by the student in consultation with the advisor in his or her major field. The Program of Study is subject to approval by the Music Department Head and the Graduate Music Committee. The student will also select, in consultation with his or her advisor, an advisory committee consisting of the advisor, and two additional faculty members.

Candidacy

In order to qualify for candidacy the student (except those in the online Music Education program) must meet the Graduate School requirement of 12 credits of graduate work in residence and must show evidence of a satisfactory quality of work in the required courses, demonstrate the desired progress in his or her performance area and, where required, submit a recital program, thesis topic, or project proposal for approval.

Thesis

A thesis is optional in Music Education and is encouraged for students considering completion of a terminal degree. Music Education candidates not writing a thesis must develop and complete an approved project before the oral examination.

Final Examination

All Master of Music candidates must take a final comprehensive oral examination. The final oral examination may not be scheduled until the graduate recital (with analytical paper) is completed or a final draft of the Music Education project or thesis has been approved by the candidate's advisor.

Fees

Fees, in addition to tuition, will be assessed for all applied hours and recitals. (Consult the Music Department for details).

Degrees for the Department

Bachelor Degree(s)

- Music (Instrumental Performance) - Bachelor of Music (p. 790)
- Music (Piano Performance) - Bachelor of Music (p. 791)
- Music (Pre-Music Therapy) - Bachelor of Arts (p. 784)
- Music (Pre-Speech Language Pathology) - Bachelor of Arts (p. 786)
- Music (Theatre) - Bachelor of Arts (p. 788)

- Music (Vocal Performance) - Bachelor of Music (p. 793)
- Music - Bachelor of Arts (p. 783)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 795)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 797)

Master Degree(s)

- Music (Conducting) - Master of Music (p. 157)
- Music (Music Education) - Master of Music (p. 157)
- Music (Music Education) - Master of Music (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/music-music-education-mm-online/>)
- Music (Performance) - Master of Music (p. 158)

Minors for the Department

- Music - Undergraduate Minor (p. 799)

Professor, Fred Bugbee, Department Head

Professors Chaffin, Kaplan, Shearer, Spitzer; **Associate Professors** Daughtrey, Espinoza, Mapp, Martinez-Rios, L. Van Winkle, Vega-Albela; **Assistant Professors** Moore, Smyth, J. Taylor; **College Associate Professors** R. Taylor

F. Bugbee, Department Head, D.M.A. (Eastman School of Music)– percussion, history; L. Chaffin, Ph.D. (Texas Tech)– theory, composition; S. Daughtrey, D.M. (Indiana University)– vocal coordinator, diction, pedagogy; J. Espinoza, M.M. (Carnegie Mellon)– viola, ear-training; A. Kaplan, Ph.D. (NYU Manhattan School of Music)– low brass; M. Mapp (Kansas University)– Director of Bands, conducting; J. Martinez-Rios, M.M. (Western Michigan)– Orchestra Director, viola; M. Moore, D.M.A. (Kansas University)– clarinet, woodwind techniques; J. Shearer, D.M.A. (Eastman School of Music)– graduate coordinator, history; S. Smyth, D.M.A. (Kansas University)– Athletic Bands, music education; L. Spitzer, D.M.A. (USC)– piano, history; J. Taylor, D.M.A. (Texas Tech)– Director of Choral Studies, music education R. Taylor, D.M.A. (Arizona)– saxophone, theory; L. Van Winkle, D.M.A. (Arizona) flute, ear-training; D. Vega-Albela M.M. (Western Michigan)–violin

Music Courses

MUSC 1110G. Music Appreciation: Jazz

3 Credits (3)

This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Jazz from various cultures and times.

Learning Outcomes

1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1130G. Music Appreciation: Western Music**3 Credits (3)**

This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Western music from various cultures and times.

Learning Outcomes

1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1210. Fundamentals of Music for Non-majors**3 Credits (3)**

A beginning course in the fundamentals of music, this course includes notation, scales, key signatures and intervals. Aural comprehension is introduced through singing intervals, scales and triads and dictating simple rhythmic and melodic patterns and students explore the basic components of music. Traditional Grading with RR.

Learning Outcomes

1. Demonstrate and apply standard notation of pitch, rhythm, scales, intervals, key signatures, triads, and simple melodic and harmonic composition
2. Develop and improve basic aural skills
3. Read musical notation
4. Improve and expand understanding of fundamental musical techniques and concepts

MUSC 1310. Recital Attendance**0.5 Credits (.5+1P)**

This course is for music students to attend and participate in a good number of convocation, concert, and recital performances, creating a wider appreciation for the performing arts. May be repeated up to 4 credits. Restricted to: Music and Music Education majors. S/U Grading with RR. Restricted to Las Cruces campus only.

Learning Outcomes

1. Encourage student observation of serious music
2. Provide opportunities for public performances
3. To create a greater sense of community within the student body

MUSC 1410. Introduction to Music Education**2 Credits (2)**

This course is an overview of teaching in the music classroom through readings and observations. Students will be introduced to the skills needed to become a reflective educator, develop observation techniques, and demonstrate knowledge of the current state of the profession.

Restricted to Las Cruces campus only.

Learning Outcomes

1. Make observations and analyze the current state of musical education in public schools
2. Describe characteristics of good teaching in music
3. Articulate a personal philosophy of music education
4. Reflect on personal strengths and weaknesses as a teacher of music

MUSC 1440. Class Voice I**1 Credit (1)**

Group instruction in voice and vocal pedagogy for instrumental Music Education majors, offering basic principles of healthy vocal production with particular attention to diction, development of vocal range, and the ability to impart that knowledge to elementary, junior and/or high school age students. Restricted to: Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Learning Outcomes

1. Provide the basic understanding of healthy vocal production. Including, but is not limited to, the following topics: Expanding vocal range; Learning how to practice and learn songs effectively and efficiently; Provide basic understanding of vocal pedagogy; Introduction to diction
2. Aims to equip students with the ability to impart that knowledge to elementary, junior and/or high school age students.

MUSC 1450. Ear Training I**1 Credit (1)**

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Traditional Grading with RR. Restricted to Las Cruces campus only.

Prerequisite(s): Passing the Theory Placement exam or making a C or better in MUSC 1210.

Learning Outcomes

1. Counting rhythms at sight using the Eastman Counting System
2. Singing melodies at sight using solfege syllables
3. Writing out rhythmic patterns
4. Writing out melodic patterns
5. Identifying and singing intervals
6. Identifying and singing chord / triad qualities

MUSC 1451. Ear Training II**1 Credit (1)**

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C- or better in MUSC 1450.

Learning Outcomes

1. Counting rhythms at sight using the Eastman Counting System
2. Singing melodies at sight using solfege syllables
3. Writing out rhythmic patterns
4. Writing out melodic patterns
5. Identifying and singing intervals
6. Identifying and singing chord / triad qualities

MUSC 1460. Music Theory I**3 Credits (3)**

Introduction to vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis.

Prerequisite(s): Passing the Theory Placement exam or making a C or better in MUSC 1210.

Learning Outcomes

1. To learn the vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis

MUSC 1461. Music Theory II**3 Credits (3)**

Expansion of vocabulary and syntax of 4-voice 18th c. chorale music through study, harmonic analysis, and part writing.

Prerequisite(s): Grade of C or better in MUSC 1460.

Learning Outcomes

1. To expand and apply the vocabulary and syntax of 4-voice, 18th c. chorale music through study, harmonic analysis, and part writing.

MUSC 1470. Functional Piano I**2 Credits (2)**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Learning Outcomes

1. 5 finger hand position in all keys
2. I-IV-I-V7-I cadences in all keys
3. One octave scales with hands together in C, G, D and F (major and minor)
4. Root position cross-over triads, solid and broken (major and minor)
5. Simple sight reading, harmonizing and transposition
6. Prepared pieces from the textbook
7. Simple improvisation
8. Play 2 simple vocal exercises
9. Identify intervals, key signatures and chords 1
10. Correct posture and hand position 1
11. Musical issues such as phrasing, slurs and dynamics 1
12. Good practice habits and techniques

MUSC 1471. Functional Piano II**2 Credits (2)**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Prerequisite: MUSC 1470 or consent of instructor.

Learning Outcomes

1. Two octave scales with hands separate in C, G, D, A, E, B and F (major and minor)
2. I-IV-I-V7-I cadences in above mentioned keys in root position and 1st inversion
3. Simple sight reading, harmonization and transposition
4. Prepared pieces from the book
5. Simple improvisation
6. Identify intervals, key signatures and chords
7. Correct posture and hand position
8. Musical issues such as phrasing, slurs and dynamics
9. Good practice habits and techniques

MUSC 1472. Functional Piano III**2 Credits (2)**

For music majors preparing for the Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Prerequisite: MUSC 1471 or consent of instructor.

Learning Outcomes

1. Keys learned in previous semesters, adding F# and C# (D flat)
2. Secondary dominant chords added to cadence patterns
3. Two-octave, , root position arpeggios, major and minor
4. Intro to chord charts, harmonization
5. More difficult sight-reading and transpositions
6. More difficult prepared pieces
7. Accompany a piece for any instrument on the Mid-Term Recital (required)

MUSC 1992. Applied Music**1-2 Credits (1-2)**

Private or group instruction for non-music majors, secondary instruments, and music majors preparing for 2000-level applied music.

May be taken for unlimited credit. May be repeated up to 99 credits.

Learning Outcomes

1. Development of Musical Abilities.
2. Development of Technical Abilities.

MUSC 2110. Chamber Ensemble**1 Credit (1)**

This course is an exploration of chamber ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of chamber ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 16 credits. Restricted to Las Cruces campus only.

Prerequisite(s): by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2120. Major Ensemble**1 Credit (1)**

This course is an exploration of major ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of major ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 24 credits.

Prerequisite: by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2130. Jazz Ensemble**1 Credit (1)**

This course is an exploration of jazz ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of jazz ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

Prerequisite(s): By audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage
6. Develop and improve improvisation skills

MUSC 2132. Percussion Ensemble**1 Credit (1)**

Study and performance of contemporary percussion ensemble literature. May be repeated up to 5 credits. Restricted to Las Cruces campus only.

Prerequisite(s): by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2151. An Introduction to World Music, Jazz and Music Research
3 Credits (3)

Introduces world music and jazz within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works. A major component will be the development of effective research and scholarly writing skills for the music major or minor. May be repeated up to 3 credits. Restricted to: Music majors and minors. Restricted to Las Cruces campus only.

Learning Outcomes

1. This course will cover fundamental concepts and styles associated with world music (ethnomusicology), jazz and popular music, an overview of the Western European tradition, and an intense focus on research and writing about music.
2. Emphasis will be placed on writing skills as they apply to the college experience in general and the world of music education and performance in particular.
3. Students will become acquainted with the diverse ways cultures create and are affected by their respective musical arts.
4. Focus will be on style evolution, forms, genres, composers, literature, and, where appropriate, performers

MUSC 2210. Diction I**2 Credits (2)**

This course is designed to prepare students for singing in multiple languages using concepts of the International Phonetic Alphabet. Students will work to master the basics of phonetic singing to improve their overall musical abilities. Restricted to Las Cruces campus only.

Learning Outcomes

1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing
5. Gain fluency, accuracy, and confidence in pronunciation of sung text

MUSC 2220. Diction II**2 Credits (2)**

This course serves as a continuing study in the concepts of the International Phonetic Alphabet. Students will continue to improve and practice their diction to develop their singing and musical abilities in order to begin the mastery of lyric diction. Restricted to music majors. Restricted to Las Cruces campus only.

Prerequisite: MUSC 2210 or consent of instructor.

Learning Outcomes

1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing.
5. Gain fluency, accuracy, and confidence in pronunciation of sung text.
6. Demonstrate ability to notate song texts according to IPA standards

MUSC 2240. Music History and Literature: Antiquity through Baroque
3 Credits (3)

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from antiquity through the end of the Baroque era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: M ED, MUSC majors.

Prerequisite(s): A grade of C- or better in MUSC 1450, 1460, and 2151.

Learning Outcomes

1. The purpose of the course is to survey the beginning history of music from the earliest ancient times through the Baroque period, ca. 175

MUSC 2310. Sound and Music Technology**1 Credit (1)**

This course serves as an overview of current technologies and principles for the recording and production of sound, and the use of computer-based technologies for the production of music. Restricted to: MUSC, M ED majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Prerequisite(s): MUSC 1460.

Learning Outcomes

1. Demonstrate fundamental knowledge of techniques and practices of music recording and production
2. Demonstrate ability to properly use computer-based technologies to produce and record music
3. Demonstrate ability to create music recordings
4. Work with a variety of recording, production, and sound reinforcement tools
5. Apply basic and mixed editing techniques
6. Use audio editing and file management techniques
7. Demonstrate knowledge of music technology vocabulary
8. Explain and understand the development of various music technologies

MUSC 2451. Ear Training III**1 Credit (1)**

Continuation of MUSC 1451, advanced sight singing, dictation. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C- or better in MUSC 1451.

Learning Outcomes

1. Count rhythms at sight using the Eastman Counting System
2. Sing melodies at sight and prepared using Solfege syllables
3. Write out rhythmic patterns
4. Write out melodic patterns
5. Identify and singing intervals
6. Identify and sing chord / triad qualities
7. Write out harmonic dictation

MUSC 2452. Ear Training IV**1 Credit (1)**

Continuation of MUSC 2451, advanced sight singing, dictation. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C or better in MUSC 2451 and MUSC 2460.

Learning Outcomes

1. Count rhythms at sight using the Eastman Counting System
2. Sing scales and sequences as assigned for the level
3. Sing melodies at sight using solfege syllables
4. Write out rhythmic patterns in both simple and compound meters
5. Write out melodic patterns in both major and minor tonalities
6. Identify, label and sing intervals
7. Identify, label and sing chords and extended harmonic qualities, i.e. V7 and inversions
8. Write out harmonic progressions in both two and four part forms including secondary dominants and modulations.
9. Accurately detect melodic and rhythmic errors in dictation examples.

MUSC 2460. Music Theory III**3 Credits (3)**

Analysis of Baroque and Classical Music. Vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C or better in MUSC 1461.

Learning Outcomes

1. To learn and apply the vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition.
2. Topics covered include: Two-Voice Eighteenth Century Counterpoint; Fugue; Borrowed Chords; Neapolitan 6th Chords; Augmented 6th Chords; Sonata Form; Rondo Form.

MUSC 2461. Music Theory IV**3 Credits (3)**

Analysis of Romantic, Post-Romantic, Impressionist, and Twelve-Tone Music. Vocabulary and syntax of late 19th and early 20th c. Western art music through study, micro/macro analysis, and composition. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C or better in MUSC 2460.

Learning Outcomes

1. To learn and apply the vocabulary and syntax of late 19th and early 20th c. music through study, micro/macro analysis, and composition.

MUSC 2470. Functional Piano IV**2 Credits (2)**

For music majors preparing for Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option. May be repeated up to 99 credits.

Prerequisite: MUSC 1472 or consent of instructor.

Learning Outcomes

1. Keys learned in previous semesters, adding A flat, E flat, and B flat
2. Secondary dominant chords added to cadence patterns, all inversions
3. Arpeggios, all inversions
4. More difficult sight-reading and transpositions
5. More difficult prepared pieces
6. Four part pieces (hymns)
7. Accompany a piece for any instrument on the Mid-Term Recital (required) Score reading and transposition

MUSC 2510. Applied Music I**1-4 Credits**

Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required.

Restricted to: Music and Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Prerequisite(s): Audition.

Learning Outcomes

1. Varies

MUSC 2740. Pride Marching Band**1 Credit (1)**

The Pride Marching Band performs at all NMSU home football games and select away games. The marching band is open to all students at NMSU and supports both instrumental and visual units. May be repeated up to 8 credits.

Learning Outcomes

1. To cultivate within the student a value system that encourages community service.
2. To provide the performer with experiences that will enable them to communicate thoughts/ideas/emotions in a unique and personal manner using his/her instrument, body, and physical motion.
3. To instill in students a commitment to life-long learning.
4. To promote personal growth through the rehearsal and performance of music, choreography, and drill of high quality.
5. To encourage students to continuously participate in and support artistic performances following graduation.

MUSC 2993. Opera Workshop**1 Credit (1)**

Study, translation, analysis, rehearsal and performance of opera. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

Prerequisite(s): by audition only.

Learning Outcomes

1. Varies

MUSC 2996. Special Topics I**1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

Learning Outcomes

1. Varies

MUSC 301. Marching Band Techniques**2 Credits (2)**

This course will help students develop the techniques needed to administer and teach all aspects of a contemporary high school marching band. This includes drill conception and design, instruction, organization, and administration. Stylistic varieties of marching fundamentals, show conception, fundamentals of charting and teaching drill, computer-aided drill design, traditional show design, contemporary show design, rehearsal techniques, and organizational concepts. Restricted to: Music, Music Education majors. Traditional Grading with RR.

MUSC 302. Music History and Literature: Classic through Romantic**3 Credits (3)**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginnings of the Classic era through the end of the Romantic era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: Music Majors and Minors majors.

Prerequisite(s): A grade of C- or better in MUSC 2240.

MUSC 303. Music History and Literature: 20th Century Through the Present**3 Credits (3)**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginning of the 20th Century through the Present. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: MUS minors and majors.

Prerequisite(s): A grade of C- or better in MUSC 302.

MUSC 315. Brass Techniques I**1 Credit (1)**

Methods and techniques of teaching high brass instruments, for music education majors. Main campus only.

MUSC 316. Brass Techniques II**1 Credit (1)**

Methods and techniques of teaching low brass instruments, for music education majors. Main campus only.

MUSC 317. Woodwind Techniques I**1 Credit (1)**

Methods and techniques of teaching high woodwind instruments, for music education majors. Main campus only.

MUSC 318. Woodwind Techniques II**1 Credit (1)**

Methods and techniques of teaching saxophone and double reed instruments, for music education majors. Main campus only.

MUSC 319. String Techniques I**1 Credit (1)**

Methods and techniques of teaching low string instruments, for music education majors. Main campus only.

MUSC 321. Instrumental Techniques for Vocal Music Education Majors
2 Credits (2)

Methods of teaching brass, woodwind, percussion, stringed and fretted instruments for vocal music education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 322. Guitar Methods**1 Credit (1)**

Methods and techniques of teaching guitar, for Music Education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 323. Percussion Technique I**1 Credit (1)**

Methods and techniques of teaching fundamental percussion instruments (snare drum, timpani, keyboards and essential accessories). May be repeated up to 1 credits. Restricted to: MUS, M ED majors.

MUSC 324. Percussion Technique II**1 Credit (1)**

Methods and techniques of teaching marching percussion, drum set, and a continuation of techniques discussed in MUS 323. May be repeated up to 1 credits. Restricted to: MUS, M ED majors. Traditional Grading with RR.
Prerequisite(s): A grade of C- or better in MUS 323.

MUSC 325. Beginning Conducting**1 Credit (1)**

A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning technique applicable to all ensembles. Reading of musical scores with application via laboratory ensemble experience is included. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 2452 and MUSC 2461.

MUSC 326. Instrumental Conducting**3 Credits (3)**

Will continue from MUSC 325 in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques as it relates to the instrumental ensemble. The class will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. May be repeated up to 3 credits. Restricted to: MUS, M ED majors. Traditional Grading with RR.

Prerequisite(s): A grade of C- or better in MUSC 325.

MUSC 327. Choral Conducting**3 Credits (3)**

Continuation of conducting study with emphasis on choral rehearsal techniques, ensemble management, and literature. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 325.

MUSC 330. Applied Music II**1-4 Credits**

Continuation from MUS 230. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 2992 plus a juried audition.

MUSC 340. Junior Recital**1 Credit (1)**

Public solo performance under the supervision of the appropriate applied instructor. 30 minutes of musical performance is required. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Corequisite(s): MUSC 330.

MUSC 341. BA Capstone**1-2 Credits (1-2)**

The objective of the Capstone course for the BA degree in Music is to demonstrate the accumulation, understanding and knowledge of the student's course of study. This will take the form of an analytical paper, recital, research paper, composition or other equally encompassing project approved by the Instructor of Record. This may involve coursework from the student's minor area of study and be a multi-disciplinary collaborative effort. Restricted to: Music majors.

Prerequisite(s): A B- or better in MUSC 2460 and MUSC 302.

MUSC 346. Elementary Music Methods**2 Credits (2)**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in an elementary school. Emphasis on methodology of Kodaly and Orff, teaching in a multicultural setting, and developing reflective practitioners. This course requires field experience in the public schools. Restricted to: Music Education majors.

Prerequisite(s): A grade of C or better in MUSC 1410 and passing the TEP exam.

MUSC 349. Secondary Music Methods**2 Credits (2)**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on teaching in a multicultural setting and developing reflective practitioners. Restricted to: Music Education majors.

Prerequisite(s): A grade of C or better in MUSC 346.

MUSC 350. Chamber Music**1 Credit (1)**

Small performing ensembles that may include strings, woodwinds, brass, pianos, percussion, and voices. May be repeated up to 16 credits.

Prerequisite(s): by audition only.

MUSC 351. Opera Workshop**1 Credit (1)**

Study, translation analysis, rehearsal and performance of opera. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 360. Special Topics II**1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

MUSC 361. Concert Choir II**1 Credit (1)**

Composed of both music and nonmusic majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. Students must assume leadership role. May be repeated up to 88 credits.

Prerequisite(s): by audition only.

MUSC 362. Philharmonic Orchestra II**1 Credit (1)**

The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 363. Jazz Ensembles II**1 Credit (1)**

Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 365. Composition I**2 Credits (2)**

Significant forms for various media. Emphasis on structural aspects of original composition. May be repeated up to 2 credits.

Prerequisite: A grade of B or better in MUSC 1460.

Learning Outcomes

1. Demonstrate the ability to analyze a variety of musical compositions
2. Demonstrate the ability to develop musical compositions from basic melodic, harmonic, rhythmic, and formal structures
3. Create new musical compositions from variety of perspectives for smaller chamber ensembles

MUSC 368. University Singers II**1 Credit (1)**

Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits. Consent of Instructor required.

Prerequisite(s): by audition only.

MUSC 370. Wind Symphony II**1 Credit (1)**

This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 372. Marching Band II**1 Credit (1)**

Composed of both majors and nonmajors. Opportunity to perform all varieties of music in a contemporary style marching unit. May be repeated up to 5 credits. Consent of Instructor required. Traditional Grading with RR.

MUSC 374. Percussion Ensembles II**1 Credit (1)**

Study and performance of contemporary percussion ensemble literature. Students must assume a leadership role. May be repeated up to 5 credits.

Prerequisite(s): by audition only.

MUSC 380. Symphonic Band II**1 Credit (1)**

This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 386. Applied Music Pedagogy and Literature I**2 Credits (2)**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 390. Survey of Wind Literature**2 Credits (2)**

An examination of beginning to advanced literature for wind bands with an emphasis on the needs of middle and high school ensembles. It will include a means to determine the quality of a piece as well as the standardized level of difficulty (grading). Restricted to: Music and Music Education majors.

Prerequisite(s): A grade of C- or better in MUSC 2452 and MUSC 2461.

MUSC 391. Survey of Orchestral Literature**2 Credits (2)**

An examination of beginning to advanced literature for both string orchestra and symphony orchestra with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. May be repeated up to 2 credits.

Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.

Learning Outcomes

1. Identify significant composers and compositions that are appropriate for all grade levels and applicable to teaching music through a performance-based environment in an orchestral setting
2. Determine the quality of a work based on aesthetic ideals
3. Determine appropriate programming strategies and repertoire selection dependent upon level of difficulty and/or varying ability levels.

MUSC 392. Survey of Choral Literature**2 Credits (2)**

An examination of beginning to advanced literature for choir with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.

Prerequisite(s): A grade of C- or better in MUSC 2452 and MUSC 2461.

MUSC 393. Instructional Strategies I for Instrumentalists**2 Credits (2)**

An examination of beginning to advanced literature for instrumentalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills.

Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 394. Instructional Strategies II for Instrumentalists**2 Credits (2)**

The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students must also passing the TEP exam in order to enroll in this course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. The development of rehearsal techniques for middle and high school ensembles

MUSC 395. Instructional Strategies I for Vocalists**2 Credits (2)**

An examination of beginning to advanced literature for vocalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills. Students must also pass the TEP exam to enroll in this course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 396. Instructional Strategies II for Vocalists**2 Credits (2)**

The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students will also need to pass the TEP exam in order to enroll in the course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. The development of rehearsal techniques for middle and high school ensembles.

MUSC 397. Administrative Music Methods**1 Credit (1)**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on administration. Students must also pass the TEP exam to enroll in this course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. Gain insight and experience with administrative strategies and procedures in secondary classroom
2. Work on interview skills as well as resume and cover letter composition
3. Collect a set of usable tools that a student can carry with them into their first job.
4. Gain familiarity with laws and regulations regarding programs and money spent

MUSC 413. Form and Analysis**3 Credits (3)**

Forms in tonal music and basic analytic techniques including music from diverse cultures and media.

Prerequisite(s): A grade of C- or better in MUSC 2452 and MUSC 2461.

MUSC 415. Orchestration**3 Credits (3)**

Scoring for full orchestra and various instrumental combinations with consideration of instrument timbres, strengths, weaknesses and ranges. Restricted to: Music and Music Education majors.

Prerequisite(s): A grade of C or better in MUSC 2452 and MUSC 2461.

MUSC 417. Studio Accompanying**2 Credits (2)**

Practical application of collaborative piano skills in a studio setting for Piano Performance majors. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 421. Music of the Baroque Era**3 Credits (3)**

An overview of the music of the Baroque era with an emphasis on history and literature. May be repeated up to 3 credits.

Prerequisite: MUSC 303.

Learning Outcomes

1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 422. Music of the Classic Era**3 Credits (3)**

An overview of the music of the Classic era with an emphasis on history and literature.

Prerequisite(s): MUSC 303.

MUSC 424. Music of the Twentieth Century**3 Credits (3)**

An overview of the music of the Twentieth Century with an emphasis on history and literature. Consent of Instructor required.

Prerequisite(s): MUSC 303.

MUSC 429. Opera: History and Literature**3 Credits (3)**

An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: Music, Music Education majors.

Prerequisite(s): MUSC 303 or consent of instructor.

Learning Outcomes

1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 430. Applied Music III**1-4 Credits**

Continuation from MUS 330. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 330 plus a juried audition.

MUSC 440. Senior Recital**1-2 Credits (1-2)**

Public solo performance under the supervision of the appropriate applied instructor. 60 minutes of musical performance is required for enrollment of 2 hours credit. 30 minutes of musical performance is required for enrollment of 1 hour credit. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Corequisite(s): MUSC 430.

MUSC 441. Supervised Studio Teaching**2 Credits (2)**

Teaching of private lessons under supervision. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 450. Research Methods**3 Credits (3)**

Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Restricted to majors. Main campus only. No S/U option.

Prerequisite: consent of instructor.

MUSC 455. Music Business Internship**3 Credits (3)**

Capstone course for the Music Business degree. Working with the music business coordinator, students must have been accepted as an intern in a music business setting before enrolling. Credit given for the internship based on criteria developed for each placement. Restricted to majors. S/U only.

Prerequisites: MUSC 330 and piano proficiency.

MUSC 470. Special Topics III**1-3 Credits**

Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit.

MUSC 471. Graduate Theory Review**3 Credits (3)**

Comprehensive and accelerated study of modes, diatonic harmony, and classical form of the common practice period. Restricted to: Music majors. Traditional Grading with RR.

MUSC 475. Intermediate Conducting**3 Credits (3)**

Serves as a bridge from undergraduate conducting study to the graduate level. Advanced undergraduate students may enroll to learn how the graduate program in conducting functions. The course also serves as the introductory experience for newly admitted graduate conducting majors. After successful completion of this course, students will be able to: Study musical scores from a conducting perspective; Demonstrate effective predetermined gestures and movements; Lead an ensemble; Research and give presentations related to composers and their music; Demonstrate advanced knowledge of conducting practices.

Prerequisite(s): A grade of C- or better in MUSC 326 or MUSC 327.

MUSC 477. Graduate Music History Review**3 Credits (3)**

Comprehensive and accelerated study of music history from antiquity to the present. Restricted to: Music majors. Traditional Grading with RR.

MUSC 486. Applied Music Pedagogy and Literature II**2 Credits (2)**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music majors. Traditional Grading with RR.

MUSC 498. Independent Study**1-3 Credits**

For students with a strong musical background wishing to explore content beyond the traditional curriculum. Restricted to majors. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

MUSC 511. Survey of Traditional Harmony**3 Credits (3)**

Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Restricted to: Music majors. Traditional Grading with RR.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 513. Twentieth Century Art Music**3 Credits (3)**

Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school in historical context. Restricted to: Music majors.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 518. Seminar in Music Theory**3 Credits (3)**

Varying topics in Music Theory, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: Music majors. Traditional Grading with RR.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 519. Seminar in Music History**3 Credits (3)**

Varying topics in Music History, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 477.

MUSC 521. Music of the Baroque Era: History and Literature**3 Credits (3)**

An overview of the music of the Baroque Era with an emphasis on history and literature. May be repeated up to 3 credits.

Prerequisite: A grade of B or better in MUSC 477.

Learning Outcomes

1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 522. Music of the Classical Era: History and Literature**3 Credits (3)**

An overview of the music of the Classical era with an emphasis on history and literature. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 477.

MUSC 523. Music of the Romantic Era: History and Literature
3 Credits (3)

An overview of Romantic era music, with an emphasis on history and literature. Restricted to MUS Majors. May be repeated up to 3 credits.

Prerequisite: A grade of B or better in MUSC 477.

Learning Outcomes

1. Develop an in depth knowledge of composers of the Romantic era
2. Develop the ability to Recognize Major compositions of the Romantic Era
3. Develop the ability to analyze works from the Romantic Era.

MUSC 529. Opera History and Literature
3 Credits (3)

An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: M ED, MUS majors.

Prerequisite(s): A grade of B or better in MUSC 477.

Learning Outcomes

1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 530. Seminar in Music Education
3 Credits (3)

Varying topics in Music Education, providing a more specific and in-depth study of the particular topic. Restricted to: MUS majors.

MUSC 531. Music Education in the Diverse Classroom
3 Credits (3)

This course is designed to provide an introduction to diverse and at-risk student groups in educational settings in the music classroom. It will help the course participants explore strategies and gain skills to enhance the musical growth of marginalized groups of students. There is an emphasis on identification, behavioral patterns, building interpersonal relationships, and will include a critical review of selected current research studies in music education. Armed with this knowledge, course participants will be better prepared to understand at-risk students and how best to implement strategies in the classroom. May be repeated up to 3 credits. Restricted to: MUS majors.

Learning Outcomes

1. Students will access and utilize the basic research journals and other sources of research reports and summaries, including those identified using computer technology in the field of music education.
2. Students will describe the structure of most qualitative research studies and their aide in identifying student traits.
3. Students will understand and use most of the language, terms and vocabulary found in qualitative research reports in discussing and identifying behavioral patterns of at-risk students.
4. Students will appraise qualitative research in a systematic way; analyze and review what the research produced in order to isolate the strategies available to incorporate in classroom teaching scenarios.
5. Students will independently retrieve, critique and summarize research related to at-risk students in music education.

MUSC 535. Current Issues in Music Education
3 Credits (3)

This course examines the rich and challenging complexities of music teaching and learning from a variety of perspectives. Educational theory to pedagogical inquiry of current educational practice will be examined, calling students to critically reflect on such professional activities as lesson planning, curriculum design, repertoire choice, program assessment, advocacy in the arts, and student evaluation. Restricted to: MUS (Music Ed track only) majors.

MUSC 540. Graduate Recital/Analytical Paper
4 Credits (4)

This course is for students completing a Master of Music with a Performance emphasis. A public recital will be given and an accompanying research paper will be submitted. Restricted to: MUS majors.

MUSC 574. Advanced Choral Conducting I
3 Credits (3)

This course will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 575. Advanced Choral Conducting II
3 Credits (3)

This is the final course in preparation for the student's graduate conducting concert. It will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 574.

MUSC 576. Advanced Instrumental Conducting I
3 Credits (3)

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 577. Advanced Instrumental Conducting II
3 Credits (3)

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 576.

MUSC 578. Advanced Choral Literature**2-3 Credits (2-3)**

An examination of significant choral works from 1200 to the present, including composers, genres, and historical context May be repeated up to 3 credits. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 579. Advanced Instrumental Literature**2-3 Credits (2-3)**

An examination of significant instrumental works from the Baroque period to the present, including composers, genres, and historical context May be repeated up to 3 credits. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 580. Ensemble Performance**1 Credit (1)**

Performance in university ensembles. May be repeated up to 99 credits.

Prerequisite(s): by audition only.

MUSC 582. Applied Music**2-4 Credits (2-4)**

For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. Students must audition in order to enroll. Consent of instructor required. May be repeated up to 24 credits.

Learning Outcomes

1. Develop of Musical Performance Attributes.
2. Development of technical Skills.
3. Development of Aural Skills.
4. Development of Musical Analytical Skills.
5. Development of Improvisatory Skills.

MUSC 586. Applied Music Pedagogy and Literature III**2 Credits (2)**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 486.

MUSC 598. Special Research Programs**1-4 Credits**

May be taken for unlimited credit.

MUSC 599. Master's Thesis**15 Credits**

Thesis.

Phone: (575) 646-2421

Website: <http://music.nmsu.edu/> (<http://music.nmsu.edu>)

Music - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students that wish to pursue this degree would be best served in completing this program as an accompanying degree or double major to an already existing program, completing this program with one of the

concentrations, or students judiciously select a minor to accompany the BA in Music

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
	English Composition - Level 1 (4 credits) ¹	
	English Composition - Level 2 (3 credits) ¹	
	Oral Communication (3 credits) ¹	
<i>Area II: Mathematics</i> ¹		3-4
<i>Area III/IV: Laboratory Sciences and Social Behavioral Sciences</i> ¹		10-11
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfillment of Area III, not required))	
Area IV: Social Behavioral Sciences Course (3 credits) ¹		
Either an Area III or IV: Laboratory Sciences or Social/Behavioral Sciences Course (3-4 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing a Wider World ²		6
Departmental Requirements		
<i>Theory and Ear Training Courses</i>		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
<i>History and Literature Courses</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
<i>Techniques Courses</i>		2
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
<i>Performance Courses</i>		
Any 2000 level MUSC ensemble ³		3
MUSC 2510	Applied Music I ⁴	4
MUSC 330	Applied Music II ⁵	2
Any 300 level MUSC Ensemble ³		3
MUSC 1310	Recital Attendance (4 semesters with .5 credits each)	2
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
<i>Departmental Electives</i>		
Any 300 level MUSC Electives		6
Any 400 level MUSC Electives		6
Non-Departmental Requirements		
<i>Minor Field Courses</i>		15
Second Language Requirements (not required) ⁶		0
Electives, to bring the total credits to 120 ⁷		9-13
Total Credits		120

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

³ Students must complete this requirement for 1 credit for a total of 3 semesters.

⁴ Students must complete this requirement for 1 credit for a total of 4 semesters.

⁵ Students must complete this requirement for 1 credit for a total of 2 semesters.

⁶ Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Music there is no second language requirement for the degree.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 1470	Functional Piano I (Fall only)	2
ENGL 1110G	Composition I	4
Area II: Mathematics Course ¹		3-4
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
ENGL 2221G or ENGL 2210G	Writing in the Humanities and Social Science or Professional & Technical Communication	3
COMM 1115G	Introduction to Communication	3
Credits		31-32

Second Year

MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1

MUSC 2310	Sound and Music Technology	1
MUSC 2120	Major Ensemble	1
MUSC 302	Music History and Literature: Classic through Romantic	3
Area IV: Social/Behavioral Science Course ¹		3
MUSC 1310	Recital Attendance	0.5
MUSC 2510	Applied Music I	1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
300-level Major Ensemble Course		1
Minor Field Course		3
Area III: Laboratory Science Course ¹		4
PHYS 1125G	Physics of Music (Suggested)	
Credits		26

Third Year

MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level Major Ensemble Course		1
300-level Music Elective		3
Area IV: Creative and Fine Arts Course ¹		3
Area V: Humanities Course ¹		3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Science Course ¹		3-4
MUSC 330	Applied Music II	1
300-level Major Ensemble Course		1
300-level Music Elective Course		3
Minor Field Course		3
VWW: Viewing a Wider World Course ²		3
Elective Course(s)		5
Credits		31-32

Fourth Year

Elective Course(s)		4
400-level Music Elective Course		3
Minor Field Course		3
Elective Course		3
General Education Elective Course ¹		3
MUSC 341	BA Capstone	1-2
400-level Music Elective Course		3
Minor Field Course(s)		6
Elective Course		3
VWW: Viewing a Wider World Course ²		3
Credits		32-33
Total Credits		120-123

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

Music (Pre-Music Therapy) - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
	English Composition - Level 1 (4 credits) ¹	
	English Composition - Level 2 (3 credits) ¹	
	Oral Communication (3 credits) ¹	
<i>Area II: Mathematics</i> ¹		
MATH 1350G	Introduction to Statistics	3
<i>Area III/IV: Laboratory Sciences and Social Behavioral Sciences</i> ¹		10
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfillment of Area III, not required))	
PSYC 1110G	Introduction to Psychology	
CEPY 1120G	Human Growth and Behavior (recommended) ¹	
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing a Wider World ²		6
Departmental Requirements		
<i>Theory and Ear Training Courses</i>		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
<i>History and Literature Courses</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
<i>Techniques Courses</i>		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
<i>Performance Courses</i>		
MUSC 2510	Applied Music I (4 semesters) ³	4
MUSC 330	Applied Music II ⁴	2
Any 200 level MUSC Ensemble ⁵		3
Any 300 level MUSC Ensemble ⁵		3
MUSC 1310	Recital Attendance (4 semesters) ⁶	2
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
<i>Departmental Electives</i>		
Six credits of any 300-level MUSC Courses		6
Six credits of any 400-level MUSC Courses		6
Non-Departmental Requirements		
<i>Concentration Courses</i>		
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	4
PSYC 302	Abnormal Psychology	3
PSYC 350	Developmental Psychology: Conception through Childhood	3
MATH 1215	Intermediate Algebra	3
Second Language Requirements (not required) ⁷		0

Electives, to bring the total credits to 120 ⁸	15-17
Total Credits	120

- ¹ See the General Education Section (p. 220) of the catalog for a full list of courses
- ² See the Viewing a World Section (p. 224) of the catalog for a full list of courses
- ³ Students must complete this requirement for 1 credit for a total of 4 semesters.
- ⁴ Students must complete this requirement for 1 credit for a total of 2 semesters.
- ⁵ Students must complete this requirement for 1 credit for a total of 3 semesters.
- ⁶ Students must complete this requirement for .5 credit for a total of 4 semesters.
- ⁷ Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.
- ⁸ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 1470	Functional Piano I (Fall only)	2
ENGL 1110G	Composition I	4
MATH 1215	Intermediate Algebra (required for upper-division Psychology & Mathematics course)	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
Elective Course		2
MUSC 1471	Functional Piano II (suggested)	
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	4

MATH 1350G	Introduction to Statistics	3
Credits		34
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2310	Sound and Music Technology	1
MUSC 2120	Major Ensemble	1
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
MUSC 302	Music History and Literature: Classic through Romantic	3
PSYC 1110G	Introduction to Psychology (meets the Area IV: Requirement)	3
COMM 1115G	Introduction to Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2510	Applied Music I	1
300-level MUSC Major Ensemble Course		1
Elective Course		1-3
MUSC 2452	Ear Training IV (suggested)	
MUSC 2461	Music Theory IV (suggested)	
MUSC 323	Percussion Technique I (strongly suggested)	
Area III: Laboratory Sciences Course ¹		4
PHYS 1125G	Physics of Music (suggested)	
ENGL 2221G	Writing in the Humanities and Social Science	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Credits		30-32
Third Year		
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble Course		1
Elective Course (Upper-Division)		1
Elective Course		1
General Education Elective Course ¹		3
MUSC 322	Guitar Methods (Strongly suggested)	
Area VI: Creative and Fine Arts Course ¹		3
300-level Music Elective		3
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble Course		1
300-level MUSC Elective Course		3
CEPY 1120G	Human Growth and Behavior	3
VWW: Viewing a Wider World ²		3
Credits		25
Fourth Year		
400-level MUSC Elective		3
PSYC 302	Abnormal Psychology	3
Elective Course(s)		4
MUSC 1440	Vocal Techniques for Instrumental Music Education Majors (Strongly suggested)	
Area V: Humanities Course ¹		3
Upper-Division Music Course if needed		3
MUSC 341	BA Capstone	1-2
400-level MUSC Elective Course		3
PSYC 350	Developmental Psychology: Conception through Childhood	3
Elective Course (upper-division)		5

VWW: Viewing a Wider World Course ²	3
Credits	31-32
Total Credits	120-123

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

Music (Pre-Speech Language Pathology) - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
English Composition - Level 1 (4 credits) ¹		
English Composition - Level 2 (3 credits) ¹		
Oral Communication (3 credits) ¹		
<i>Area II: Mathematics</i>		
MATH 1350G	Introduction to Statistics (concentration course)	3
<i>Area III/IV: Laboratory Sciences and Social Behavioral Sciences ¹</i>		
PHYS 1125G	Physics of Music (suggested fulfilment of Area III, not required)	4
PSYC 1110G	Introduction to Psychology	3
LING 2110G	Introduction to the Study of Language and Linguistics (concentration course)	3
<i>Area V: Humanities ¹</i>		<i>3</i>
<i>Area VI: Creative and Fine Arts ¹</i>		<i>3</i>
<i>General Education Elective</i>		<i>3</i>
CEPY 1120G	Human Growth and Behavior (recommended)	
Viewing a Wider World ²		6
Departmental Requirements		
<i>Theory and Ear Training Courses</i>		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
<i>History and Literature Courses</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
<i>Techniques Courses</i>		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1

<i>Performance Courses</i>		
MUSC 2510	Applied Music I ³	4
MUSC 330	Applied Music II ⁴	2
Any 200 level MUSC Ensemble ⁵		3
Any 300 level MUSC Ensemble ⁵		3
MUSC 1310	Recital Attendance ⁶	4
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
<i>Departmental/College Electives</i>		
Six credits of any 300-level MUSC Courses		6
Six credits of any 400-level MUSC Courses		6
Non-Departmental Requirements		
<i>Concentration Courses</i>		
MATH 1215	Intermediate Algebra	3
SPHS 2110	Introduction to Communication Disorders	3
SPHS 4610	Language Acquisition	3
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	3
SPHS 4510	Phonetics	3
SPHS 4620	Speech and Hearing Science	3
Second Language Requirements (not required) ⁷		0
Electives, to bring the total credits to 120 ⁸		9-10
Total Credits		120

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

³ Students must complete this requirement for 1 credit for a total of 4 semesters.

⁴ Students must complete this requirement for 1 credit for a total of 2 semesters.

⁵ Students must complete this requirement for 1 credit for a total of 3 semesters.

⁶ Students must complete this requirement for .5 credit for a total of 4 semesters.

⁷ Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.

⁸ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G	Composition I	4
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 1470	Functional Piano I (Fall only)	2
MATH 1215	Intermediate Algebra (required for upper division Psychology & Mathematics course)	3
SPHS 2110	Introduction to Communication Disorders	3
ENGL 2221G or ENGL 2210G	Writing in the Humanities and Social Science or Professional & Technical Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
CEPY 1120G	Human Growth and Behavior (Meets the General Education Elective requirement)	3
LING 2110G	Introduction to the Study of Language and Linguistics (Meets the Area IV requirement)	3
Credits		37

Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
MUSC 2310	Sound and Music Technology	1
2000-level MUSC Ensemble Course		1
SPHS 4510	Phonetics	3
MUSC 302	Music History and Literature: Classic through Romantic	3
COMM 1115G	Introduction to Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2510	Applied Music I	1
300-level MUSC Major Ensemble Course		1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MATH 1350G	Introduction to Statistics	3
Area III: Laboratory Science Course ¹		4
PHYS 1125G	Physics of Music (suggested)	
Credits		29

Third Year		
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level MUSC Major Elective Course		1
300-level MUSC Ensemble Course		1
Area V: Humanities Course ¹		3
Elective Course		3
SPHS 4520	Audiology (Strongly recommended, prerequisite for SPHS 4620)	
MUSC 386	Applied Music Pedagogy and Literature I (Vocal Ped & Lit suggested Upper-division MUSC Elective)	2
MUSC 330	Applied Music II	1

300-level Music Elective Course	4
300-level MUSC Major Ensemble Course	1
VWW: Viewing a Wider World Course ²	3
SPHS 4610 Language Acquisition	3
SPHS 4620 Speech and Hearing Science	3
PSYC 1110G Introduction to Psychology	3
Credits	30
Fourth Year	
Area VI: Creative and Fine Arts Course ¹	3
400-level MUSC Music Elective	3
Elective Course	2
MUSC 1440 Vocal Techniques for Instrumental Music Education Majors (suggested)	
Elective Course	3
SPHS 4710 Speech Disorders Across the Lifespan (Strongly suggested prerequisite to SPHS4820/SPHS 4830)	
SPHS 4720 Anatomy and Physiology of Speech Mechanisms	3
VWW: Viewing a Wider World Course ²	3
MUSC 341 BA Capstone	1-2
400-level MUSC Elective Course	3
Elective Course	3
SPHS 4810 Clinical Methods and Procedures (suggested)	
SPHS 4820 Neural Bases of Communication Disorders (suggested)	
SPHS 4830 Aural Rehabilitation (suggested)	
Credits	24-25
Total Credits	120-121

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

Music (Theatre) - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
English Composition - Level 1 (4 credits) ¹		
English Composition - Level 2 (3 credits) ¹		
Oral Communication (3 credits) ¹		
<i>Area II: Mathematics</i> ¹		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>10-11</i>
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences (3 credits)		
Either an Area III or IV: Laboratory Sciences or Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities</i> ¹		<i>3</i>

<i>Area VI: Creative and Fine Arts</i> ¹		<i>3</i>
<i>General Education Elective</i>		
This requirement is satisfied by the 9-credit rule with the THEA 1000 level courses required for the Concentration		
Viewing a Wider World ²		6
Departmental Requirements		
<i>Theory and Ear Training Courses</i>		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
<i>History and Literature Courses</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
<i>Techniques Courses</i>		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
<i>Performance Courses</i>		
MUSC 1310	Recital Attendance ³	2
MUSC 2510	Applied Music I ⁴	4
MUSC 330	Applied Music II ⁵	2
Any 200 Level MUSC Ensemble ⁶		3
Any 300 level MUSC Ensemble ⁶		3
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
<i>Departmental Electives</i>		
Six credits of 300-level MUSC Elective courses		6
Six credits of 400 level MUSC courses		6
Non-Departmental Requirements (other than Gen.Ed/WW)		
<i>Concentration Courses</i>		
THEA 1223	The Art of Theatre	3
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 2421	Vocal Production for the Actor	3
THEA 317	Musical Theatre	3
THEA 356	Theatre Production (May substitute MUSC 351) ⁷	2
THEA 417	Musical Theatre II	3
THEA 395	Directing I	3
DANC 2460	Dance for Musical Theatre	2
Second Language Requirements (not required) ⁸		0
Electives, to bring the total credits to 120 ⁹		5-8
Total Credits		120

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

³ Students will complete the requirements with .5 credit for 4 semesters

⁴ Students will complete the requirements with 1 credit for 4 semesters

⁵ Students will complete the requirements with 1 credit for 2 semesters

⁶ Students will complete the requirements with 1 credit for 3 semesters

- ⁷ Students will complete the requirements with 1 credit for 2 semesters
- ⁸ Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.
- ⁹ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Music with a concentration in Theatre there is no second language requirement for the degree.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G	Composition I	4
MATH 1130G	Survey of Mathematics	3
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 1470	Functional Piano I	2
THEA 1223	The Art of Theatre	3
ENGL 2221G or ENGL 2210G	Writing in the Humanities and Social Science or Professional & Technical Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
Area IV: Social/Behavioral Sciences Course ¹		3
Elective Course		2
MUSC 1471	Functional Piano II (suggested)	
Credits		36
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2310	Sound and Music Technology	1
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1

MUSC 302	Music History and Literature: Classic through Romantic	3
THEA 1221	Beginning Acting	3
COMM 1115G	Introduction to Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2510	Applied Music I	1
Elective Course		1-3
MUSC 2452	Ear Training IV (suggested)	
MUSC 2461	Music Theory IV (suggested)	
MUSC 303	Music History and Literature: 20th Century Through the Present	3
THEA 1222	Stage Movement	3
Area III: Laboratory Sciences Course		4
PHYS 1125G	Physics of Music	
Credits		29-31

Third Year		
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble		1
300-level MUSC Music Elective		3
THEA 2421	Vocal Production for the Actor	3
THEA 317	Musical Theatre	3
DANC 2460	Dance for Musical Theatre	2
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble		1
300-level Music Elective		3
MUSC 351 or THEA 356	Opera Workshop or Theatre Production	1
THEA 417	Musical Theatre II	3
VWW: Viewing a Wider World Course ²		3
Area VI: Creative and Fine Arts Course ¹		3
Elective Course		2
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course ¹		3-4
Credits		34-35

Fourth Year		
300-level MUSC Major Ensemble		1
400-level MUSC Music Elective		3
MUSC 351 or THEA 356	Opera Workshop or Theatre Production	1
THEA 395	Directing I	3
Theatre History Elective recommended (upper-division)		
Area V: Humanities Course ¹		3
MUSC 341	BA Capstone	1-2
400-level MUSC Music Elective		3
Elective Course (Upper-Division)		3
Theatre History Elective recommended		
VWW: Viewing a Wider World Course ²		3
Credits		21-22
Total Credits		120-124

¹ See the General Education Section (p. 220) of the catalog for a full list of courses

² See the Viewing a World Section (p. 224) of the catalog for a full list of courses

Music (Instrumental Performance) - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

Requirements - Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
General Education Elective ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Music Theory and Ear Training</i>		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2452	Ear Training IV	1
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
<i>History and Literature</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Choose two 400-level music history course from the following:		6
MUSC 421	Music of the Baroque Era	
MUSC 422	Music of the Classic Era	
MUSC 424	Music of the Twentieth Century	

MUSC 429	Opera: History and Literature	
<i>Techniques</i>		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 326	Instrumental Conducting	3
or MUSC 327	Choral Conducting	
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 415	Orchestration	3
MUSC 441	Supervised Studio Teaching	2
<i>Performance</i>		
MUSC 1310	Recital Attendance (take for eight semesters for a total of 4 credits)	4
<i>Applied Music</i>		20
MUSC 2510	Applied Music I (Instrumental)	
MUSC 330	Applied Music II (Instrumental)	
MUSC 430	Applied Music III (Instrumental) ⁴	
MUSC 340	Junior Recital	1
MUSC 440	Senior Recital ⁵	2
Applied or Functional Piano		4
Instrumental Ensemble		12
Second Language Requirement: (not required)		
Electives, to bring the total credits to 127		0
Total Credits		127-130

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses.
- ² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.
- ³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁴ All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.
- ⁵ Music Performance students must take MUSC 440 Senior Recital for 2 credits.

Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Instrumental Performance, there is no second language requirement for the degree.

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until the Proficiency is passed

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I (Fall only)	3

MUSC 1470	Functional Piano I (Fall Only) ¹	2
MUSC 2120	Major Ensemble	1
MUSC 2510	Applied Music I	2
ENGL 1110G	Composition I ²	4
MATH 1130G	Survey of Mathematics ²	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II (Spring only)	1
MUSC 1461	Music Theory II (Spring only)	3
MUSC 1471	Functional Piano II (Spring only) ¹	2
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2510	Applied Music I	2
2000-level Instrument Ensemble Course		1
ENGL 2210G or ENGL 2221G	Professional & Technical Communication ² or Writing in the Humanities and Social Science	3

Credits **32**

Second Year

MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall only)	1
MUSC 2460	Music Theory III (Fall only)	3
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	2
MUSC 302	Music History and Literature: Classic through Romantic	3
300-Level Instrument Ensemble Course		1
COMM 1115G	Introduction to Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2452	Ear Training IV (Spring only)	1
MUSC 2461	Music Theory IV (Spring only)	3
MUSC 2510	Applied Music I	2
MUSC 303	Music History and Literature: 20th Century Through the Present	3
300-level Instrument Ensemble Course		1
Area III: Laboratory Science Course ³		4
PHYS 1125G	Physics of Music (Suggested)	

Credits **29**

Third Year

MUSC 1310	Recital Attendance	0.5
MUSC 325	Beginning Conducting ²	1
MUSC 330	Applied Music II ²	3
MUSC 386	Applied Music Pedagogy and Literature I	2
300-level Instrument Ensemble Course(s)		2
Area VI: Creative and Fine Arts Course ³		3
General Education Elective Course ³		3
Area IV: Social/Behavioral Sciences Course ³		3
MUSC 1310	Recital Attendance	0.5
MUSC 326 or MUSC 327	Instrumental Conducting (Spring only) or Choral Conducting	3
MUSC 330	Applied Music II	3
MUSC 340	Junior Recital	1
300-level Instrument Ensemble Course(s)		2
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course ³		3-4
Area V: Humanities Course ³		3

Credits **33-34**

Fourth Year

MUSC 1310	Recital Attendance	0.5
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MUSC 413	Form and Analysis (Fall only)	3
MUSC 430	Applied Music III (Fall only)	3
MUSC 441	Supervised Studio Teaching	2
300-level Instrument Ensemble Course(s)		2
Music History Elective (400-level)		3
VWW: Viewing a Wider World Course(s) ⁴		6
MUSC 1310	Recital Attendance	0.5
MUSC 415	Orchestration ²	3
MUSC 430	Applied Music III ²	3
MUSC 440	Senior Recital	2
300-level Instrument Ensemble Course(s)		2
400-level Music History Elective Course		3
Credits		33
Total Credits		127-128

¹ Functional Piano is not a required course. It is recommended that students take it at the appropriate level until ready to pass the required Piano Proficiency

² These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Music (Piano Performance) - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

Requirements - Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 127 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfillment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		

<i>Area V: Humanities</i> ¹	3
<i>Area VI: Creative and Fine Arts</i> ¹	3
<i>General Education Elective</i> ¹	3-4
Viewing A Wider World ³	6
Departmental/College Requirements	
<i>Music Theory and Ear Training</i>	
MUSC 1450 Ear Training I	1
MUSC 1460 Music Theory I	3
MUSC 2451 Ear Training III	1
MUSC 2460 Music Theory III	3
MUSC 1451 Ear Training II	1
MUSC 1461 Music Theory II	3
MUSC 2452 Ear Training IV	1
MUSC 2461 Music Theory IV	3
MUSC 413 Form and Analysis	3
<i>History and Literature</i>	
MUSC 2240 Music History and Literature: Antiquity through Baroque	3
MUSC 302 Music History and Literature: Classic through Romantic	3
MUSC 303 Music History and Literature: 20th Century Through the Present	3
Choose two 400-level music history course from the following:	6
MUSC 421 Music of the Baroque Era	
MUSC 422 Music of the Classic Era	
MUSC 424 Music of the Twentieth Century	
MUSC 429 Opera: History and Literature	
<i>Techniques</i>	
MUSC 2310 Sound and Music Technology	1
MUSC 325 Beginning Conducting	1
MUSC 386 Applied Music Pedagogy and Literature I	2
MUSC 486 Applied Music Pedagogy and Literature II	2
<i>Performance</i>	
MUSC 1310 Recital Attendance (take eight semesters for a total of 4 credits)	4
MUSC 2110 Chamber Ensemble (take two semesters for a total of 2 credits)	2
<i>Applied Music</i>	
MUSC 2510 Applied Music I (Piano)	
MUSC 330 Applied Music II (Piano)	
MUSC 430 Applied Music III (Piano) ⁴	
MUSC 340 Junior Recital	1
MUSC 350 Chamber Music (take two semesters for a total of 2 credits)	2
MUSC 417 Studio Accompanying (take two semesters for a total of 4 credits)	4
MUSC 440 Senior Recital ⁵	2
Ensemble	4
Secondary Applied	4
Upper Level Music Electives	4
Second Language Requirement: (not required)	
Electives, to bring the total credits to 125	0
Total Credits	125-128

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

⁵ Music Performance students must take MUSC 440 Senior Recital for 2 credits.

Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Piano Performance, there is no second language requirement for the degree.

Secondary Proficiency

- Students must pass Secondary Proficiency before presenting a Senior Recital.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 1450	Ear Training I (Fall Only; C- or better) ¹	1
MUSC 1460	Music Theory I (Fall only; C- or better) ¹	3
MUSC 2510	Applied Music I (C- or better)	2
Secondary Applied Music Course (C- or better)		2
2000-level Ensemble Course (C- or better)		1
ENGL 1110G	Composition I (C- or better) ¹	4
MATH 1130G	Survey of Mathematics (C- or better) ¹	3
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 1451	Ear Training II (Spring only; C- or better) ¹	1
MUSC 1461	Music Theory II (Spring only; C- or better) ¹	3
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	2
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
Secondary Applied Music Course (C- or better) ¹		2
2000-level Ensemble Course (C- or better)		1
ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
Credits		33
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall only; C- or better) ¹	1
MUSC 2460	Music Theory III (Fall only; C- or better) ¹	3
MUSC 2510	Applied Music I	2
MUSC 302	Music History and Literature: Classic through Romantic	3
300-level Music Ensemble Course (C- or better)		1
COMM 1115G	Introduction to Communication (C- or better)	3
Area IV: Social/Behavioral Science Course ²		3
MUSC 1310	Recital Attendance	0.5
MUSC 2452	Ear Training IV (Spring only; C- or better) ¹	1
MUSC 2461	Music Theory IV (Spring only; C- or better) ¹	3

MUSC 2510	Applied Music I	2
300-level Music Ensemble Course (C- or better)		1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Area V: Humanities Course ²		3
Area III: Laboratory Sciences Course		4
PHYS 1125G	Physics of Music (Suggested)	
Credits		34
Third Year		
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 325	Beginning Conducting (C- or better) ¹	1
MUSC 330	Applied Music II (C- or better) ¹	3
MUSC 386	Applied Music Pedagogy and Literature I (C- or better)	2
MUSC 2110	Chamber Ensemble	1
Area VI: Creative and Fine Arts Course (C- or better) ⁶		3
An either Area III: Laboratory Science or Area IV: Social/Behavioral Sciences Course		3-4
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 330	Applied Music II (C- or better) ¹	3
MUSC 340	Junior Recital (C- or better) ¹	1
MUSC 2110	Chamber Ensemble (C- or better)	1
Upper-level Music Elective Course (C- or better)		2
General Education Elective Course ⁶		3
Music History 400-level Course		3
Credits		27-28
Fourth Year		
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 413	Form and Analysis (Fall only; C- or better) ¹	3
MUSC 430	Applied Music III (C- or better) ¹	3
MUSC 486	Applied Music Pedagogy and Literature II (C- or better)	2
MUSC 350	Chamber Music (C- or better)	1
MUSC 417	Studio Accompanying (C- or better)	2
VWW: Viewing a Wider World Courses (C- or better) ³		6
MUSC 1310	Recital Attendance (S/U Grading)	0.5
MUSC 350	Chamber Music (By audition only; C- or better)	1
MUSC 417	Studio Accompanying (C- or better)	2
MUSC 430	Applied Music III (C- or better)	3
MUSC 440	Senior Recital (C- or better) ¹	2
400-level Music History Elective Course (C- or better) ¹		3
Upper-level Music Elective Course (C- or better)		2
Credits		31
Total Credits		125-126

¹ Students are responsible for understanding and enrolling in any co-requisite courses and completing any prerequisites prior to enrolling in this course.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section for a full list of courses.

Music (Vocal Performance) - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a

foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

Requirements - Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
Area II: Mathematics ^{1, 2}		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Music Theory and Ear Training</i>		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2452	Ear Training IV	1
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
<i>History and Literature</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 429	Opera: History and Literature	3
<i>Techniques</i>		
MUSC 2210	Diction I	2
MUSC 2220	Diction II	2
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 486	Applied Music Pedagogy and Literature II	2
<i>Performance</i>		

MUSC 1310	Recital Attendance (take for eight semesters for a total of 4 credits)	4
Applied Music		19
MUSC 2510	Applied Music I (Vocal)	
MUSC 330	Applied Music II (Vocal)	
MUSC 430	Applied Music III (Vocal) ⁴	
MUSC 340	Junior Recital	1
MUSC 440	Senior Recital ⁵	2
Choral Ensembles		6
Opera Ensembles		6
Applied or Functional Piano		4
Second Language Requirement: (required - see below)		8
Electives, to bring the total credits to 129		0
Total Credits		129-132

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

⁵ Music Performance students must take MUSC 440 Senior Recital for 2 credits.

Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Vocal Performance the student must do the following:

Prefix	Title	Credits
FREN 1110	French I	8
& GRMN 1110	and German I	
or a high school equivalent		

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until the Proficiency is passed.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 1470	Functional Piano I ¹	2
MUSC 2210	Diction I (Fall only; odd academic year only)	2
MUSC 2510	Applied Music I	2
2000-level Choral Ensemble Course		1
ENGL 1110G	Composition I ²	4

MATH 1130G	Survey of Mathematics ²	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II (Spring only)	1
MUSC 1461	Music Theory II (Spring only)	3
MUSC 1471	Functional Piano II ¹	2
MUSC 2510	Applied Music I	2
MUSC 2220	Diction II (Spring only)	2
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
2000-level Choral Ensemble Course		1
ENGL 2221G	Writing in the Humanities and Social Science ²	3
or ENGL 2210G	or Professional & Technical Communication	
Credits		36

Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall only) ²	1
MUSC 2460	Music Theory III (Fall only) ²	3
MUSC 2510	Applied Music I (Choral Ensemble Course)	2
MUSC 2993	Opera Workshop	1
MUSC 2310	Sound and Music Technology ²	1
Choral Ensemble Course		1
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 386	Applied Music Pedagogy and Literature I (Fall only; even academic year only)	2
MUSC 1310	Recital Attendance ²	0.5
MUSC 2452	Ear Training IV (Spring only)	1
MUSC 2461	Music Theory IV (Spring only)	3
MUSC 2993	Opera Workshop	1
MUSC 2510	Applied Music I	2
2000-level Choral Ensemble Course		1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Area III: Laboratory Sciences Course ³		4
PHYS 1125G	Physics of Music (Suggested)	
Credits		30

Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 325	Beginning Conducting ¹	1
MUSC 330	Applied Music II ¹	2
MUSC 351	Opera Workshop	1
300-level Choral Ensemble Course		1
MUSC 486	Applied Music Pedagogy and Literature II (Fall only; odd academic year only)	2
Area IV: Social/Behavioral Sciences Course ³		3
COMM 1115G	Introduction to Communication	3
Area VI: Creative and Fine Arts Course ^{4,5}		3
MUSC 1310	Recital Attendance	0.5
MUSC 330	Applied Music II	2
MUSC 340	Junior Recital	1
MUSC 351	Opera Workshop	1
300-level Choral Ensemble Course		1
GRMN 1110	German I	4
Area V: Humanities Course ³		3
General Education Elective Course ^{3,5}		3
Credits		32

Fourth Year

MUSC 1310	Recital Attendance	0.5
MUSC 351	Opera Workshop	1
MUSC 413	Form and Analysis (Fall only) ²	3
MUSC 429	Opera: History and Literature (Fall only; even year only)	3
MUSC 430	Applied Music III ²	2
FREN 1110	French I	4
VWW: Viewing a Wider World Course(s) ⁴		6
MUSC 1310	Recital Attendance	0.5
MUSC 415	Orchestration	3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course ³		3-4
MUSC 430	Applied Music III ²	2
MUSC 440	Senior Recital ²	2
MUSC 351	Opera Workshop	1
Credits		31-32
Total Credits		129-130

¹ Functional Piano is not a required course. It is recommended that students take it at the appropriate level until ready to pass the required Piano Proficiency

² These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ It is possible to use the nine credit rule to satisfy this requirement.

Music Education (K12 Instrumental) - Bachelor of Music Education

The Bachelor of Music Education (BME) is a diversified four- to five-year degree program of teaching, performance, and specialized studies in music. The goal of this degree is to prepare the student for certification to teach music in the public schools, and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., M.M.E., D.M.A. or Ph.D in music education.

Requirements: Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 133.5 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>10-11</i>

PHYS 1125G	Physics of Music (suggested fulfilment of Area III, not required)	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Music Theory and Ear Training</i>		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 2451	Ear Training III	1
MUSC 2452	Ear Training IV	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 413	Form and Analysis	3
MUSC 2460	Music Theory III	3
MUSC 2461	Music Theory IV	3
<i>History and Literature</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
<i>Techniques</i>		
MUSC 1440	Vocal Techniques for Instrumental Music Education Majors	1
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 326	Instrumental Conducting	3
MUSC 415	Orchestration	3
Select six instrumental tech courses from the following:		6
MUSC 315	Brass Techniques I	
MUSC 316	Brass Techniques II	
MUSC 317	Woodwind Techniques I	
MUSC 318	Woodwind Techniques II	
MUSC 319	String Techniques I	
MUSC 320	String Technique II	
MUSC 322	Guitar Methods	
MUSC 323	Percussion Technique I	
MUSC 324	Percussion Technique II	
<i>Performance</i>		
MUSC 1310	Recital Attendance (take seven semesters for a total of 3.5 credits)	3.5
MUSC 2130	Jazz Ensemble ((not required for string students))	1
or MUSC 363	Jazz Ensembles II	
MUSC 372	Marching Band II (student must enroll for two semesters (not required for string students)) ⁴	2
<i>Applied Music</i>		<i>9</i>
MUSC 2510	Applied Music I (Instrumental)	
MUSC 330	Applied Music II (Instrumental)	
MUSC 430	Applied Music III (Instrumental) ⁵	
MUSC 440	Senior Recital	1-2
Instrumental Ensemble		4

Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Professional Education Courses</i>		
CEPY 2110	Learning in the Classroom	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
MUSC 1410	Introduction to Music Education	2
MUSC 346	Elementary Music Methods	2
MUSC 393	Instructional Strategies I for Instrumentalists	2
MUSC 394	Instructional Strategies II for Instrumentalists	2
MUSC 397	Administrative Music Methods	1
READ 4330	Content Area Literacy	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 131.5		0
Total Credits		131.5-135.5

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ String students may substitute MUSC 2110, MUSC 350 or MUSC 362 for MUSC 372 Marching Band II.

⁵ All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

Second Language Requirement

For the Bachelor of Music Education in Music Education with a Concentration in K-12: Instrumental, there is no second language requirement for the degree.

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until Proficiency is passed.

Music Education Requirement

- Students must pass the TEP Exam before taking MUSC 346 Elementary Music Methods or MUSC 393 Instructional Strategies I for Instrumentalists
- Students must present Senior Recital before student teaching.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Functional Piano is not a required course. Though not listed under recommended coursework each term, it is recommended that students take it at the appropriate level each semester until ready to pass the required Piano Proficiency.

First Year		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
MUSC 1310	Recital Attendance	0.5
MUSC 1440	Vocal Techniques for Instrumental Music Education Majors (Fall only) ¹	1
MUSC 1450	Ear Training I (Fall only) ¹	1
MUSC 1460	Music Theory I (Fall only) ¹	3
MUSC 2510	Applied Music I	1
MUSC 372	Marching Band II (Marching Band I will also fulfill this requirement)	1
MUSC 1310	Recital Attendance	0.5
MUSC 1410	Introduction to Music Education	2
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	1
2000-level Instrumental Ensemble Course		1
ENGL 2210G	Professional & Technical Communication ¹	3
or ENGL 2221G	or Writing in the Humanities and Social Science	
Credits		30
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall Only)	1
MUSC 2460	Music Theory III (Fall Only) ¹	3
Four Instrumental Tech Courses		4
MUSC 2510	Applied Music I	1
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 372	Marching Band II	1
CEPY 2110	Learning in the Classroom	3
COMM 1115G	Introduction to Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2452	Ear Training IV (Spring only) ¹	1
MUSC 2461	Music Theory IV (Spring only) ¹	3
MUSC 2510	Applied Music I	1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
2000-level Instrumental Ensemble Course		1
Area V: Humanities Course ²		3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course ²		3-4
Credits		35-36
Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 325	Beginning Conducting ¹	1
MUSC 330	Applied Music II ¹	1
MUSC 346	Elementary Music Methods	2
MUSC 413	Form and Analysis	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
300-level Instrument Ensemble Course		1
General Education Elective Course ^{2,6}		3
Instrumental Tech Courses		2
Area IV: Social/Behavioral Science Course ²		3

MUSC 1310	Recital Attendance	0.5
MUSC 326	Instrumental Conducting (Spring Only) ¹	3
MUSC 393	Instructional Strategies I for Instrumentalists	2
MUSC 430	Applied Music III ¹	2
MUSC 415	Orchestration	3
300-level Instrument Ensemble Course		1
Area III: Laboratory Science Course ¹		4
PHYS 1125G	Physics of Music (Suggested)	
Credits		35
Fourth Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2130 or MUSC 363	Jazz Ensemble (not required for string students) or Jazz Ensembles II	1
MUSC 394	Instructional Strategies II for Instrumentalists	2
MUSC 397	Administrative Music Methods	1
MUSC 430	Applied Music III ¹	2
MUSC 440	Senior Recital	1-2
READ 4330	Content Area Literacy	3
VWW - Viewing a Wider World Course(s) ³		6
Area VI: Creative and Fine Arts Course ⁶		3
EDUC 4820	Secondary Student Teaching (taken in last semester)	9
EDUC 4821	Middle and High School Student Teaching Seminar (taken in last semester)	3
Credits		31.5-32.5
Total Credits		131.5-133.5

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁶ May use the nine-credit rule to fulfill this requirement

Music Education (K12 Vocal) - Bachelor of Music Education

The Bachelor of Music Education (BME) is a diversified four- to five-year degree program of teaching, performance, and specialized studies in music. The goal of this degree is to prepare the student for certification to teach music in the public schools, and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., M.M.E., D.M.A. or Ph.D in music education.

Requirements: Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 135.5 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i> ^{1,2}		3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfillment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Music Theory and Ear Training</i>		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 2451	Ear Training III	1
MUSC 2452	Ear Training IV	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2460	Music Theory III	3
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
<i>History and Literature</i>		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
<i>Techniques</i>		
MUSC 2210	Diction I	2
MUSC 2220	Diction II	2
MUSC 2310	Sound and Music Technology	1
MUSC 321	Instrumental Techniques for Vocal Music Education Majors	2
MUSC 325	Beginning Conducting	1
MUSC 327	Choral Conducting	3
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 415	Orchestration	3
<i>Performance</i>		
MUSC 1310	Recital Attendance (take seven semesters for a total of 3.5 credits)	3.5
<i>Applied Music</i>		9
MUSC 2510	Applied Music I (Vocal)	
MUSC 330	Applied Music II (Vocal)	
MUSC 430	Applied Music III (Vocal) ⁴	
MUSC 440	Senior Recital	1-2
Vocal Ensemble		7
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Professional Education Courses</i>		
CEPY 2110	Learning in the Classroom	3
EDUC 4820	Secondary Student Teaching	9

EDUC 4821	Middle and High School Student Teaching Seminar	3
MUSC 1410	Introduction to Music Education	2
MUSC 346	Elementary Music Methods	2
MUSC 395	Instructional Strategies I for Vocalists	2
MUSC 396	Instructional Strategies II for Vocalists	2
MUSC 397	Administrative Music Methods	1
READ 4330	Content Area Literacy	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 132.5		
Total Credits		132.5-136.5

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

Second Language Requirement

For the Bachelor of Music Education in Music Education with a Concentration in K-12: Vocal, there is no second language requirement for the degree.

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until Proficiency is passed.

Music Education Requirement

- Students must pass the TEP Exam before taking MUSC 346 Elementary Music Methods or MUSC 395 Instructional Strategies I for Vocalists.
- Students must present Senior Recital before student teaching.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Functional Piano is not a required course. Though not listed under the recommended coursework each term, it is recommended that students continue to take it at the appropriate level until ready to pass the required Piano Proficiency

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 2210	Diction I (Fall Only)	2
MUSC 2510	Applied Music I	1

2000-level Choral Ensemble Course		1
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
MUSC 1310	Recital Attendance	0.5
MUSC 1410	Introduction to Music Education	2
MUSC 1451	Ear Training II (Spring only) ¹	1
MUSC 1461	Music Theory II (Spring only) ¹	3
MUSC 2220	Diction II (Spring only) ¹	2
2000-level Choral Ensemble Course		1
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	1

Credits 30

Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
Choral Ensemble Course		1
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 321	Instrumental Techniques for Vocal Music Education Majors (Fall only, even academic year only)	2
MUSC 386	Applied Music Pedagogy and Literature I (Fall only, even academic year only)	2
COMM 1115G	Introduction to Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2452	Ear Training IV (Spring only) ¹	1
MUSC 2461	Music Theory IV (Spring only) ¹	3
MUSC 2510	Applied Music I	1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
2000-level Choral Ensemble Course		1
Area III: Laboratory Science Course		4
PHYS 1125G	Physics of Music (Suggested)	
CEPY 2110	Learning in the Classroom	3

Credits 33

Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level Choral Ensemble Course		1
MUSC 346	Elementary Music Methods	2
MUSC 413	Form and Analysis ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area IV: Social/Behavioral Sciences Course ²		3
General Education Elective Course ⁶		3
MUSC 1310	Recital Attendance	0.5
MUSC 327	Choral Conducting (Spring only) ¹	3
MUSC 430	Applied Music III	2
300-level Choral Ensemble Course		1
MUSC 395	Instructional Strategies I for Vocalists	2
MUSC 415	Orchestration (Spring only)	3
Area VI: Creative and Fine Arts Course ⁶		3

Either an Area III: Laboratory Sciences Course or Area IV: Social/ Behavioral Sciences Course 3-4

ENGL 2221G Writing in the Humanities and Social Science 3

Credits 38-39

Fourth Year

Semester 2

MUSC 1310 Recital Attendance 0.5

MUSC 396 Instructional Strategies II for Vocalists 2

MUSC 397 Administrative Music Methods 1

MUSC 430 Applied Music III ¹ 2

300-level Choral Ensemble Course 1

MUSC 440 Senior Recital 1

READ 4330 Content Area Literacy 3

VWW: Viewing a Wider World Course(s) ³ 6

Area V: Humanities Course 3

EDUC 4820 Secondary Student Teaching (taken in last semester) 9

EDUC 4821 Middle and High School Student Teaching Seminar (taken in last semester) 3

Credits 31.5

Total Credits 132.5-133.5

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁶ It is possible to complete this requirement through the 9 credit rule.

Music - Undergraduate Minor

A student may not earn both a bachelor's degree in the Department of Music and a minor in Music.

Prefix	Title	Credits
Required Courses		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
Upper division elective credits		9
Applied music		2
Ensemble		2
Total Credits		24

Philosophy

Undergraduate Program Information

A major in philosophy serves not only as preparation for further graduate study in philosophy but also as an area of concentration in a liberal arts program. A philosophy major is appropriate for students planning to attend medical school as well as for those students interested in a career that requires critical reading and argument analysis. Such careers include business, theology and above all, law. For students who are especially

interested in careers in law, politics, or public policy, the Department also offers a major in Justice, Political Philosophy, and Law.

While the course requirements for these majors should meet the ends of the liberal arts student, those students interested in graduate study in philosophy or in a career in law are encouraged to seek advice from a faculty advisor as early in their career as possible.

A minor program in philosophy requiring 18 hours of course work is also offered as well as a minor in Ethics and a minor in Justice, Political Philosophy, and Law. For more information visit the Department of Philosophy's web page at philos.nmsu.edu (<http://philos.nmsu.edu>).

Degrees for the Department

- Justice, Political Philosophy, and Law - Bachelor of Arts (p. 802)
- Philosophy - Bachelor of Arts (p. 804)

Minors for the Department

- Ethics - Undergraduate Minor (p. 806)
- Justice, Political Philosophy, and Law - Undergraduate Minor (p. 806)
- Philosophy - Undergraduate Minor (p. 806)

Timothy Cleveland, Department Head

Professors Cleveland, Walker, Keleher **Associate Professors** Vessel, Klockseim **College Professor** Noonan

Philosophy Courses

PHIL 1115G. Introduction to Philosophy

3 Credits (3)

In this course, students will be introduced to some of the key questions of philosophy through the study of classical and contemporary thinkers. Some of the questions students might consider are: Do we have free will? What is knowledge? What is the mind? What are our moral obligations to others? Students will engage with and learn to critically assess various philosophical approaches to such questions.

Learning Outcomes

1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.

PHIL 1120G. Logic, Reasoning, & Critical Thinking**3 Credits (3)**

The purpose of this course is to teach students how to analyze, critique, and construct arguments. The course includes an introductory survey of important logical concepts and tools needed for argument analysis. These concepts and tools will be used to examine select philosophical and scholarly texts.

Learning Outcomes

1. Comprehend components of arguments.
2. Acquire a general understanding of the essential logical concepts needed for argument analysis, such as validity, soundness, deduction, and induction.
3. Critically assess arguments with an aim toward identifying what constitutes effective and reasonable argument strategies.
4. Learn to identify common logical fallacies.
5. Apply knowledge of argumentation principles to philosophical and scholarly texts

PHIL 1140G. Philosophy and World Religions**3 Credits (3)**

A philosophical enquiry into the religious life; an introduction to philosophical questions about religions focused on consideration of some of the traditional approaches to God and what it means to be religious. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and describe philosophical theories regarding religion.
2. Develop and enhance your critical thinking skills, particularly in the evaluation of arguments about the truth or applicability of particular religious or secular viewpoints.
3. Analyze the teachings of world religions by describing their similarities and differences.
4. Explain the philosophical beliefs, practices, and ethical standards of the major world religions as well as emerging religious movements.
5. Explain how each religion evolved historically, philosophically, and spiritually as well as the contemporary ideas and practices each religion.

PHIL 1145G. Philosophy, Law, and Ethics**3 Credits (3)**

An introduction to practical problems in moral, social, political, and legal philosophy. Topics to be discussed may include ecology, animal rights, pornography, hate speech on campus, same-sex marriage, justice, abortion, terrorism, treatment of illegal immigrants, and New Mexican Aboriginal Peoples' land claims.

Learning Outcomes

1. The aim of this course is to familiarize students with some of the ethical and philosophical issues that arise in connection with laws/legality in general and criminal and constitutional law in the U.S. in particular.
2. It examines issues in moral philosophy, political philosophy, and philosophy of law.
3. A question to which we repeatedly return is whether the law does and/or ought to have some necessary relation to the demands of justice and morality. Among the topics we'll cover are: What is a law? Natural law vs. positive law and legal positivism vs. natural law theory; Utilitarian, divine command, Kantian, and natural law theories of moral rightness/wrongness; The distinction between the normative and the non-normative; Is there a moral duty to obey the law? Plato's Crito and R.P. Wolff's "philosophical anarchism."; J.S. Mill and classical liberalism; Mill's "harm principle" ("the state should restrict the liberty of competent adults via the criminal law only to prevent them from wrongfully harming other persons"); Legal paternalism. Should the state make it harder for citizens to smoke tobacco and/or marijuana, for their own good?; Should voluntary euthanasia be legal? Is there a constitutional "right to die"?; How should judges determine the meaning of vaguely worded constitutional requirements (e.g. "free exercise of religion," no "unreasonable search and seizure," no "cruel and unusual punishment," etc.)? Originalist vs. nonoriginalist approaches; The First Amendment, free speech, and freedom of religion; The death penalty and "cruel and unusual punishment"; The insanity defense in criminal law; Does the 14th Amendment's requirement of "equal protection" under the law compel states to recognize same sex marriage?; The Fourth Amendment and its prohibition of "unreasonable search and seizure."

PHIL 2110G. Introduction to Ethics**3 Credits (3)**

This course introduces students to the philosophical study of morality and will explore questions concerning our human obligations to others and related issues. Students may be asked to relate various approaches to ethics to present-day ethical debates and their own lives.

Learning Outcomes

1. Differential between various ethical theories, which may include virtue ethics, deontology, and consequentialism.
2. Critically evaluate various ethical theories and positions.

PHIL 2230G. Philosophical Thought**3 Credits (3)**

In this course, students will grapple with some of the key questions of philosophy through the study of classical and contemporary thinkers. Students will become familiar with the perennial problems in subfields of philosophy such as metaphysics, epistemology, ethics, and aesthetics. They will learn to approach these problems both critically and sympathetically.

Learning Outcomes

1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.
3. Identify the differences that characterize the major subfields of philosophy.

PHIL 305. Philosophy and Literature**3 Credits (3)**

Examination of philosophical ideas as presented in selected literary works and literary criticism.

PHIL 306. Philosophy Through Film**3 Credits (3)**

An exploration of a range of philosophical issues through the use of film. Topics include personal identity and memory, faith and the problem of evil, free will and moral responsibility, and the meaning of life. Films may include *The Prestige*, *Memento*, *The Third Man*, *A Clockwork Orange*, *Fight Club*, and *Synecdoche, New York*.

PHIL 312. Formal Logic**3 Credits (3)**

Introduction to symbolic logic and its application in the analysis of arguments in scientific and ordinary discourse.

PHIL 315. Philosophy of Language**3 Credits (3)**

A critical examination of philosophical inquiries into the syntactic, semantic, and pragmatic dimensions of language.

PHIL 316. Philosophy of Mathematics**3 Credits (3)**

Survey of traditional philosophical problems and views concerning the nature of mathematics including such questions as: What is the nature of mathematical knowledge? What is mathematical truth? What is a number? What is proof? What is the relationship between logic and mathematics?

PHIL 320. Social and Political Philosophy**3 Credits (3)**

This course critically examines such fundamental concepts as liberty, equality and human rights.

PHIL 322. Environmental Ethics**3 Credits (3)**

Explores the ethical and topical issues raised by mining and grazing, air and water pollution, factory farming, global warming, and treatment of animals. It also studies some recent ecological movements such as ecofeminism, social ecology, and deep ecology.

PHIL 323V. Engineering Ethics**3 Credits (3)**

The moral legal responsibilities of engineers to clients, employers, the public, and the environment. Topics include criteria for judging when risk is acceptable, the duty to safeguard public health and welfare, conflicts of interest, and whistle-blowing.

Prerequisite: Junior standing or higher.

PHIL 328. Applied Ethics**3 Credits (3)**

Examines the implications of utilitarianism, Kantian ethics, natural law theory, and other moral theories for controversial moral issues such as the death penalty, euthanasia, abortion, genetic engineering, gay marriage, affirmative action, and pornography.

PHIL 331. Philosophy of Religion**3 Credits (3)**

The nature, fundamental concepts, and problems of religion. Emphasis on the significance of religion for creative and practical value.

PHIL 332. Ethics and Global Poverty**3 Credits (3)**

Philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

PHIL 341. Ancient Philosophy**3 Credits (3)**

Introduction to the philosophies of the pre-Socratics, Socrates, Plato, Aristotle, with brief discussion of the Epicureans and Stoics.

PHIL 344. Modern Philosophy**3 Credits (3)**

Foundations of contemporary thought: introduction to the philosophies of Descartes, Bacon, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and Hegel.

PHIL 346. Philosophy of Mind**3 Credits (3)**

Examination of some of the most influential accounts of the mind, focusing on such issues as the relation between the mind and the body, mental causation and consciousness.

PHIL 350. Epistemology**3 Credits (3)**

Introduction to epistemology. The philosophical critique of alleged ways of knowing. An examination of the nature of truth.

PHIL 351. Philosophy of Science**3 Credits (3)**

Philosophical examination of the methodology of science. The logical, metaphysical, epistemological, and ethical critique of science and its impact on human affairs.

PHIL 361. Special Topics**3 Credits (3)**

Specific subjects announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

PHIL 363. Independent Studies**1-3 Credits**

For students with some background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHIL 373. Ethical Theory**3 Credits (3)**

The critical examination of the justification of ethical theories with particular attention to the language of moral discourse.

PHIL 376. Philosophy of Law

3 Credits (3)

Ethical, logical, and epistemological implications of law, together with an analysis of the rhetoric of legal practice.

PHIL 380. Metaphysics

3 Credits (3)

Introduction to metaphysics: a treatment of such issues as the meaning of existence, the mind-body problem, the problem of universals, and free will versus determinism.

PHIL 385. Human Nature and the Good Life

3 Credits (3)

An examination of some of the most historically and philosophically influential conceptions of human nature and corresponding accounts of the good life.

PHIL 397. Existentialism

3 Credits (3)

The origins of existentialist thought in philosophy and literature, including the thought of Nietzsche, Kierkegaard, Dostoyevsky, Camus, and Sartre. The course covers topics in ethics and political philosophy, metaphysics, philosophical psychology, philosophy of religion, and other sub-disciplines of philosophy.

PHIL 435. Internship in Philosophy and Law

3 Credits (3)

Supervised hands-on experience for Justice, Political Philosophy, and Law majors to gain professional expertise of the law working with lawyers or judges in law offices, court rooms, and other professional legal settings. Student must be in junior and above standing to enroll. May be repeated up to 6 credits.

Prerequisite: Completion of 12 Philosophy credits; 2.5 GPA;.

Learning Outcomes

1. Demonstrate practical knowledge, analytical ability and critical thinking of professional legal work by becoming familiar with such legal tasks as: preparing pleadings; preparing discovery, responding to discovery; controlling and organizing documents, information; preparing trial notebooks; preparing motions; contacting and responding to clients, witnesses, courts.

PHIL 448. Writing Philosophy

3 Credits (3)

A workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes.

Prerequisite(s): completed 18 hours of philosophy credit.

PHIL 463. Independent Studies

1-3 Credits

For students with a strong background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHIL 505. Advanced Studies in Philosophy and Literature

3 Credits (3)

Examination of philosophical issues (e.g. personal identity, free will, moral dilemmas, the meaning of life) as presented in selected literary works and literary criticism. Consent of Instructor required.

PHIL 532. Advance Studies in Ethics and Global Poverty

3 Credits (3)

Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

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Justice, Political Philosophy, and Law - Bachelor of Arts

The aim of a Justice, Political Philosophy, and Law (JPPL) arts major is to cultivate a reasoned understanding of law and legal institutions, as well as the moral theories that support the value and justice of these institutions. JPPL offers a sequence of courses totaling 36 credit hours in critical thinking, law, policy, global justice, ethical theory, political philosophy, moral theory, feminist philosophy, and human rights. The interdisciplinary component of the major ensures that students have a well-rounded understanding of issues of justice and law. JPPL students will be well-prepared for further studies or careers in law, philosophy, politics, public service, education, human rights, or public policy.

Admission to JPPL is open to any student in good standing in the College of Arts and Sciences.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i> ¹		<i>10-11</i>
Area III: Laboratory Sciences course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Science course (4 credits) or an Area IV: Social/Behavioral Sciences course (3 credits)		
<i>Area V: Humanities</i>		
PHIL 1145G	Philosophy, Law, and Ethics (Introductory Course -Departmental/College Requirement also) ³	3
<i>Area VI: Creative and Fine Arts</i> ¹		<i>3</i>
<i>General Education Elective</i> ¹		

PHIL 2110G	Introduction to Ethics (Introductory Course- Departmental/College Requirement also) ³	3
Viewing a Wider World ⁴		6
Departmental/College Requirements		
<i>Introductory Courses</i>		
PHIL 1120G	Logic, Reasoning, & Critical Thinking ³	3
or PHIL 312	Formal Logic	
<i>Law, Politics, and Ethics</i>		
PHIL 320	Social and Political Philosophy	3
PHIL 373	Ethical Theory	3
PHIL 376	Philosophy of Law	3
<i>Intellectual History</i>		
Select one from the following:		3
HNRS 2140G	Plato and the Discovery of Philosophy	
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
<i>Human Rights and Global Justice</i>		
Select two from the following:		6
PHIL 322	Environmental Ethics	
PHIL 332	Ethics and Global Poverty	
PHIL 385	Human Nature and the Good Life	
<i>Philosophical Writing</i>		
PHIL 448	Writing Philosophy	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Interdisciplinary Perspectives on Law, Politics, and Justice</i>		
HIST 414	The Constitution and U.S. History	3
Select one from the following:		3
CJUS 302	Crime, Justice and Society	
CJUS 306	Criminal Procedural Law	
CJUS 307	Law of Evidence	
CJUS 360	The Juvenile Justice System	
CJUS 399	New Mexico Law	
CJUS 424	Forensic Law	
CJUS 425	Issues in Ethics, Law, and Criminal Justice	
CJUS 428	Mexican-Americans and Issues of Social Justice	
CJUS 429	Immigration & Justice	
CJUS 430	The U.S. Supreme Court and the Criminal Justice System	
CJUS 435	Political Penology	
CJUS 453	Women and Justice	
GNDR 453	Women and Politics	
HNRS 2140G	Plato and the Discovery of Philosophy	
HNRS 2180G	Citizen and State Great Political Issues	
HNRS 304V	Dilemmas of War and Peace	
HNRS 306V	Science, Ethics and Society	
HNRS 335V	Legal Issues in Modern Society	
HNRS 349V	Islam and the West: Cultural Contacts, Conflicts, and Exchanges	
HNRS 353V	Justice without Prejudice	
HNRS 362V	Native American Philosophy and Spirituality	
HNRS 378V	Technology and Policy	
HNRS 387V	Comparative Perspectives on Women	
HNRS 388V	Leadership and Society	
HNRS 390V	Worlds of Buddhism	
PHIL 306	Philosophy Through Film	
PHIL 323V	Engineering Ethics ⁵	

PHIL 328	Applied Ethics	
PHIL 361	Special Topics	
PHIL 435	Internship in Philosophy and Law	
POLS 385	American Political Thought	
POLS 391	Constitutional Law	
POLS 395	Law and Society	
PSYC 330	Psychology and the Law	
SOCI 3510	Crime and Society	
SOCI 3520	Juvenile Delinquency	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 ⁶		50-52
Select sufficient electives to bring total to 120, including 48 upper-division.		
Total Credits		120

- ¹ See the General Education section of the catalog for a full list of courses.
- ² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.
- ³ Students must take PHIL 1145G Philosophy, Law, and Ethics, PHIL 2110G Introduction to Ethics and either PHIL 1120G Logic, Reasoning, & Critical Thinking or PHIL 312 Formal Logic to fulfill the Introductory courses requirement.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁵ PHIL 323V Engineering Ethics will not count towards the Viewing A Wider World requirement, students will need to select two other courses for that requirement.
- ⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Justice, Political Philosophy, and Law there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
PHIL 1145G	Philosophy, Law, and Ethics	3
Area IV: Social and Behavioral Science Course ²		3
PHIL 2110G	Introduction to Ethics	3
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	

HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Elective Courses		4
Credits		30
Sophomore		
Choose from one of the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2215G	Advanced Technical and Professional Communication	
Choose from one of the following:		3
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 312	Formal Logic	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course ²		3-4
Elective Course		6
PHIL 373	Ethical Theory	3
PHIL 320	Social and Political Philosophy	3
VWW: Viewing a Wider World Course ³		3
Elective Courses		6
Credits		30-31
Junior		
PHIL 376	Philosophy of Law	3
Choose from one of the following:		3
HNRS 2140G	Plato and the Discovery of Philosophy	
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
Upper-Division Elective Course ¹		3
PHIL 322	Environmental Ethics	3
PHIL 332	Ethics and Global Poverty	3
VWW: Viewing a Wider World Course ³		3
Upper-Division Elective Course ¹		3
Elective Courses		9
Credits		30
Senior		
PHIL 448	Writing Philosophy ¹	3
Interdisciplinary Perspectives Course (see non-departmental requirements list)		6
Upper-Division Elective Course ¹		9
Elective Courses		12
Credits		30
Total Credits		120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Philosophy - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48

credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics^{1,2}</i>		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>10-11</i>
Area III: Laboratory Sciences Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences Course (4 credits) or an Area IV: Social/Behavioral Sciences Course (3 credits)		
<i>Area V: Humanities</i>		<i>3</i>
Either of the following courses will count towards the Introductory Philosophy Course Departmental/College Requirement also		
PHIL 1115G	Introduction to Philosophy	
or PHIL 2230G	Philosophical Thought	
<i>Area VI: Creative and Fine Arts¹</i>		<i>3</i>
<i>General Education Elective^{1,3}</i>		<i>3</i>
Viewing A Wider World⁴		6
Departmental/College Requirements		
<i>Introductory Philosophy</i>		
This requirement is completed by the Area V: Humanities course		
<i>Ethics</i>		
Select one from the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 373	Ethical Theory	
PHIL 376	Philosophy of Law	
<i>Logic</i>		
PHIL 1120G	Logic, Reasoning, & Critical Thinking ⁵	3
or PHIL 312	Formal Logic	
<i>History of Philosophy</i>		
Select one from the following:		3
HNRS 2140G	Plato and the Discovery of Philosophy	
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
<i>Applied Ethics</i>		
Select one from the following:		3
PHIL 322	Environmental Ethics	
PHIL 323V	Engineering Ethics ⁶	
PHIL 328	Applied Ethics	
PHIL 332	Ethics and Global Poverty	
Select two from the following:		6
PHIL 315	Philosophy of Language	
PHIL 316	Philosophy of Mathematics	
PHIL 346	Philosophy of Mind	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
PHIL 380	Metaphysics	
<i>Philosophical Writing</i>		
PHIL 448	Writing Philosophy	3
<i>Additional Requirements</i>		

Select at least an additional 12 credits in philosophy, 6 of which are courses numbered 300 or above. The following HNRS course may replace a 300 level or above philosophy course.

HNRS 2140G	Plato and the Discovery of Philosophy	12
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total to 120, including 48 upper-division. ⁷		47-49
Total Credits		120

¹ See the General Education section of the catalog for a full list of courses.

² A Mathematics is required for the degree but students may need to take any prerequisites needed to enter the course first.

³ The General Education Elective requirement will be satisfied with one of the "G" courses that are options under the Logic and history of Philosophy requirements listed under the Departmental/College Requirements section.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ For the Logic course requirement, students can take either PHIL 1120G Logic, Reasoning, & Critical Thinking or PHIL 312 Formal Logic. If students select PHIL 312, it will not count towards the General Education Elective requirement.

⁶ PHIL 323V will not count towards the Viewing A Wider World requirement, students will need to select two other courses for that requirement.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Philosophy there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
MATH 1130G	Survey of Mathematics ¹	3
PHIL 2230G	Philosophical Thought	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course ²		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area III: Laboratory Science Course ²		4

Area VI: Fine Arts Course ²	3
General Education Elective Course ²	3
Elective Course	1

Credits 30

Sophomore

Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication ¹	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
PHIL Elective Course		3
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course ²		3-4
Choose from one of the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 373	Ethical Theory	
PHIL 376	Philosophy of Law	
VWW: Viewing a Wider World Course ³		3
Elective Courses		15

Credits 30-31

Junior

Choose from one of the following:		3
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 312	Formal Logic	
Choose from one of the following:		3
PHIL 315	Philosophy of Language	
PHIL 316	Philosophy of Mathematics	
PHIL 346	Philosophy of Mind	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
PHIL 380	Metaphysics	
Choose from one of the following:		3
PHIL 315	Philosophy of Language	
PHIL 316	Philosophy of Mathematics	
PHIL 346	Philosophy of Mind	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
PHIL 380	Metaphysics	
Choose from one of the following:		3
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
HNRS 2140G	Plato and the Discovery of Philosophy	
VWW: Viewing a Wider World Course ³		3
Upper-Division Elective Courses		9
Elective Courses		6

Credits 30

Senior

PHIL 448	Writing Philosophy ¹	3
PHIL Applied Ethics Elective Course (choose from list)		3
PHIL Elective Course (any level)		3
PHIL Upper-Division Elective Course		6
Upper-Division Elective Courses		12
Elective Course		3

Credits 30

Total Credits 120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Ethics - Undergraduate Minor

A student who earns a Bachelor of Arts in Philosophy may not also earn a minor in Ethics.

Prefix	Title	Credits
Required Courses		
PHIL 1115G	Introduction to Philosophy	3
or PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	3
or PHIL 312	Formal Logic	
PHIL 373	Ethical Theory	3
Select three from the following, of which at least two must be upper division: ¹		9
CJUS 425	Issues in Ethics, Law, and Criminal Justice	
HNRS 304V	Dilemmas of War and Peace	
HNRS 306V	Science, Ethics and Society	
JOUR 377V	Mass Media Ethics	
PHIL 322	Environmental Ethics	
PHIL 323V	Engineering Ethics	
PHIL 328	Applied Ethics	
PHIL 332	Ethics and Global Poverty	
SUR 401	Ethics and Professionalism in Surveying and Mapping	
Total Credits		18

¹ Students may earn up to 3 credits in this category from special topics or Honors courses approved by the head of the Department of Philosophy.

Justice, Poltical Philosophy, and Law - Undergraduate Minor

The aim of Justice, Political Philosophy, and Law is to cultivate a reasoned understanding of law and legal institutions, as well as the moral theories that support the value and justice of these institutions. The JPPL minor offers a sequence of courses in critical thinking, law, policy, global justice, ethical theory, political philosophy, moral theory, and human rights. JPPL students will be well-prepared for further studies or careers in law, philosophy, politics, public service, education, human rights, or public policy.

Prefix	Title	Credits
<i>Introductory Courses</i>		
Select one from the following:		3
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 1115G	Introduction to Philosophy	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	3
or PHIL 312	Formal Logic	
PHIL 2110G	Introduction to Ethics	3
<i>Philosophy of Law</i>		
PHIL 376	Philosophy of Law	3

<i>Human Rights and Global Justice</i>		
Select one from the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 322	Environmental Ethics	
PHIL 332	Ethics and Global Poverty	
PHIL 341	Ancient Philosophy	
PHIL 373	Ethical Theory	
PHIL 448	Writing Philosophy	
<i>Elective</i>		
Select one from the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 322	Environmental Ethics	
PHIL 323V	Engineering Ethics	
PHIL 328	Applied Ethics	
PHIL 332	Ethics and Global Poverty	
PHIL 344	Modern Philosophy	
PHIL 373	Ethical Theory	
PHIL 376	Philosophy of Law	
PHIL 448	Writing Philosophy	
Total Credits		18

Philosophy - Undergraduate Minor

A student who earns a Bachelor of Arts in Philosophy may not also earn a minor in Philosophy.

Prefix	Title	Credits
Required Courses		
PHIL 1115G	Introduction to Philosophy	3
or PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	3
or PHIL 312	Formal Logic	
Select one from the following:		3
PHIL 2110G	Introduction to Ethics	
PHIL 328	Applied Ethics	
PHIL 373	Ethical Theory	
Select 9 credits from Philosophy at the 300 or above level		9
Total Credits		18

Physics Undergraduate Program Information

A bachelor’s degree in physics or engineering physics provides the basis for careers in industry, teaching, the military, government or for study toward advanced degrees in physics or engineering. It should also provide the skills that recipients of physics degrees have listed as among the most important in obtaining their current positions, including problem solving ability, computer skills, mathematical skills, and laboratory skills, as well as knowledge of physics.

Further information about the department may be found on the web at phys.nmsu.edu (https://phys.nmsu.edu). All incoming (new or transfer) students must schedule an orientation meeting with the department head and/or the undergraduate program head before their first semester at NMSU. All students will be assigned a faculty advisor in the physics department to discuss course selection, career resources, internships and coops, and other topics.

Graduate Program Information

The Department of Physics offers programs in many areas of emphasis leading to the MS and Ph.D. degrees. Admission to these programs is competitive and selection of applicants is based on undergraduate and/or previous graduate grade-point averages, performance on the general and subject Graduate Record Examination, other evidence of prior academic and research accomplishments submitted by the applicant, and reference letters, as well as, in the case of applicants for the doctoral program, matching of the applicant's research interests, as described by the student's statement of purpose, to the Department's research activities.

All degree-seeking graduate students must satisfy the relevant Graduate School requirements, successfully complete a 3-credit, 500-level laboratory, and demonstrate or develop knowledge of computer programming. All Ph.D. students and non-thesis Master's students must pass a qualifying examination based on undergraduate physics courses at the 400 level. Additional course requirements are described below; courses taken S/U may not be used to satisfy any of the degree requirements, including the lab requirement for Master's and Ph.D. students.

The qualifying and comprehensive examination outcomes are decided by vote of the entire faculty, based on the recommendations of the corresponding examination committees. For the qualifying examination, the faculty may decide that

- a student pass at the doctoral level;
- pass at the master's level;
- be requested to retake the exam at the next available opportunity; or
- terminate graduate study.

For the written part of the comprehensive examination, the faculty may decide that

- a student be given an unconditional pass;
- be given a conditional pass, with the requirement that the student produce additional evidence of research accomplishments during the oral part of the exam before being granted admission to candidacy;
- repeat the written part the next time it is offered; or
- terminate graduate study.

In addition, the faculty may decide to discontinue financial support to a student based on the student's performance on the qualifying or comprehensive examination. Students will receive written notification of the exam's outcome from the Graduate Physics Program Head within 30 days of the exam. Appeals must be addressed to the Physics Department Head within 30 days of receiving written notification of the exam's outcome and will be decided by the physics faculty.

A student granted an unconditional or conditional pass on the written part of the comprehensive examination must take the oral part in the same semester that the written part was taken; the student's Ph.D. committee makes the final decision, following the oral part of the comprehensive examination, on admission of the student to the candidacy to the doctoral degree.

Students may choose areas of emphasis from a variety of experimental, theoretical and computational research programs in the department. The current major research areas of the department include condensed matter physics and materials science, geophysics, optics, particle and nuclear physics, and others. These research projects are supported by

multimillion-dollar funding by various federal agencies and two national laboratories within the state of New Mexico: Los Alamos National Laboratory and Sandia National Laboratories. In addition to the in-house research, the department conducts collaborative research programs with

- The Brookhaven National Laboratory,
- The Center for Integrated NanoTechnologies,
- Los Alamos National Laboratory,
- Sandia National Laboratories,
- The Thomas Jefferson Laboratory,
- Fermilab,
- Air Force Research Laboratory and
- other national and international laboratories.

The MS in Physics with a concentration in Space Physics program provides students with a strong foundation in physics with an intensive focus on space physics. Graduate study in space physics at the master's level prepares graduates for continued and specialized study toward the doctorate program in space-related fields as well as for challenges they will confront in space industrial and government settings.

The department is housed in a newly-renovated building which contains research laboratories, classrooms, offices and a computational laboratory.

Degrees for the Department

Bachelor Degree(s)

- Physics - Bachelor of Arts (p. 820)
- Physics - Bachelor of Science (p. 822)

Master Degree(s)

- Physics (Space Physics) - Master of Science (p. 158)
- Physics - Master of Science (p. 158)

Doctoral Degree(s)

- Physics - Doctor of Philosophy (p. 198)

Minors for the Department

- Physics - Graduate Minor (p. 218)
- Physics - Undergraduate Minor (p. 824)

Professor, Stefan Zollner, Department Head

Professor, Stephen Pate, Undergraduate Program Head

Professor, Vassili Papavassiliou, Graduate Program Head

Professor, Boris Kiefer, Engineering Physics Program Head

Professors Ma. Burkardt, Engelhardt, Kiefer, Papavassiliou, Pate, Vasiliev, Zollner; **Associate Professors** Hearn, Urquidi; **Assistant Professors** Paolone, Sievert; **College Professors** Mi. Burkardt; **College Research Professors** Bruce; **Emeritus Faculty** Burleson, DeAntonio, Gibbs, Goedecke, Kanim, Kyle, Nakotte, Ni.

Graduate Faculty S. Zollner, Department Head, Ph.D. (Stuttgart)– experimental condensed matter and applied physics; V. Papavassiliou, Graduate Program Head, Ph.D. (Yale)– experimental nuclear and particle physics; M. Burkardt, Ph.D. (Erlangen)– theoretical nuclear and particle physics; M. Engelhardt, Ph.D. (Erlangen)– computational nuclear and particle physics; E. Fohntung,

Ph.D. (Freiburg)– materials science, neutron and X-ray scattering; T. M. Hearn, Ph.D. (Cal Tech)– seismic tomography, seismology; B. Kiefer, Ph.D. (Michigan)– computational condensed matter physics, mineral physics; H. Nakotte, Ph.D. (Amsterdam)– materials science, neutron scattering; J. Ni, Ph.D. (Cornell)– geophysics, seismology; M. Paolone, Ph.D. (South Carolina)– experimental nuclear and particle physics; S. F. Pate, Ph.D. (Pennsylvania)– experimental nuclear and particle physics; M. Schlegel, Ph.D. (Bochum)– theoretical nuclear and particle physics; M. Sievert, Ph.D. (Ohio State)– theoretical nuclear and particle physics; I. Vasiliev, Ph.D. (Minnesota)– computational materials science; L. Waszek, Ph.D. (Cambridge)– geophysics, seismology; P. T. Webster, Ph.D. (Arizona State)– materials science.

Geophysics Courses

GPHY 450. Selected Topics

1-3 Credits

Readings, discussions, lectures or laboratory studies of selected areas of geophysics. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

GPHY 520. Selected Topics

1-3 Credits

Formal treatment of graduate topics not covered in regular courses. May be repeated for unlimited credit.

Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

GPHY 560. Applied Inverse Theory

3 Credits (3)

Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, over determined and under determined problems, linear and nonlinear problems. Computing experience desirable. Consent of Instructor required.

GPHY 598. Special Research Problems

1-3 Credits

Individual investigations, either analytical or experimental. May be repeated for unlimited credit.

GPHY 599. Master's Thesis

1-15 Credits (1-15)

Thesis.

GPHY 620. Advanced Topics in Geophysics

3 Credits (3)

Advanced formal treatment of a topic or topics not covered in regular courses. May be repeated for unlimited credit.

Prerequisite: consent of instructor.

GPHY 700. Doctoral Dissertation

1-15 Credits (1-15)

Dissertation.

Physics Courses

PHYS 1111. Introductory Computational Physics

3 Credits (2+2P)

Introduction to computational techniques for the solution of physics-related problems.

Prerequisite(s): a C- or better in MATH 1220G or MATH 1250G or MATH 1511G.

PHYS 1112. Introductory Physics for the Health Sciences

3 Credits (3)

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

Prerequisite(s): MATH 1215 or Equivalent.

Learning Outcomes

1. The objective of the course is to familiarize the student with the concepts and methods used in the underlying physics associated with various Health Science disciplines.
2. The course will demonstrate how the basic principles of mechanics, thermodynamics, electricity, magnetism, electromagnetic waves and optics can be applied to solve particular problems in Health Sciences applications. Introduces the student to selected topics in modern physics including quantum physics, atomic and nuclear physics.

PHYS 1115G. Survey of Physics with Lab

4 Credits (3+3P)

Overview of the concepts and basic phenomena of physics. This course provides a largely descriptive and qualitative treatment with a minimum use of elementary mathematics to solve problems. No previous knowledge of physics is assumed. Includes laboratory.

Learning Outcomes

1. Apply concepts of classical mechanics (such as velocity, acceleration, force, inertia, momentum, torque, work, energy) to simple static and dynamic systems.
2. Apply concepts of thermodynamics (such as heat, temperature, internal energy, entropy) to simple processes.
3. Apply concepts of electricity and magnetism (such as fields, potential, charge conservation, static and dynamic induction) to simple circuits, motors, and other simple contrivances.
4. Apply simple geometric and wave optics in simple situations.
5. Test ideas using modern laboratory equipment.
6. Estimate experimental uncertainties.
7. Use computers to analyze and report laboratory results.
8. Draw appropriate conclusions from quantitative scientific observations.
9. Accurately and clearly communicate the results of scientific experiments.

PHYS 1125G. Physics of Music**4 Credits (3+2P)**

Introduction for non-science majors to basic concepts, laws, and skills in physics, in the context of a study of sound, acoustics, and music.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply basic classical mechanics to static and dynamic fluids, including Archimedes' principle and Bernoulli's principle.
3. Apply the general properties of waves to simple models of musical instruments.
4. Demonstrate knowledge of basic operating principles of wind, string, and percussion instruments.
5. Demonstrate knowledge of how objectively measurable properties of sound waves correspond to the perceptions of pitch, loudness, and timbre.
6. Demonstrate understanding of the description of vibrations and waves in terms of Fourier's Theorem and normal modes.
7. Demonstrate understanding of vocalization in terms of physical principles such as resonance and fluid dynamics.
8. Demonstrate understanding of how the ear works.

PHYS 1230G. Algebra-Based Physics I**3 Credits (3)**

An algebra-based treatment of Newtonian mechanics. Topics include kinematics and dynamics in one and two dimensions, conservation of energy and momentum, rotational motion, equilibrium, and fluids.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of particles in one and two dimensions.
3. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of a rigid body in two dimensions.
4. Apply Newton's theory of gravitation to circular orbits and demonstrate understanding of how Kepler's laws of planetary motion provide the empirical foundation for Newton's theory.
5. Apply the mathematics of vectors to the principles of Newtonian mechanics.
6. Apply principles of Newtonian mechanics to the case of static and dynamic incompressible fluids, including Archimedes' and Bernoulli's principles.

PHYS 1230L. Algebra-Based Physics I Lab**1 Credit (1)**

A series of laboratory experiments associated with the material presented in PHYS 1230G.

Prerequisite(s)/Corequisite(s): PHYS 1230G.

Learning Outcomes

1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1240G. Algebra-Based Physics II**3 Credits (3)**

The second half of a two semester algebra-based introduction to Physics. This course covers electricity, magnetism and optics.

Prerequisite(s): a C- or better in PHYS 1230G or PHYS 2230G.

Learning Outcomes

1. Be able to state Coulomb's Law and Gauss's laws and apply them.
2. Apply the concepts of electric charge, electric field and electric potential to solve problems.
3. Analyze simple DC and AC circuits.
4. Apply the Lorentz force to solve problems.
5. Apply Faraday's law of induction (and Lenz's law) to solve problems.
6. Apply ray optics to practical lens systems such as microscopes and corrective lenses.
7. Apply the wave nature of light to the phenomena of reflection, refraction, and diffraction.

PHYS 1240L. Algebra-Based Physics II Lab**1 Credit (1)**

A series of laboratory experiments associated with the material presented in PHYS 1240

Prerequisite(s)/Corequisite(s): PHYS 1240G.

Learning Outcomes

1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1310G. Calculus -Based Physics I**3 Credits (3)**

A calculus level treatment of classical mechanics and waves, which is concerned with the physical motion concepts, forces, energy concepts, momentum, rotational motion, angular momentum, gravity, and static equilibrium.

Prerequisite: a C- or better in ENGR 190 or MATH 1511G or higher.

Learning Outcomes

1. Describe the relationships among position, velocity, and acceleration as functions of time.
2. Use the equations of kinematics to describe motion under constant acceleration.
3. Analyze linear motion using Newton's laws, force, and linear momentum.
4. Analyze rotational motion using torque and angular momentum.
5. Analyze motion using work and energy.

PHYS 1310L. Calculus -Based Physics I Lab**1 Credit (3P)**

A series of laboratory experiments associated with the material presented in Calculus-based Physics I. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-based Physics I.

Prerequisite(s)/Corequisite(s): PHYS 1310G.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment.

PHYS 1311. Problems in Calculus-Based Physics I**0.5-1 Credits (.5-1)**

This is a supplemental course for Calculus-based Physics I. May be repeated up to 1 credits.

Corequisite(s): PHYS 1310G.

PHYS 1320G. Calculus -Based Physics II**3 Credits (3)**

A calculus level treatment of classical electricity and magnetism. It is strongly recommended that this course is taken at the same time as Calculus-based Physics II laboratory.

Prerequisite: a C- or better in (PHYS 2110 or PHYS 1310G) and (ENGR 190 or MATH 1521G or higher).

Learning Outcomes

1. Apply the concepts of electric charge, electric field and electric potential to solve problems.
2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge.
3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current.
4. Describe the relationship between electric field and electric potential.
5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles.
6. Apply the integral forms of Maxwell's equations.
7. Calculate the energy of electromagnetic fields.
8. Analyze DC circuits.

PHYS 1320L. Calculus -Based Physics II Lab**1 Credit (3P)**

A series of Laboratory experiments associated with the material presented in Calculus-Based Physics II. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-Based Physics II.

Prerequisite(s)/Corequisite(s): PHYS 1320G. Prerequisite(s): A C- or better in PHYS 2110L or PHYS 1310L.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment

PHYS 1321. Problems in Calculus-Based Physics II**0.5-1 Credits (.5-1)**

This is a supplemental course for Calculus-based Physics II.

Corequisite(s): PHYS 1320G.

PHYS 2110. Mechanics**3 Credits (3)**

Newtonian mechanics.

Prerequisite(s)/Corequisite(s): MATH 1511G or higher.

PHYS 2110L. Experimental Mechanics**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2110. Science majors.

Prerequisite(s)/Corequisite(s): PHYS 2110.

PHYS 2111. Supplemental Instruction to PHYS 2110**1 Credit (1)**

This Optional workshop as a supplement to PHYS 2110. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credit.

Corequisite: PHYS 2110.

Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2110, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2120. Heat, Light, and Sound**3 Credits (3)**

Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound. May be repeated up to 3 credits.

Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.

PHYS 2120L. Heat, Light, and Sound Laboratory**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2120. Science majors.

Prerequisite: a C- or better in PHYS 2110L or PHYS 1310L.

Prerequisite/Corequisite: PHYS 2120.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2121. Supplemental Instruction to PHYS 2120**1 Credit (1)**

This optional workshop supplements PHYS 2120 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 2120 to problem solving and quantitative analysis. May be repeated up to 1 credit.

Corequisite: PHYS 2120.

Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2121, apply quantitative analysis to solve problems involving wave propagation and interference, geometric optics, heat transfer and thermodynamics.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline

PHYS 2140. Electricity and Magnetism**3 Credits (3)**

Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 1521G. Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.

PHYS 2140L. Electricity & Magnetism Laboratory**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2140.

Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G.

Prerequisite/Corequisite: PHYS 2140.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2141. Supplemental Instruction to PHYS 2140**1 Credit (1)**

Optional workshop as a supplement to PHYS 2140. The tutorial sessions focus on reasoning and hands-on problem solving.

Corequisite: PHYS 2140.

Learning Outcomes

1. Analyze real-world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2140, apply quantitative analysis to solve problems, including the use of symmetry to study electric and magnetic fields. Practice concepts of calculus applied to charge and current distributions.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2230G. General Physics for Life Science I**3 Credits (3)**

This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

Prerequisite: A C- or better in MATH 1220G or higher.

Learning Outcomes

1. Modeling: analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain phenomena or function; use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text; critique assumptions and determine how to test the validity of a model and use the comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: describe the motion of any object in terms of displacement, velocity, and acceleration; analyze external forces acting on an object and determine if a system is in equilibrium or relate the net force to changes in motion; predict or analyze motion using conservation laws for energy and momentum; analyze forces and torques for a rigid object in static equilibrium; for a static fluid determine pressure and the buoyant force; apply idealized models of fluid flow to the circulatory system; describe the properties of pressure waves known as sound, apply the model of standing waves to musical instruments and discuss how sound is used to sense the environment; predict qualitative changes in the internal energy of a thermodynamic system when energy has been transferred due to work or heat and justify those predictions using conservation of energy (First law of thermodynamics). Identify which heat transfer processes occur in a described situation.
3. Quantitative reasoning: use a physics problem-solving strategy (Identify relevant concepts; Introduce and study simplified models; Use symmetry arguments; Establish the relation between known and unknown quantities; Calculate a quantitative result using appropriate mathematical methods; Self-check reasonableness of assumptions and solutions); use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2230L. Laboratory to General Physics for Life Science I**1 Credit (1)**

Laboratory experiments in topics associated with material presented in PHYS 2230G.

Prerequisite(s)/Corequisite(s): PHYS 2230G. Restricted to Las Cruces campus only.

PHYS 2231. Supplemental Instruction to General Physics for Life Sciences I**1 Credit (1)**

This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.

Corequisite: PHYS 2230G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2230, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2240G. General Physics for Life Science II**3 Credits (3)**

This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

Prerequisite: a C- or better in PHYS 1230G or PHYS 2230G, and MATH 1220G or higher.

Learning Outcomes

1. Modeling: analyze real world phenomena by constructing simplified idealized models (an abstract description) that allow making predictions or explaining a phenomena or function; use multiple representations to build and communicate the model, including sketches, mathematical expressions, diagrams or graphs; decide what information is relevant and critique assumptions and models of others; determine how to test the validity of a model and use comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: electric or magnetic fields can be used to describe interactions of objects that contain charges with their surroundings; changes that occur as a result of interactions are constrained by conservation laws (such as conservation of energy, conservation of charge or conservation of nucleon number); many macroscopic properties of materials can be described using microscopic models or related to their geometry; electromagnetic radiation can be modeled as a wave or as fundamental particles (photons); the direction of propagation of a wave may change when it encounters a boundary surface between two media of different properties (reflection or refraction); the spontaneous radioactive decay of nuclei is described by probability.
3. Quantitative reasoning: apply quantitative analysis and appropriate mathematical reasoning to describe or explain phenomena; use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations (e.g. field lines, equipotential lines) and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2240L. Laboratory to General Physics for Life Science II**1 Credit (1)**

Laboratory experiments in topics associated with material presented in PHYS 2240.

Prerequisite(s)/Corequisite(s): PHYS 2240G. Restricted to Las Cruces campus only.

PHYS 2241. Supplemental Instruction to General Physics for Life Sciences II**1 Credit (1)**

This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

Corequisite(s): PHYS 2240G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2240, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2996. Special Topics**1-3 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

PHYS 2997. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

PHYS 303V. Energy and Society in the New Millennium**3 Credits (3)**

Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

PHYS 304. Forensic Physics**4 Credits (3+3P)**

Theories, laboratory, and field techniques in the area of forensic physics.

PHYS 305V. The Search for Water in the Solar System**3 Credits (3)**

Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.

PHYS 315. Modern Physics**3 Credits (3)**

An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles.

Prerequisite(s): a C- or better in MATH 2530G and PHYS 2140 or PHYS 1320G.

Learning Outcomes

1. Communication: an ability to communicate effectively with a range of audiences.
2. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 315 L. Experimental Modern Physics**3 Credits (1+6P)**

Elementary laboratory in modern physics which supports the subject matter in PHYS 315. Required for physics majors. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or 1320L.

PHYS 316. Supplemental Instructions to PHYS 315**1 Credit (1)**

This optional workshop supplements PHYS 315 "Modern Physics". Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.

Corequisite(s): PHYS 315.

PHYS 325. Intermediate Experimental Physics**3 Credits (1+6P)**

An exploration of a variety of experimental techniques in physics with an emphasis on the proper determination of statistical and systematic uncertainties. Students will work in teams and prepare professional written and oral reports of their work. This course cannot be used to replace M E 345 for students majoring in engineering.

Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or PHYS 1320L.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 350. Special Topics**1-3 Credits**

Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

PHYS 380. Individual Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 395. Intermediate Mathematical Methods of Physics**3 Credits (3)**

Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. This course cannot be used to replace M E 228 or M E 328 for students majoring in engineering. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 392. Prerequisite(s): a C- or better in MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 420. Capstone Project I**3 Credits (3P)**

Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

PHYS 421. Capstone Project II**3 Credits (3P)**

Continuation of PHYS 420.

PHYS 450. Selected Topics**1-3 Credits**

Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

PHYS 451. Intermediate Mechanics I**3 Credits (3)**

Newtonian mechanics, including an introduction to the Lagrangian formulation. Topics include central force motion, rigid body motion, noninertial reference frames, oscillating systems, and classical scattering.

Prerequisite(s)/Corequisite(s): MATH 392. **Prerequisite(s):** a C- or better in PHYS 2110 or PHYS 1310G, and MATH 2530G.

Learning Outcomes

1. Set up equations of motion for classical mechanical systems and solve them.
2. Identify conserved quantities and understand the circumstances under which they arise (symmetries); in particular, know how to use conservation of energy, momentum, angular momentum to solve problems.
3. Fluently use three-dimensional calculus as a language to do the above; be able to use spherical and cylindrical coordinates.
4. Understand the paradigmatic examples of the harmonic oscillator, central force (in particular, gravitational) motion and rigid body motion, which serve as starting points for investigating more complicated realistic problems.

PHYS 454. Intermediate Modern Physics I**3 Credits (3)**

Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension.

Prerequisite: a C- or better in PHYS 315.

Prerequisite/Corequisite: MATH 392 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 455. Intermediate Modern Physics II**3 Credits (3)**

Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms.

Prerequisite: a C- or better in PHYS 454, MATH 392, and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 461. Intermediate Electricity and Magnetism I**3 Credits (3)**

The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter.

Prerequisite: a C- or better in PHYS 2140 or PHYS 1320G or equivalent and a C- or better in MATH 2530G.

Prerequisite/Corequisite: MATH 392 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 462. Intermediate Electricity and Magnetism II**3 Credits (3)**

Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics.

Prerequisite: a C- or better in PHYS 461, MATH 392, and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 468. Intermediate X-ray Diffraction**3 Credits (3)**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. **Prerequisite(s):** a C- or better in PHYS 315 and PHYS 325

Learning Outcomes

1. Knowledge of structural properties of materials
2. Experimental x-ray characterization techniques
3. Presentation and writing skills in the discipline
4. Ethics, teamwork, and career opportunities

PHYS 471. Modern Experimental Optics**3 Credits (1+6P)**

Cumulative experience course in experimental optics.

Prerequisite: a C- or better in PHYS 315 and PHYS 325.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 475. Advanced Laboratory Practices for Materials**3 Credits (1+6P)**

Cumulative experience course in advanced laboratory practices involving experiments in atomic, molecular, and condensed matter physics.

Prerequisite: a C- or better in PHYS 315 and (PHYS 315 L or PHYS 325).

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 476. Computational Physics**3 Credits (3)**

Scientific visualization, numerical differentiation and interpolation, numerical integration, root finding, linear algebra, eigensystems, ODE's, Boundary value problems, PDE's, Monte-Carlo calculations, data description and analysis, Fast Fourier Transforms, and applications to advanced physics problems. Recommended is the knowledge of a programming language.

Prerequisite(s): a C- or better in PHYS 1111 or equivalent and MATH 392.

Learning Outcomes

1. learn how to use computers for solving problems in the physical sciences,
2. obtain skills to implement numerical simulation and modeling strategies,
3. learn how to monitor and analyze data graphically, during and after computation,
4. obtain workflow organization skills needed for the solution of complicated systems.

PHYS 480. Thermodynamics**3 Credits (3)**

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases.

Prerequisite: a C- or better in PHYS 2120, PHYS 315, and MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 485. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 488. Introduction to Condensed Matter Physics**3 Credits (3)**

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties.

Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of solid-state physics: classification of solids, crystal structure, band structure of solids, lattice vibrations, optical and magnetic properties of solids.
2. Develop an ability to formulate and solve complex problems in solid state physics by applying the fundamental principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 489. Introduction to Modern Materials**3 Credits (3)**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties.

Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 493. Experimental Nuclear Physics**3 Credits (1+6P)**

Cumulative experience course in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry.

Prerequisite: a C- or better in PHYS 315 and (PHYS 315L or PHYS 325).

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communications: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 495. Mathematical Methods of Physics I**3 Credits (3)**

Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.

Prerequisite(s): a C- or better in MATH 392 and PHYS 395.

Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 500. Special Topics Seminar**1-2 Credits**

Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

PHYS 511. Mathematical Methods of Physics I**3 Credits (3)**

Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.

Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 520. Selected Topics**1-3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: CHME 467. May be repeated up to 3 credits.

Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

PHYS 521. Individual Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

PHYS 528. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures.

Taught with E E 478. Crosslisted with: E E 528.

Prerequisite: (PHYS 1320G or PHYS 2120) and E E 473/PHYS 473.

Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

PHYS 551. Classical Mechanics**3 Credits (3)**

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

PHYS 554. Quantum Mechanics I**3 Credits (3)**

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

PHYS 555. Quantum Mechanics II**3 Credits (3)**

Continuation of topics in PHYS 554.

Prerequisites: PHYS 554 or consent of instructor.

PHYS 561. Electromagnetic Theory I**3 Credits (3)**

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

PHYS 562. Electromagnetic Theory II**3 Credits (3)**

Continuation of topics in PHYS 561.

Prerequisites: PHYS 561 or consent of instructor.

PHYS 568. Elements of X-ray Diffraction**3 Credits (3)**

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

PHYS 571. Advanced Experimental Optics**3 Credits (1+6P)**

Taught with PHYS 471 with additional work required at the graduate level.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 575. Advanced Physics Laboratory**3 Credits (1+6P)**

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 576. Advanced Computational Physics I**3 Credits (3)**

Advanced treatment of topics listed under PHYS 476 plus additional work. Applications of numerical methods to advanced physics problems. Recommended is the knowledge of a programming language.

Learning Outcomes

1. learn to numerically solve problems that require higher mathematical and theoretical analysis,
2. experience how graduate research will be advanced and accelerated by the use of scientific computing skills.

PHYS 584. Statistical Mechanics**3 Credits (3)**

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

PHYS 589. Modern Materials**3 Credits (3)**

Same as PHYS 489 with differentiated assignments for graduate students. PHYS 554 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 591. Advanced High-Energy Physics I**3 Credits (3)**

Taught with PHYS 491 with additional work required at the graduate level.

Prerequisite(s): PHYS 555 or consent of instructor.

PHYS 593. Advanced Experimental Nuclear Physics**3 Credits (1+6P)**

Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 597. Space Plasma Physics**3 Credits (3)**

Same as PHYS 497 but with added requirements.

PHYS 599. Master's Thesis**1-15 Credits (1-15)**

Thesis.

PHYS 600. Research**1-15 Credits**

Doctoral research. May be repeated.

PHYS 620. Advanced Topics in Physics**1-3 Credits**

Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.

Prerequisite: consent of instructor.

PHYS 650. General Relativity I**3 Credits (3)**

Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.

Prerequisite(s): PHYS 511 or PHYS 561 or consent of instructor.

PHYS 680. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: graduate standing or consent of instructor.

PHYS 688. Advanced Condensed Matter Physics**3 Credits (3)**

Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

Learning Outcomes

1. Learn the fundamental concepts of advanced condensed state physics: band theory of solids, electronic structure methods, optical and magnetic properties of solids, bulk semiconductors, and properties of nano-structured materials.
2. Develop an ability to formulate and solve complex problems in advanced condensed matter physics.
3. Develop an ability to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 689. Advanced Modern Materials**3 Credits (3)**

Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. PHYS 555, PHYS 588, and PHYS 589 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystalline, amorphous, polymeric, nanostructured, layered, and composite materials.
2. Develop an ability to formulate and solve complex problems in the area of advanced physics of modern materials.
3. Develop an ability to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 691. Quantum Field Theory I**3 Credits (3)**

Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.

Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.

PHYS 692. Quantum Field Theory II
3 Credits (3)

QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.
Prerequisite: PHYS 691 or consent of instructor.

PHYS 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation.

Phone: (575) 646-3831
Website: <https://phys.nmsu.edu/> (<https://phys.nmsu.edu>)

Physics - Bachelor of Arts

The curriculum for the Bachelor of Arts degree is designed for students who would like to have a firm foundation in physics combined with study in another area and greater flexibility in choosing elective courses. The program requires a minor in a second field of study chosen by the student in consultation with an advisor. A second major may be used to satisfy the program requirement for a minor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
Area III: Laboratory Sciences Course (4 credits) ^{1,3}		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ^{1,3}		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World ⁴		6
Departmental Requirements ⁵		
PHYS 1111	Introductory Computational Physics	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3

PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁵		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
Select 18 credits from a Minor in a second field from another department		18
Second Language Requirement: (required - see below)		0-8
Electives, to bring the total credits to 120 ^{5,6}		5-14
Total Credits		120

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses.
- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ³ See alternatives for meeting General Education requirements.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses
- ⁵ May not be taken S/U and must earn a grade of C- or better.
- ⁶ Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their Physics Advisor.

Second Language Requirement

For the Bachelor of Arts in Physics there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	8
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
<i>For Heritage Speakers:</i>		
SPAN 1220 or SPAN 2210	Spanish for Heritage Learners II and Spanish for Heritage Learners III	3

PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
<i>OR</i>		
Challenge the 1110/1120/1220/2210 level for the following courses:		
PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Suggested Minors for the Bachelor of Arts Physics Major

Astronomy Minor— A Bachelor of Arts in Physics with a minor in Astronomy provides an excellent preparation for students who wish to pursue graduate studies in Astrophysics or Astronomy.

Pre-Medicine Studies Minor— Students wishing to attend a medical or dental post-graduate school are strongly encouraged to obtain a minor in a life science field such as biochemistry, biology, human biology or microbiology.

Prelaw Minor— Students wishing to attend a post-graduate law school should obtain a minor in a law-related field, such as government, accounting, finance, or international business.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
PHYS 1111	Introductory Computational Physics ¹	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ¹	4
PHYS 2111	Supplemental Instruction to PHYS 2110	1
Credits		16
Semester 2		
ENGL 2210G	Professional & Technical Communication ¹	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ¹	4
PHYS 2141	Supplemental Instruction to PHYS 2140 ¹	1
Area V: Humanities Course ²		3
Credits		15
Second Year		
Semester 1		
MATH 2530G	Calculus III ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4
PHYS 2121	Supplemental Instruction to PHYS 2120	1
Area VI: Creative and Fine Arts Course ²		3
Minor (or Elective) Course		3
Credits		14
Semester 2		
MATH 392	Introduction to Ordinary Differential Equations ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 316	Supplemental Instructions to PHYS 315	1
PHYS 325	Intermediate Experimental Physics ¹	3
COMM 1115G	Introduction to Communication	3
Minor (or Elective) Course		3
Credits		16
Third Year		
Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
PHYS 451	Intermediate Mechanics I ¹	3
PHYS 461	Intermediate Electricity and Magnetism I ¹	3
VWW: Viewing a Wider World Course ³		3

First Course in Second Language Series	3-4
Credits	15-16
Semester 2	
PHYS 462 Intermediate Electricity and Magnetism II ¹	3
PHYS 480 Thermodynamics ¹	3
VWW: Viewing a Wider World Course ³	3
Area IV: Social and Behavioral Science Course ²	3
Next Course in Second Language Series ¹	3-4
Credits	15-16
Fourth Year	
Semester 1	
PHYS 454 Intermediate Modern Physics I ¹	3
Minor (or Elective) Course	3
Minor (or Elective) Course	3
Minor (or Elective) Course	3
Elective Course	3
Credits	15
Semester 2	
PHYS 455 Intermediate Modern Physics II ¹	3
Minor (or Elective) Course	3
Minor (or Elective) Course	3
Elective Course	3
Elective Course	2-0
Credits	14-12
Total Credits	120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Physics - Bachelor of Science

A Bachelor of Science degree in physics at NMSU prepares a student well for graduate study in physics, geophysics, or engineering or for a variety of careers in research and teaching. Students who plan to seek employment at the B.S. level are advised to take the concentration area curricula as part of their electives in addition to the general and departmental requirements. The program of study should be chosen by the student in consultation with an advisor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. The Bachelor of Science degree in physics is accredited by the Applied and Natural Science Accreditation Commission (ANSAC) of ABET, Inc.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1 ¹</i>		
<i>English Composition - Level 2 ¹</i>		

Oral Communication ¹

<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences Course (4 credits) ^{1,3}</i>		<i>10-11</i>
<i>Area IV: Social/Behavioral Sciences Course (3 credits) ¹</i>		
<i>Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ^{1,3}</i>		
<i>Area V: Humanities ¹</i>		<i>3</i>
<i>Area VI: Creative and Fine Arts ¹</i>		<i>3</i>
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World ⁴		6
Departmental Requirements ⁵		
PHYS 1111	Introductory Computational Physics	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3
Select an additional 6 credits in physics or geophysics numbered 300 or above		6
<i>Advanced Laboratory</i>		
Select 3 credits from the following:		3
PHYS 471	Modern Experimental Optics	
PHYS 475	Advanced Laboratory Practices for Materials	
PHYS 493	Experimental Nuclear Physics	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) ⁵		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
Select one of the following:		8
CHEM 1215G & CHEM 1225G	General Chemistry I Lecture and Laboratory for STEM Majors and General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 1216 & CHEM 1226	General Chemistry I Lecture and Laboratory for CHEM Majors and General Chemistry II Lecture and Laboratory for CHEM Majors	
Second Language Requirement: (required - see below)		0-8
Electives, to bring the total credits to 120 ^{5,6}		6-15
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
- ³ See alternatives for meeting General Education requirements.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses
- ⁵ May not be taken S/U and must earn a grade of C- or better.
- ⁶ Approved physics and technical electives are decided by Physics Advisors.

Students who plan to pursue graduate study in physics or geophysics are strongly advised to take one or more senior-level courses in optics, nuclear physics, space physics, condensed matter physics, geophysics, or computational physics. Students who plan to seek employment at the B.S. level are advised to select one of the following emphasis areas: Applied Physics, Computational Physics, Geophysics, Materials Science, or Optics. The program of study should be chosen by the student in consultation with a Physics Advisor. Some recommended courses are listed below.

Applied Physics: 12 credits of upper division E E, M E, or C S courses;

Computational Physics: C S 111, C S 171G, MATH 1531, and PHYS 476;

Geophysics: GEOL 1110G, GPHY 450, and two upper-division GPHY/GEOL courses;

Materials Science: 12 credits of upper-division courses selected from CHME 361, PHYS 450, PHYS 471, PHYS 475, PHYS 488, and PHYS 489.

Second Language Requirement

For the Bachelor of Science in the Physics there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	8
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
<i>For Heritage Speakers:</i>		
SPAN 1220 or SPAN 2210	Spanish for Heritage Learners II Spanish for Heritage Learners III	3
PORT 1110 or PORT 1120	Portuguese I Portuguese II	3

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		

SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
CHIN 1120	Mandarin Chinese II	4
or FREN 1120	French II	
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
<i>OR</i>		
Challenge the 1110/1120/1220/2210 level for the following courses:		
PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Dual Degree (BS/MS) Program

This program option is designed to provide a means for PHYS undergraduates to obtain both a BS and an MS degree with 138 credits (normally: BS=120 credits, MS=30 credits). Students electing this option will follow the regular undergraduate BS in physics curriculum, except that they take the advanced laboratory course at the 5XX level to meet their BS requirements. They also apply nine other credits of their undergraduate courses numbered 450 and higher towards their MS degree, requiring only an additional 18 credits for the MS. These 18 credits can be obtained in two semesters (and perhaps one summer term to write and defend an MS thesis). Students interested in this dual degree must be admitted to the MS in Physics graduate program and must fulfill all degree requirements for the MS in Physics.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for

students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester.

First Year		Credits
ENGL 1110G	Composition I ¹	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
PHYS 1111	Introductory Computational Physics ¹	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ¹	4
PHYS 2111	Supplemental Instruction to PHYS 2110 ¹	1
ENGL 2210G	Professional & Technical Communication ¹	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ¹	4
PHYS 2141	Supplemental Instruction to PHYS 2140 ¹	1
Area IV: Social and Behavioral Science Course ²		3
Credits		31
Second Year		Credits
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors ¹ or General Chemistry I Lecture and Laboratory for CHEM Majors	4
MATH 2530G	Calculus III ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4
PHYS 2121	Supplemental Instruction to PHYS 2120	1
COMM 1115G	Introduction to Communication	3
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors ¹ or General Chemistry II Lecture and Laboratory for CHEM Majors	4
MATH 392	Introduction to Ordinary Differential Equations ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 316	Supplemental Instructions to PHYS 315	1
PHYS 325	Intermediate Experimental Physics ¹	3
Area V: Humanities Course ²		3
Credits		32
Third Year		Credits
Semester 2		Credits
PHYS 451	Intermediate Mechanics I ¹	3
PHYS 461	Intermediate Electricity and Magnetism I ¹	3
PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
VWW - Viewing a Wider World Course(s) ³		6
First Course in Second Language Series		3-4
PHYS 462	Intermediate Electricity and Magnetism II ¹	3
PHYS 480	Thermodynamics ¹	3
Area VI: Creative and Fine Arts Course ²		3
Next Course in Second Language Series ¹		3-4
Credits		30-32
Fourth Year		Credits
PHYS 454	Intermediate Modern Physics I ¹	3
Physics/Geophysics Upper-Division Elective Course ¹		6
Advanced Physics Lab (or Elective) Course ¹		6
Elective Course		9-12

PHYS 455	Intermediate Modern Physics II ¹	3
Credits		27-25
Total Credits		120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Physics - Undergraduate Minor

A student cannot earn a BA or a BS in Physics and a minor in Physics. The minor in Physics requires a minimum of 18 credits distributed as follows:

Prefix	Title	Credits
Requirements		
PHYS 2110 or PHYS 1310G	Mechanics Calculus -Based Physics I	3
PHYS 2140 or PHYS 1320G	Electricity and Magnetism Calculus -Based Physics II	3
PHYS 315	Modern Physics	3
Select 3-9 credits from the following:		3-9
PHYS 2120	Heat, Light, and Sound	
Other Physics or Geophysics courses numbered 300 or above		
Select 0-6 credits from the following: ¹		0-6
A E 362	Orbital Mechanics	
C E 301	Mechanics of Materials	
CHME 361	Engineering Materials	
CHME 470	Introduction to Nuclear Energy	
CHME 471	Health Physics	
CHEM 431 or CHEM 431 H	Physical Chemistry Physical Chemistry Honors	
CHEM 433 or CHEM 433 H	Physical Chemistry I Physical Chemistry I Honors	
CHEM 434	Physical Chemistry II	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
E E 479	Lasers and Applications	
M E 333	Intermediate Dynamics	
M E 338	Fluid Mechanics	
M E 340	Applied Thermodynamics	
Total Credits		18

¹ Other courses may be chosen with the approval of the Physics department head.

Psychology Undergraduate Program Information

Students may take a major in psychology either as an area of emphasis in a liberal arts program or in preparation for further graduate education leading to professional careers in psychology. A major in psychology may be appropriate for the liberal arts student who wishes to pursue a

career involving extensive social interaction and requiring solutions to people-related problems. Such careers include law, business, parenting, government, education, and management. Professional careers in psychology generally require some post-baccalaureate education. These careers include provision of clinical and counseling services, conducting research, applying research findings in industrial or government settings, and doing teaching and research in colleges and universities. All students, but especially those planning to apply to graduate school, are encouraged to take PSYC 310 Experimental Methods, no later than the Spring semester of their junior year.

Requirements for the Bachelor of Arts in Psychology are listed here (p. 830). Satisfying these requirements should provide an adequate exposure to psychology for the liberal arts student and a basic foundation for students seeking a career in psychology. Students wishing to prepare for a professional career in psychology are especially encouraged to work closely with an advisor, as early as possible.

Graduate Program Information

Admission

The Department of Psychology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. To maximize consideration for admittance, candidates should submit applications by January 15. Note that the Psychology Department does not offer training in counseling or clinical psychology.

Students will be admitted to graduate study on the basis of their potential for achievement in research, scholarship and teaching. The most promising applicants will be accepted. The number of students that the department can successfully accommodate is limited, therefore it will not always be possible to admit all qualified applicants. The admissions committee will consider any material that a candidate for admission wishes to present.

Students with bachelor degrees should apply for admittance to the master's program even if their eventual goal is a Ph.D. Students with a master's degree in psychology-related disciplines or from other institutions may apply directly to the Ph.D. program.

A completed Graduate School admission application (<https://apply.nmsu.edu/apply/>) (online only) should include all of the following:

1. Complete transcripts of all college work (minimum 3.0 GPA).
2. Three letters of recommendation from professors, employers or others qualified to evaluate your potential for graduate work.
3. A letter explaining your research interests and experience, career goals, and an indication of the faculty member(s) whose work is of particular interest to you.
4. A curriculum vitae or résumé.
5. A writing sample (e.g., a paper you wrote for a course, a senior thesis, or a master's thesis) uploaded through online application system. Ideally, the sample should demonstrate your ability to write clearly about psychological research.

As per NMSU Graduate School policy, admission to the doctoral program is conditional upon passing a qualifying exam. In Psychology this generally involves giving a presentation about a completed, empirical Masters thesis project to an examining committee. Also, If there are perceived gaps in preparedness, once at NMSU, candidates may be asked to complete certain coursework/research projects to address deficiencies.

A number of potential minors are available to interested students, including a minor in statistics (p.). Additional information about a minor may be found in the listing of the home department in this catalog.

Degrees for the Department

Bachelor Degree(s)

- Psychology - Bachelor of Arts (p. 830)
- Psychology - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/psychology-ba-online/>)

Master Degree(s)

- Experimental Psychology - Master of Arts (p. 144)

Doctoral Degree(s)

- Experimental Psychology - Doctor of Philosophy (p. 192)

Minors for the Department

- Psychology - Graduate Minor (p. 218)
- Psychology - Undergraduate Minor (p. 832)

Andrew R. A. Conway, Department Head

Professors Conway, MacDonald, Madson, Marks, Trafimow **Associate Professors** Guynn, Hout, Ketelaar, Kroger, Papesh, Simon; **Assistant Professors** Fraune; **Emeritus Faculty** Cowie, Johnston, McDonald, Paap, Schvaneveldt, Stephan, Thompson.

A. R. A. Conway, Ph.D. (South Carolina) - human intelligence, cognitive abilities; M. Fraune, Ph.D. (Indiana)- Human/Robot Interaction; M. J. Guynn, Ph.D. (New Mexico)- human memory; M.C. Hout, Ph.D. (Arizona State) - visual cognition; T. Ketelaar, Ph.D. (Michigan)- social psychology, emotion; J. K. Kroger, Ph.D. (California-Los Angeles)- biopsychology, cognitive neuropsychology; J. MacDonald, Ph.D (Purdue)- engineering psychology, auditory perception; L.J. Madson, Ph.D. (Iowa State)- scholarship of teaching & learning, gender, sexuality; M.J. Marks, Ph.D. (Illinois, Urbana-Champaign)- social psychology, sexual behaviors, relationships; M. Papesh, Ph. D. (Arizona State) - cognition, neuroscience, and pupillometry; D.A. Simon, Ph.D. (California- Los Angeles)- cognition, learning and performance; D. Trafimow, Ph.D. (Illinois, Urbana-Champaign)- social cognition.

Psychology Courses

PSYC 1110G. Introduction to Psychology 3 Credits (3)

This course will introduce students to the concepts, theories, significant findings, methodologies, and terminology that apply to the field of psychology.

Learning Outcomes

1. Explain how the scientific method and psychological research methodologies are used to study the mind and behavior.
2. Recall key terms, concepts, and theories in the areas of neuroscience, learning, memory, cognition, intelligence, motivation and emotion, development, personality, health, disorders and therapies, and social psychology.
3. Explain how information provided in this course can be applied to life in the real world.
4. Identify the major theoretical schools of thought that exist in psychology as they relate to the self, the culture, and the society.

PSYC 2110. Social Psychology**3 Credits (3)**

This course is an introduction to the scientific study of human social influence and interaction, and explores how an individual's actions, emotions, attitudes and thought processes are influenced by society and other individuals. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Identify concepts, theories, scientific methods, and research findings relevant to social psychology.
2. Explain how situational, social, and individual factors influence behavior.
3. Apply social psychological concepts to real-life events, current social issues and problems, and one's own life.

PSYC 2120. Developmental Psychology**3 Credits (3)**

Study of human physical and psychological change and stability from a lifespan development perspective. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Explain theories, methods and research findings of lifespan developmental psychology.
2. Describe the interaction between physical, cognitive, and psychosocial development across the lifespan.
3. Compare and contrast major developmental theories and discuss what each brings to or adds to the study of lifespan developmental psychology.
4. Identify factors that influence psychological development across the lifespan.
5. Apply basic principles of developmental psychology to one's own life experiences.
6. Analyze historical and cultural factors that influence development across the lifespan.

PSYC 2210. Abnormal Psychology**3 Credits (3)**

This course provides students with an introduction to the field of abnormal psychology. Subject areas include history, methods, theories, etiologies, classification and treatment of disorders. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215 and ENGL 1110G.

Learning Outcomes

1. Recognize terms used within the field of abnormal psychology.
2. Compare various methods for defining abnormal behavior.
3. Evaluate the development of classification systems that define "normal" and "abnormal" from historical, social, and cultural contexts.
4. Critically evaluate the symptoms and etiologies of mental health disorders in the current psychological diagnostic system.
5. Describe treatment modalities for mental health disorders.
6. Identify biological and psychological processes in mental health disorders.

PSYC 2220. Cognitive Psychology**3 Credits (3)**

The course provides an overview of human cognitive processes such as attention, perception, memory, language, categorization, decision-making, reasoning, and problem solving. Includes methods, theories, and applications. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Describe research findings in the major areas of human cognition.
2. Differentiate the research methods used to study the various topics in cognitive psychology.
3. Apply theories of cognition to the results of laboratory research.
4. Apply the research on cognitive psychology to topics in the real world.

PSYC 2221. Applied Psychology**3 Credits (3)**

Explanation of the psychological principles of everyday living.

Emphasizes motivation, learning of intelligent behavior, and applications of psychology to social issues. Community Colleges only.

Learning Outcomes

1. The objective of this course is to orient students to the personality characteristics, interpersonal competencies, ethical decision-making skills, and other professional traits associated with pursuing a career in a helping profession.
2. Identify the requirements for becoming a helping professional, characteristics of a skilled helper, and cultural factors that impact helping professionals
3. Explain your personal strengths and weaknesses as a potential helper.
4. Demonstrate appropriate helping strategies based upon the special characteristics of clients.
5. Compare the capabilities that individual, family, group, community, and online interventions offer you as a future helper.
6. Identify the ethical and legal issues that impact helping professionals
7. Analyze the potential impact of your future ethical and professional standards as a helping professional
8. Explain how your role as a helping professional is impacted by your professional affiliation and ethical principles
9. Analyze how worsening personal problems and increasing stress can impact the kinds and quality of our responses to life and the people around us.

PSYC 2230. Psychology of Adjustment**3 Credits (3)**

This course focuses on the individual's adjustment to society, and the application of psychological principles to the understanding of adjustment.

Learning Outcomes

1. Explain the internal and external factors associated with the psychology of adjustment.
2. Evaluate contributions from psychology to adjustment concepts and processes.
3. Describe the different explanations of how individuals adjust to their environments.
4. Describe how self-identities develop and how they affect relations with others.
5. Identify resources available for assistance with adjustment-related concerns.

PSYC 2311. A Study of Substance Abuse through Learning
3 Credits (3)

Physiological and psychological impact of drug use on human behavior. Emphasizes practical applications of intervention and prevention in the community. Community Colleges only.

Learning Outcomes

1. Through readings and discussions, students will be able to describe the role that gender, ethnicity, and age have in alcohol and drug use.
2. Through readings and discussions, students will be able to learn past and current perspectives of addiction.
3. Through readings, discussions and student presentations, students will be able to distinguish between different types of abuse-able drugs and be able to classify them.
4. Through readings, discussions, lectures and guest speaker's students will be able to describe the role of addiction and criminal behavior.
5. Through readings and discussions, students will be able to discuss the Models and Theories of Drug Dependence and Addiction.
6. Through readings, discussions and evaluation of case studies students will be able to discuss the definitions of Substance Abuse, Dependence Addiction.
7. Through readings and discussions, students will be able to acquaint themselves with the effects of Addictive Behavior on Family Systems.
8. Through readings discussions, students will be able to Discuss Disorders Co-Occurring with Substance Abuse
9. Through readings and community service learning outing, students will be able to discuss how important the concepts of Prevention, Intervention and Treatment in drug addiction.1
10. Through readings and community service learning outing students will be able to discuss Alcohol/Drug Recovery Treatment Relapse Prevention 1
11. Through completion of Service Learning and field assignment students will be able to discuss the role of AA/NA in Recovery Treatment. 1
12. Through attendance of a Drug Court Hearing students will be knowledgeable of the role of Drug Courts in prevention and treatment of drug addiction.

PSYC 301. Introduction to Psycholinguistics
3 Credits (3)

Psychological aspects of language, including linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as LING 301.

Prerequisites: PSYC 1110G and one of: MATH 1350G, MATH 2350G, or A ST 311; and PSYC 310 or consent of instructor.

PSYC 310. Experimental Methods
4 Credits (2+4P)

The basic skills of literature search, experimental design, research methodology, and research reporting are emphasized; includes laboratory.

Prerequisite(s): PSYC 1110G, and either MATH 1350G, MATH 2350G, or A ST 311.

PSYC 311. Advanced Research Seminar
4 Credits (2+4P)

Psychological research in conjunction with designing, conducting, writing, and presenting an independent research project. May also include various computer applications. Will discuss issues regarding application to graduate programs. Course should be taken no later than the first semester of senior year.

Prerequisite: PSYC 310.

PSYC 315. Emotion
3 Credits (3)

An overview of the past century of research on human emotion from William James to Antonio Damasio. Explores a cognitive science perspective on emotion that includes questions about developmental, physiological, and evolutionary aspects of emotion and an exploration of the proximate and ultimate functions of emotion. Topics range from understanding the feeling component of emotion to understanding the role of facial displays of emotion.

Prerequisite(s): PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 310 or consent of instructor.

PSYC 320. Learning
3 Credits (3)

Covers: habituation, Pavlovian conditioning, Thorndikian learning, stimulus generalization, transfer of training, and the learning and forgetting of related and unrelated material. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310.

Learning Outcomes

1. Recognize and distinguish between various learning situations, especially classical/Pavlovian and Instrumental learning and their many facets and applications.
2. Identify some of the key conditions necessary for learning to take place, and that may prevent learning from taking place – rather more nuanced than most intro psych books suggest.
3. Identify and evaluate different basic situations to suggest how learning might be structured to cause changes in behavior in both humans and other animals.

PSYC 321. Psychology of Personality
3 Credits (3)

Introduces personality theories and supporting research. Psychoanalytic, physiological, and behavioral theories as they apply to personality are examined. Focuses on normal personality functioning.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310.

PSYC 324. Sexual Behavior
3 Credits (3)

Examines viewpoints of the evolution, control and function of human sexual behavior. Includes human sexuality, reproduction, male-female conflicts and the social implications of sex. Prerequisites: PSYC 1110G, MATH 1215, and ENGL 1110G

PSYC 325. Health Psychology
3 Credits (3)

Life stress, surgical stress, coronary-prone behavior, biofeedback, pain control, psychosocial approaches to geriatrics and cancer, behavioral treatments for addictions, obesity, and interpersonal issues in health care.

Prerequisite: PSYC 1110G.

PSYC 330. Psychology and the Law**3 Credits (3)**

Discretionary practices in the judicial system including pretrial procedures, jury selection, jury decision making, eyewitness testimony, insanity, expert witnesses, and probation judgments.

Prerequisite: PSYC 1110G.

PSYC 359. Psychology of Gender**3 Credits (3)**

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: GNDR 359.

Prerequisite: PSYC 1110G.

PSYC 370. Special Topics**1-3 Credits**

May be taken under different subtitles announced in the Schedule of Classes for unlimited credit. May be repeated for a maximum of 12 credits.

Prerequisite: PSYC 1110G.

PSYC 375. Psychology and the Brain**3 Credits (3)**

An exploration of how the brain produces thinking, emotion, and behavior. May be repeated up to 3 credits.

Prerequisite(s): PSYC 1110G, MATH 1215 and ENGL 1110G.

PSYC 376. Evolutionary Psychology**3 Credits (3)**

This course introduces the student to the science of Evolutionary Psychology. In this class we will explore how evolutionary psychologists think about a variety of topics ranging from our capacity for (and appreciation of) art, emotions, and beauty to an exploration of the "design" of our minds in regards to mating, status striving, social behavior and cultural production.

Prerequisite(s): PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 310 or consent of instructor.

PSYC 380. Perception**4 Credits (4+4P)**

Primary emphasis on vision. Topics include measurement of sensations, development of visual-motor coordination, reading, speech perception, picture perception, illusions, 3-dimensional space, and causes and consequences of visual abnormalities.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310.

PSYC 383. Memory**3 Credits (3)**

Examines facets of human memory from the information processing viewpoint, including encoding, storage, and retrieval and memory-aiding techniques.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310 or consent of instructor.

PSYC 400. Research**1-3 Credits**

Individual research projects supervised by a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisites: PSYC 310 and consent of instructor.

PSYC 401. Directed Readings**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisites: PSYC 1110G and consent of instructor.

PSYC 402. Field Experience**1-3 Credits**

Working with preschool, juvenile delinquent, handicapped, aged, convict, or mentally ill. Approximately five hours scheduled work per week per credit. May be repeated to 6 credits.

Prerequisites: 6 psychology credits and consent of instructor.

PSYC 430. Human-Computer Psychology**3 Credits (3)**

Theories, methodologies, and data from psychology applicable to interface design, with an emphasis on construction and application of conceptual psychological models.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310 or consent of instructor.

PSYC 441. History & Systems of Psychology**3 Credits (3)**

History of the scientific study of the mind and behavior. Covers the historical origins of philosophical and scientific approaches to Psychology and the development of influential schools of thought in psychology from the Classical Period through the Modern Era.

Prerequisite: PSYC 1110G and PSYC 310.

Learning Outcomes

1. Apply knowledge of important historical events/figures in scientific psychology by demonstrating an ability to explain how past ideas/thinkers/events have shaped current theory and methodology in scientific psychology.
2. Explain key ideas and concepts in contemporary scientific psychology by demonstrating an ability to draw connections between our current understanding and earlier approaches to the study of the mind.
3. Generate sophisticated arguments/opinions regarding contemporary questions in scientific psychology by demonstrating an ability to frame questions that draw upon a sophisticated understanding of the history of scientific psychology, while also being able to distinguish between well-informed and naïve answers to those questions.

PSYC 442. Thinking**3 Credits (3)**

Research and theory pertaining to human thinking and problem solving. Effective problem-solving methods and common obstacles to problem solving are analyzed.

Prerequisites: PSYC 1110G and PSYC 310.

PSYC 450. Senior Thesis**3 Credits (3)**

A laboratory or field research project conducted under faculty supervision. Requires written research proposal, conduct of research, data analysis, and final written report. May be repeated for a maximum of 6 credits.

Prerequisites: PSYC 310, 6 additional psychology credits, consent of supervising faculty member, and junior or above standing.

PSYC 470. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

PSYC 507. Quantitative Methods in Psychology I**3 Credits (3)**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on distributions, probability and basic inferential statistics in Psychological research. Includes basics of Analysis of Variance (ANOVA) and Multiple Regression in Psychological research. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to recognize appropriate usage of, and be able to implement, basic statistical techniques: Central tendency, variability, z-scores, t-tests, ANOVA, correlation, two predictor regression.

PSYC 508. Quantitative Methods in Psychology II**3 Credits (3)**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on advanced ANOVA and Multiple Regression in Psychological research. May be repeated up to 3 credits.

Prerequisite(s): PSYC 507 or equivalent.

Learning Outcomes

1. Students will become familiar with situations and applications of advanced ANOVA techniques and Multiple Regression and Correlation.

PSYC 509. Quantitative Methods in Psychology III**3 Credits (3)**

Advanced quantitative methods as applied to research in Psychology. Topics may include: Multivariate techniques, advanced Bayesian analyses, Random walk modelling etc. May be repeated up to 3 credits.

Prerequisite(s): PSYC 507 or equivalent.

PSYC 510. Computer Methodology**3 Credits (3)**

Use of computers in psychological research with emphasis on developing experimental control programs.

PSYC 520. Learning**3 Credits (3)**

Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.

PSYC 522. Sensation and Perception**3 Credits (3)**

Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.

PSYC 523. Methods in Cognitive Psychology**3 Credits (3)**

Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems.

Prerequisite(s): PSYC 524 or consent of instructor.

PSYC 524. Cognitive Psychology**3 Credits (3)**

Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.

PSYC 527. Social Psychology**3 Credits (3)**

Current and traditional theories, research findings, and research methodologies of social psychology.

PSYC 529. Methods in Social Psychology**3 Credits (3)**

Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems.

Prerequisite(s): Graduate student in psychology or consent of instructor.

PSYC 540. History and Systems of Psychology**3 Credits (3)**

History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.

PSYC 547. Engineering Psychology**3 Credits (3)**

Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.

PSYC 550. Teaching of Psychology**3 Credits (3)**

This class serves both new and experienced teachers. It will help new teachers design and conduct a successful course and help experienced teachers improve their teaching.

PSYC 570. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes.

PSYC 590. Research Seminar in Psychology**1 Credit (1)**

Presentations on research by students, faculty, and guest speakers. May be repeated for credit.

PSYC 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

PSYC 599. Master's Thesis**1-15 Credits**

Thesis.

PSYC 600. Doctoral Research**1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

PSYC 698. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

PSYC 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

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Psychology - Bachelor of Arts

General Requirements

Students must complete all University degree requirements, which include: General Education requirements (p. 220), Viewing a Wider World requirements (p. 224), and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Select one from the following		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
<i>English Composition - Level 2</i>		
Select one from the following		3
ENGL 2210G	Professional & Technical Communication (Recommended)	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
Select one from the following (students may need to complete prerequisites) ¹		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
Select one of the following from Area III: Laboratory Sciences (4 credits)		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
<i>Area IV: Social/Behavioral Sciences Course</i>		
PSYC 1110G	Introduction to Psychology	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ²		
<i>Area V: Humanities</i>		3

Select any Area V: Humanities course, but one of the following PHIL courses is recommended:²

PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 1115G	Introduction to Philosophy	
PHIL 1140G	Philosophy and World Religions	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
Area VI: Creative and Fine Arts ²		3
General Education Elective ²		3-4
Viewing A Wider World ³		6

Departmental/College Requirements (some overlap with Gen Ed)

PSYC 1110G	Introduction to Psychology (this course will count towards the Area IV requirement above)	
Select one from the following:		3
PSYC 302	Abnormal Psychology	
PSYC 350	Developmental Psychology: Conception through Childhood	

<i>Research Methods</i>		
PSYC 310	Experimental Methods ⁴	4
PSYC 311	Advanced Research Seminar	4

Basic Mechanisms		
Select 3 credits from the following:		3
PSYC 301	Introduction to Psycholinguistics	
PSYC 375	Psychology and the Brain	
PSYC 376	Evolutionary Psychology	
PSYC 380	Perception	

<i>Acquisition and Use of Knowledge</i>		
Select 3 credits from the following:		3
PSYC 340	Cognitive Psychology	
PSYC 383	Memory	
PSYC 442	Thinking	

Understanding Behavior		
Select one from the following:		3
PSYC 315	Emotion	
PSYC 317	Social Psychology	
PSYC 321	Psychology of Personality	

Additional Electives⁵ 11

Non-Departmental Requirements (some overlap with Gen.Ed/VWW)

Philosophy course 300-level or above⁶ 3

Statistics Course requirement, can be completed with one of the following (all but A ST 311 will count towards Gen.Ed requirements)^{1, 7}

A ST 311	Statistical Applications
MATH 1350G	Introduction to Statistics
MATH 2350G	Statistical Methods

Introductory Biology requirement, can be completed with one of the following (all will count towards Gen.Ed requirements)⁸

BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory

Second Language: (required- see below) 13-15

Electives, to bring the total credits to 120⁹	31-35
Total Credits	120

¹ Either MATH 1350G Introduction to Statistics, MATH 2350G Statistical Methods is required for the degree but students may need to take any prerequisites needed to enter MATH 1350G or MATH 2350G first.

² See the General Education (p. 220) of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ PSYC 310 Experimental Methods: prerequisite of PSYC 1110G Introduction to Psychology and and either MATH 1350G, MATH 2350G, or A ST 311.

⁵ Additional electives to bring total credits in psychology to at least 34, with at least 24 of those 34 credits being upper division.

⁶ PHIL 346 Philosophy of Mind or PHIL 351 Philosophy of Science recommended

⁷ Students who are considering graduate study are strongly encouraged to take math classes beyond the minimum statistics course requirement.

⁸ A course that includes a laboratory is highly recommended, and is required if intended to satisfy Gen Ed Area III

⁹ Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Psychology there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120 & CHIN 2110 & CHIN 2120	Mandarin Chinese I and Mandarin Chinese II and Mandarin Chinese III and Mandarin Chinese IV	3-14
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14

PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
CHIN 2120	Mandarin Chinese IV	3
or FREN 2120	French IV	
or GRMN 2120	German IV	
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
<i>OR</i>		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4: Computer Science Track

Prefix	Title	Credits
C S 153	Python Programming I	3
C S 154	Python Programming II	3
C S 158	R Programming I	3
Under special circumstances, alternative combinations of CS courses may be approved by the Department Head		
Total Credits		9

Option 5: Math Track

Prefix	Title	Credits
MATH 1220G	College Algebra	3
MATH 1250G	Trigonometry & Pre-Calculus	4
MATH 1511G	Calculus and Analytic Geometry I	4
MATH 1521G	Calculus and Analytic Geometry II	4
Total Credits		15

Option 6:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 7:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 8:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 9:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 10:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1350G Introduction to Statistics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I ¹	4
Choose from one of the following:		3
MATH 1350G	Introduction to Statistics ¹	
MATH 2350G	Statistical Methods ¹	
A ST 311	Statistical Applications ¹	
PSYC 1110G	Introduction to Psychology	3
Area V: Humanities Course (recommend one of the following) ²		3
PHIL 1115G	Introduction to Philosophy	
PHIL 2230G	Philosophical Thought	
FYEX 1112	The Freshman Year Experience ²	3
COMM 1115G	Introduction to Communication	3
Choose from one of the following:		4
BIOL 1120G & BIOL 2110L	Human Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
First Course in Second Language Series		3-4
Area VI: Creative and Fine Arts Course ²		3
Elective Course		1
Credits		30-31

Sophomore

Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication ¹	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course ²		3-4
General Education Elective Course ²		3-4
Next Course in Second Language Series ¹		3-4
PSY Upper-Division (refer to degree requirements list) ¹		3
PSYC 310	Experimental Methods ¹	4
Next Course in Second Language Series (OR Elective Course if Second Language Requirement Fulfilled) ¹		3-4

Minor (or Elective) Courses		8
Credits		30-34
Junior		
PSYC 311	Advanced Research Seminar	4
Choose from one of the following PSYC Core Courses:		3
PSYC 302	Abnormal Psychology	
PSYC 350	Developmental Psychology: Conception through Childhood	
Choose from one of the following PSYC Basic Mechanics Courses:		3-4
PSYC 301	Introduction to Psycholinguistics ¹	
PSYC 375	Psychology and the Brain ¹	
PSYC 376	Evolutionary Psychology ¹	
PSYC 380	Perception ¹	
Next Course in Second Language Series (OR Elective Course if Second Language Requirement Fulfilled) ¹		3-4
VWW: Viewing a Wider World Course ³		3
Choose from one of the following PSYC Acquisition courses:		3-4
PSYC 340	Cognitive Psychology ¹	
PSYC 383	Memory ¹	
PSYC 442	Thinking ¹	
Choose from one of the following PSYC Behavior courses:		3
PSYC 315	Emotion ¹	
PSYC 317	Social Psychology ¹	
PSYC 321	Psychology of Personality ¹	
Upper-Division Minor (or Elective) Course ¹		3
Minor (or Elective) Course		3
Elective Course		2
Credits		30-33
Senior		
PSYC Upper-Division Elective Courses ¹		9
PHIL Upper-Division Elective Course ¹		3
Upper-Division Minor (or Elective) Course ¹		6
Viewing a Wider World Course ³		3
Elective Courses		9
Credits		30
Total Credits		120-128

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Psychology - Undergraduate Minor

A student must pass at least 18 credits in Psychology courses with grades of C- or higher, and at least 9 of those credits must be upper division. A student may not earn both a BA in Psychology and a minor in Psychology.

Theatre Arts

Undergraduate Program Information

With strong emphases in acting, musical theater, new works and design/technical theatre, the program prepares students for graduate study, life

in the profession, or a myriad of related job fields. Students gain practical experience through a wide array of courses designed to expose them to the varied aspects and job positions involved in theatrical production. Additional experience is gained via work on our public productions. The faculty is augmented by nationally-renowned guest theatre artists.

A minimum of 62 credits with a grade of C- or higher in theatre arts is required for the major. Theatre Arts does not require a second language.

Students enrolled in this department's major or minor may count credits in required applied courses toward their degrees beyond the normal maximum of 9 credits allowed in the College of Arts and Sciences. However, if a student changes the major or does not complete the requirements for the minor at the time of graduation, they may only count a maximum of 9 credits of the applied credits toward graduation.

Students preparing to teach in public schools may qualify for certification by completing the Bachelor of Science in Education degree with theatre arts as a teaching field. (See curricula in the College of Health, Education & Social Transformation (<https://hest.nmsu.edu/>) section).

At any time the Theatre Arts program may be undergoing curriculum changes. For the most up-to-date information about degree requirements please visit <https://theatre.nmsu.edu/> or visit the Theatre Arts Department at room 318 in the ASNMSU Center for the Arts Building on University Ave at Espina.

Degrees for the Department

- Theatre Arts (Musical Theatre) - Bachelor of Arts (p. 840)
- Theatre Arts - Bachelor of Arts (p. 838)

Minors for the Department

- Theatre Arts - Undergraduate Minor (p. 842)

Professor, Wil Kilroy, Department Head/Managing Director

Associate Professor: Lury **Assistant Professors:** Hamilton, Hermanson

Adjunct Professors: Mojica, Fredrickson **Emeritus:** Brunson,

Storm **Professional Staff:** Carruthers, Wilkinson, Wise **Office Staff:** White

Theatre Arts Courses

THEA 1110G. Introduction to Theatre

3 Credits (3)

This course provides an introduction to the study of theatre. Students will examine various components that comprise theatre, such as acting, directing, playwriting, dramaturgy, scenic and costume design, stagecraft, spectatorship, history, theory, and criticism.

Learning Outcomes

1. Define and discuss basic theater terms and concepts.
2. Discuss the fundamental elements of theatre, and the ways in which theatre differs from other art forms.
3. Analyze and critique the elements of a live theatrical production.
4. Identify and describe the roles of various theatre artists including actors, directors, playwrights, dramaturges, and designers.

THEA 1210G. Acting for Non-Majors

3 Credits (3)

This class gives non-majors experience in the depth and craft of the actor's art. Students will learn various terms, techniques, and practices of acting and will demonstrate their understanding in class. Through exercises and improvisations, partnered scenes, and group work, students will be better able to appreciate the work of others as they learn techniques of performing. May be repeated up to 3 credits.

Learning Outcomes

1. Develop fundamental physical, vocal, analytical, and imaginative skills for acting for the stage.
2. Apply fundamental techniques of voice and movement for the stage.
3. Apply principles of play text analysis to understand story, character, and meaning.
4. Gain a better understanding of an actor's approach to goals, tactics, and obstacles.
5. Engage in character creation and development while preparing and performing monologues and scenes.
6. Learn a common vocabulary to help discuss the process of acting.
7. Employ collaborative methods of work with a partner and in groups.
8. Observe and evaluate acting skills of other actors.
9. Increase verbal and physical communication skills which are applicable in any field. 1
10. Develop personal and social responsibility via group work, research and self-reflection. 1
11. Increase confidence and self-esteem via continuous presentations with supportive feedback.

THEA 1221. Beginning Acting

3 Credits (3)

Basic understanding of self-expression through a variety of physical exercises, improvisation, and character study, culminating in scene or monologue work. Restricted to: THTR majors.

Learning Outcomes

1. Apply a common vocabulary that serves as a foundation in acting for the theatre major and minor
2. Communicate effectively in front of an audience, applying learned concepts while exercising freedom and control of voice, body, and imagination
3. Analyze the written character and live performance
4. Provide objective feedback to your classmate's work as well as your own, that supports a greater understanding of our craft while building trust within the collaborative ensemble

THEA 1222. Stage Movement

3 Credits (3)

Physical techniques for the actor to develop kinesthetic awareness and skills in characterization, archetypes, and stage combat. Restricted to: THTR majors.

Learning Outcomes

1. To provide fundamental training in a variety of movement techniques which can be applied to both theatrical performance and physical communication in everyday life.
2. Observation and critical skills will be advanced through class participation and outside assignments
3. Class exercises are aimed at guiding participants to uncover their own creative expression, while working with efficient, healthy body alignment

THEA 1223. The Art of Theatre**3 Credits (3)**

This course introduces the variety and scope of theatre professions, the value and goals of the theatre major and an analysis of the art form from script to stage. Restricted to: Required for THTR majors majors.

Learning Outcomes

1. An overview of the history of theatre in the Western world
2. A general understanding of the artistic roles and functions within the theatre industry (including within NMSU Theatre as a model)
3. A strong preparation for independent in-depth script analysis and theatre critique

THEA 1310. Introduction to Costuming**3 Credits (3)**

This course introduces students to basic skills generally used in creating costumes for theatre. During the semester students will be introduced to the costume shop, equipment, supplies, and processes. They will learn the process of sewing a garment and running a stage production.

Prerequisite(s)/Corequisite(s): THEA 1310L. Restricted to: THTR majors.

Learning Outcomes

1. Demonstrate basic hand and machine sewing skills.
2. Use basic costume craft tools and techniques.
3. Analyze fabric selection for the stage.
4. Draft and use patterns.
5. Take body measurements for patterning and construct a costume from those measurements.
6. Combine interpersonal communication skills with costume construction skills.
7. Analyze a script for costume design purposes.
8. Build a garment.

THEA 1310L. Costume Craft Lab**1 Credit (1)**

Class members will assist in construction for productions in a studio environment.

Prerequisite(s)/Corequisite(s): THEA 1310.

Learning Outcomes

1. This laboratory class compliments THEA 1310: Costume Crafts.
2. It gives the student an opportunity to put into practice the skills learned in THEA 1310 as well as be introduced to and participate in the day-to-day operations of the Costume Shop.

THEA 1415. Running Crew I**2 Credits (1+2P)**

Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.

Learning Outcomes

1. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2221. Intermediate Acting: Scene Study and Monologues**3 Credits (3)**

Monologues and scene work, using character and script analysis.

Prerequisite(s):

Prerequisite(s): THEA 1221 or THEA 1210 with C- or above.

Learning Outcomes

1. Students will gain further insight into the craft of acting and the techniques and skills required to present a successful stage performance.
2. Via the presentation of varied scenes and monologues, students will be exposed to a variety of theatrical literature.
3. Via research, students will gain knowledge of successful actors, acting techniques, and career advice.

THEA 2222. Intermediate Acting for Non-Majors**3 Credits (3)**

A continuation of THEA 1210 with an emphasis on monologues, scenes and characterization. **Prerequisite(s):** THEA 1210

Learning Outcomes

1. Apply fundamental techniques of voice and movement for the stage.
2. Analyze a dramatic text and interpret a character and develop the skills necessary to score a script for character development.
3. Perform specific choices to create and perform goal-driven characters.
4. Demonstrate various physical and mental relaxation techniques.
5. Identify internal and external techniques to increase actor's emotional range.
6. Demonstrate sensory exercises and apply this technique to scene work.
7. Articulate and implement key terminology of modern acting techniques.
8. Develop and articulate a basic personal artistic process.
9. Demonstrate the ability to work cooperatively on a creative/interpretative project. 1
10. Begin to develop professionalism and development of a critical eye through practice giving and receiving peer feedback, adherence to deadlines, memorization, flexibility and coachability.

THEA 2310. Stagecraft**3 Credits (3)**

Student will explore basic skills for scenic designers and techniques of set construction for the stage, including building scenery, rigging, painting and properties.

Prerequisite(s)/Corequisite(s): THEA 2310L.

Learning Outcomes

1. Demonstrate a range of technical skills, which will qualify them to assist in the basic technical production of a play.
2. Demonstrate and apply how to safely and competently use hand tools, power tools, electrical, and electronic stage equipment.
3. Analyze the technical aspects of a play in performance.
4. Read and construct scenery from ground plans, elevations, and drawings.
5. Analyze a script from the perspective of a designer, artistic, and/ or technical director.

THEA 2310L. Stagecraft Laboratory**1 Credit (1)**

Class members will assist with construction for productions in a studio environment.

Prerequisite(s)/Corequisite(s): THEA 2310.

Learning Outcomes

1. History of scenic design and the development of present day stage design.
2. How to create and interpret basic scenic ground plans, elevations, and detail drawings.
3. To construct basic scenic structures to include flats and platforms.
4. Various techniques of scenic painting and decorating.
5. The installations of theatre lighting instruments and sound equipment.

THEA 2340. Introduction to Design**3 Credits (3)**

Introduction into our visual world via the language of designers, focusing on collaboration, creative thinking and presentation skills. The varied design professions in theatre and the performing arts will be explored.

Restricted to: Required of all THTR Majors.

Learning Outcomes

1. Apply design vocabulary and descriptions when speaking about design.
2. Identify design tools and make choices about where to use them.
3. Apply the foundation information in understanding how design tools work.
4. Apply correct terminology in assessing design and script analysis.
5. Read and understand some of the design documents commonly used in the industry.

THEA 2415. Running Crew II**1 Credit (1)**

Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.

Learning Outcomes

1. To provide students with "hands on" experience participating in being a member of a running crew on a theatrical production.
2. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2421. Vocal Production for the Actor**3 Credits (3)**

Exploration and development of the actor's vocal instrument, including relaxation, projection, diction and articulation.

Learning Outcomes

1. Apply concepts of alignment, relaxation, breath support, resonance, projection, and articulation for your personal and professional benefit.
2. Refine vocal 'problem solving' which will carry into your personal and professional life.
3. Apply vocal concepts to a variety of text in order to understand and appreciate your voice and its capabilities, both intellectually and sensorially.
4. Apply the vocal/speech tools consciously and behavior-ally, as an aid in the search for musicality of the voice in conjunction with truth and believability.

THEA 2993. Theatre Workshop I**0.5 Credits (.5)**

Required for all freshman and sophomore theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. This lab course is designed to create community via group meetings with your peers while providing a platform for our guest artists to present information regarding our profession.
2. As time allows, group discussions and sharing will further the sense of community and collaboration with your peers.
3. This forum also provides an opportunity to discuss and provide feedback for each production in the ASTC season.

THEA 2996. Theatre Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

Learning Outcomes

1. Varies

THEA 300. Theatre Workshop II**0.5 Credits (.5)**

Required for all junior and senior theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

THEA 303. Theatre History I**3 Credits (3)**

History of theatre and drama from ancient Greece to the English Renaissance.

THEA 304. Theatre History II**3 Credits (3)**

History of theatre and drama from the Restoration to the 20th century. May be repeated up to 3 credits.

THEA 305. Advanced Vocal Production**3 Credits (.3)**

Advanced exploration and development of the actor's vocal instrument. May be repeated up to 3 credits.

Prerequisite(s): THEA 2421.

THEA 306. Script Analysis**3 Credits (3)**

This class is designed to give you tools and specific processes to help you read and break down a text, so that you can make it come alive for audiences in the varied genres of theatre, film and animation.

Learning Outcomes

1. Determine the dramatic structure of a script
2. Write an analysis of a script for production
3. Verbally communicate an analysis of a script for production
4. Analyze a script from a specific perspective such as actor, director, designer, animator, etc.

THEA 307V. Society in Style: Fashion, History and Culture**3 Credits (3)**

History of clothing for theatrical purposes, origins and evolution of period clothing in relation to social, political, and aesthetic factors of different periods.

THEA 308. Creative Writing: Playwriting**3 Credits (3)**

Technique of one-act playwriting, and analysis of dramatic structure.

Crosslisted with: ENGL 308

Prerequisite(s): ENGL 1110G.

THEA 310. Styles in Acting**3 Credits (3)**

Analysis of differing styles of acting through scene work representing various time periods and genres. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: THEA 1221 or THEA 1210 with a C- or better.

THEA 311. Acting for Film and Television**3 Credits (3)**

Specific techniques of acting for the camera are explored via hands-on experiential learning and an introduction to the business of the TV/Film industry

Prerequisite(s): THEA 1221 or THEA 1210 or permission of instructor.

THEA 313. Improvisation**3 Credits (3)**

Long and/or short form improvisation techniques in addition to a variety of exercises exploring terminology, character work and the elements of comedy.

Prerequisite(s): THEA 1210 or THEA 1221.

THEA 315. Theatre in New York City**3 Credits (3)**

Students are introduced to the professional world of theatre via productions, speakers, and tours during this travel course. May be repeated up to 6 credits.

Learning Outcomes

1. To gain insight into professional theatre by viewing and reviewing Broadway productions in NYC.
2. To receive information about the business of theatre via guests who are theatre professionals.
3. To become familiar with job opportunities backstage via guided tours of professional theatre spaces in New York.

THEA 317. Musical Theatre**3 Credits (3)**

Acting class focused on developing and refining skills necessary for performing in musicals. May be repeated up to 9 credits.

Prerequisite(s): THEA 1221 or THEA 1210 with a C- or better.

THEA 321V. Modern European Drama**3 Credits (3)**

Masterworks of European drama from the 19th century to the present. Crosslisted with: ENGL 321V.

THEA 322. Dramatic Character**3 Credits (3)**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. May be repeated up to 3 credits. Crosslisted with: ENGL 322.

THEA 323. American Drama**3 Credits (3)**

Masterworks of American drama from the 20th century to the present. Crosslisted with: ENGL 323.

THEA 324. Singing for Musical Theatre**3 Credits (3)**

Students will gain an understanding of stronger vocal health, aural skills, and rehearsal practice strategies as they work on musical theatre singing techniques and performances including solos, duets and small groups, and a final public showcase.

Learning Outcomes

1. The ability to practice strong vocal habits in order to independently maintain vocal health.
2. Identify and utilize proper vocal warm-up techniques.
3. Display an improved level of music reading and aural awareness.
4. Analyze and break down a piece of theatrical music into components for focused learning.
5. Perform pieces of music theatre both individually and in a group with increased ease

THEA 329. Studies in Drama**3 Credits (3)**

Subtitles vary. Study of a group of related works of drama, theory, or theatre practice. Crosslisted with: ENGL 329 and FDMA 329.

THEA 330. Special Topics: Variable**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes.

Learning Outcomes

1. To gain knowledge and/or skill in a specialty area of theatre

THEA 334. Introduction to Stage Makeup**3 Credits (3)**

Basic principles of stage makeup: straight, character, and specialty. Includes study of various products, methods of application, and the effects of lighting on makeup.

THEA 337. Independent Study**1-3 Credits (1-3)**

Students propose and design their own course not covered through regular course offerings under the guidance of faculty. Consent of Instructor required. May be repeated up to 6 credits.

THEA 341. Scene Painting**3 Credits (3)**

Use of historical painting techniques in a project-driven classroom. Projects include 2-D and 3-D work, color mixing and theory, painting scenery, and the use of paint for effects.

Prerequisite(s): THEA 2310.

THEA 343. Costume Patterning**3 Credits (3)**

Basic techniques in the production of flat patterns for modern and period silhouettes including some draping techniques. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Advanced training in costume design; the ability to create an original pattern in order to be able to make a costume item that is original

THEA 345. Costume Practicum**1 Credit (1)**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Costume Shop. May be repeated up to 1 credits.

Prerequisite(s): THEA 1310.

THEA 346. Scenic Practicum**1 Credit (1)**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Scene Shop. May be repeated up to 2 credits. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): THEA 2310.

THEA 347. Lighting Practicum**1 Credit (1)**

A practical course intended to provide students hands-on experience executing theatrical lighting.

THEA 348. Running Crew III**1 Credit (1)**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

Prerequisite(s): THEA 1415.

THEA 349. Running Crew IV**1 Credit**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

Prerequisite(s): THEA 1415.

THEA 352. Costume Design**3 Credits (3)**

Basic principles of costume design, including script analysis, principles of design, drawing and painting.

THEA 353. Scene Design**3 Credits (3)**

Design for the performing arts. Basic design skills and projects to exercise those skills, history of design in the theatre and the designer's role in the production process. Final project includes a finished scene design.

Prerequisite: THEA 2310 or consent of instructor.

THEA 354. Sound Design**3 Credits (3)**

Hands-on training in theatrical sound design and implementation.

THEA 355. Lighting Design**3 Credits (3)**

Basic aspects of theatre lighting, including electricity, color theory, history, and types of lighting instruments.

THEA 356. Theatre Production**1-3 Credits**

Participation in the production of theatrical performances by stage managing, acting, designing, dramaturgy, or directing. May be repeated for a maximum of 6 credits. Graded S/U.

THEA 357. Computer Scenographics**3 Credits (3)**

Project-oriented course teaching basic computer modeling skills. Projects focus on the creation of communication tools designers use in the theatrical process. Students will develop portfolios of completed projects. Consent of instructor required.

Prerequisite(s): THEA 352, THEA 353, or THEA 355.

THEA 360. Creative Drama**3 Credits (2+2P)**

Methods of developing original dramatizations. Emphasis on curriculum problems and teaching techniques in elementary and secondary schools.

THEA 366. Summer Theatre**1-3 Credits**

Experience in professional or academic summer theatre. May be repeated for a maximum of 3 credits. Graded: S/U. Restricted to THTR majors.

Prerequisite(s): Consent of department head.

THEA 384. Stage Management**3 Credits (3)**

Study of stage management techniques and their application to play production. A working knowledge of union rules, and the procedure to facilitate these through proper communication skills.

THEA 395. Directing I**3 Credits (3)**

Study and application of basic stage directing techniques.

Prerequisite(s): THEA 1210 or THEA 1221.

THEA 408. Shakespeare I**3 Credits (3)**

Study in Shakespeare's early poems and plays. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

THEA 409. Shakespeare II**3 Credits (3)**

Study in Shakespeare's later plays. ENGL 408 is not a prerequisite.

Repeatable for up to six credits under different subtitles. Crosslisted with ENGL 409.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

THEA 410. Advanced Acting: Contemporary Methods**3 Credits (3)**

Acting techniques will be explored focusing on current trends in the profession, from Stanislavski, to Hagen to Meisner. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: THTR majors.

Prerequisite(s): THEA 1210 or THEA 1221.

THEA 414. Collaborative Theatre-Making**3 Credits (3)**

This course introduces students to the techniques, skills and practice of the collaborative creation of new theatrical material.

Prerequisite(s): THEA 1221.

THEA 417. Musical Theatre II**3 Credits (3)**

A continuation of THEA 317, allowing for more advanced musical theatre techniques.

Prerequisite(s): THEA 317.

THEA 430. Special Topics

1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

THEA 435. Directed Reading

1-3 Credits

Directed individualized studies. May be repeated for a maximum of 3 credits.

THEA 439. Senior Seminar

3 Credits (3)

Course preparing students for professions in and related to the theatre. Restricted to: THTR majors.

THEA 440. Senior Seminar Practicum

1 Credit (1)

Capstone course preparing students to apply knowledge of theatre arts toward advanced training or career objectives in the discipline. Consent of instructor required.

Prerequisite(s)/Corequisite(s): THEA 439. Restricted to THTR majors.

THEA 450. The Michael Chekhov Acting Intensive

3 Credits (3)

An intensive overview of the performance techniques attributed to Michael Chekhov, applied to theatrical scenes and presentations. May be repeated up to 6 credits. Consent of Instructor required.

THEA 535. Directed Study

1-3 Credits (1-3)

For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

Name: Wil Kilroy, Department Head

Office Location: ASNMSU Center for the Arts, Room 321

Phone: (575) 646-5122

Website: <https://theatre.nmsu.edu/>

Theatre Arts - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
Area II: Mathematics ^{1,2}		3-4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		10-11
Area III: Laboratory Science Course (4 credits) ¹		
Area IV: Social/Behavioral Sciences Course (3 credits) ¹		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Course (4 or 3 credits) ¹		
Area V: Humanities ¹		3

Area VI: Creative and Fine Arts		3
General Education Elective ¹		3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 1223	The Art of Theatre	3
THEA 2310 & 2310L	Stagecraft and Stagecraft Laboratory	4
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab	4
THEA 1415	Running Crew I	2
THEA 2993	Theatre Workshop I (.5 X 4 semesters) ⁴	2
THEA 2421	Vocal Production for the Actor	3
THEA 2415	Running Crew II	1
THEA 2340	Introduction to Design	3
THEA 300	Theatre Workshop II (.5 X 4 semesters) ⁴	2
THEA 303	Theatre History I (Offered in alternate years)	3
THEA 304	Theatre History II (Offered in alternate years)	3
THEA 345	Costume Practicum	1
THEA 346	Scenic Practicum	1
THEA 347	Lighting Practicum	1
THEA 348	Running Crew III	1
THEA 349	Running Crew IV	1
THEA 395	Directing I	3
THEA 439	Senior Seminar (Offered Fall only)	3
THEA elective courses		
Select one from the following:		3
THEA 306	Script Analysis	
THEA 307V	Society in Style: Fashion, History and Culture	
THEA 308	Creative Writing: Playwriting	
THEA 321V	Modern European Drama	
THEA 322	Dramatic Character	
THEA 323	American Drama	
THEA 329	Studies in Drama	
Select one from the following:		3
THEA 352	Costume Design	
THEA 353	Scene Design	
THEA 354	Sound Design	
THEA 355	Lighting Design	
Select 9 credits from THEA 300/400 level courses ⁵		9
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 ⁶		17-20
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Theatre majors must enroll in Theatre Workshop each semester. THEA 2993 Theatre Workshop I for freshmen and sophomores and THEA 300 Theatre Workshop II for juniors and seniors, 2 credits total for each course equaling a total of 4 credits.

⁵ Courses from this category must not duplicate selections above.

⁶ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor

coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Theatre Arts there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) ¹	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course ²		3-4
THEA 1221	Beginning Acting (C- or better) ³	3
THEA 1223	The Art of Theatre (Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course)	3
THEA 2993	Theatre Workshop I (C- or better)	0.5
Area IV: Social/Behavioral Sciences Course ²		3
Area V: Humanities Course ²		3
THEA 2310 & 2310L or THEA 1222	Stagecraft (C- or better in both; tech design take this 2nd semester; performers take Stage Movement) ³ or Stage Movement	3-4
THEA 1415	Running Crew I (C- or better)	2
THEA 2993	Theatre Workshop I (C- or better)	0.5
Elective Course ⁶		2
Credits		30-32

Sophomore		Credits
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab (C- or better in both) ³	4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 303	Theatre History I (C- or better)	3
THEA 2421	Vocal Production for the Actor (C- or better)	3
THEA 2415	Running Crew II (C- or better)	1
THEA 2340	Introduction to Design (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	

THEA 1222 or THEA 2310 <i>and</i> THEA 2310L	Stage Movement (C- or better; performers take Stagecraft and lab 2nd year, design/tech students take Stage Movement) or Stagecraft <i>and</i> Stagecraft Laboratory	3-4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 304	Theatre History II (C- or better)	3
THEA 345	Costume Practicum (C- or better)	1
THEA 347	Lighting Practicum (C- or better)	1
THEA 348	Running Crew III (C- or better)	1
Choose one from the following:		3
THEA 308	Creative Writing: Playwriting	
THEA 321V	Modern European Drama	
THEA 322	Dramatic Character	
THEA 323	American Drama	
THEA 329	Studies in Drama	
Credits		33-34

Junior		Credits
Area III: Laboratory Science Course ²		4
General Education Elective Course ²		3-4
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 346	Scenic Practicum (C- or better)	1
THEA 349	Running Crew IV (C- or better)	1
Viewing a Wider World Courses ⁵		6
THEA 395	Directing I (C- or better)	3
Choose one from the following:		3
THEA 352	Costume Design (C- or better)	
THEA 353	Scene Design (C- or better)	
THEA 354	Sound Design (C- or better)	
THEA 355	Lighting Design (C- or better)	
THEA Elective Course (Upper-Division) (C- or better)		3
THEA 300	Theatre Workshop II (C- or better)	0.5
Elective Courses ⁶		4
Credits		29-30

Senior		Credits
THEA 300	Theatre Workshop II (C- or better)	0.5
Area VI: Creative and Fine Arts Course ²		3
THEA Elective Courses (Upper-Division)(C- or better)		6
THEA 439	Senior Seminar (C- or better)	3
Elective Courses (Upper-Division) ⁶		9
THEA 300	Theatre Workshop II (C- or better)	0.5
Elective Courses ⁶		6
Credits		28
Total Credits		120-124

¹ MATH 1130G Survey of Mathematics is suggested for the degree but students may need to take any prerequisites needed to enter MATH 210G first or any other General Education Mathematics course.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ THEA 1221 Beginning Acting, THEA 2310 Stagecraft/ THEA 2310L Stagecraft Laboratory, THEA 1310 Introduction to Costuming/ THEA 1310L Costume Craft Lab can be taken in any order, but all five courses must be completed by the end of Year Two.

⁴ THEA 321V Modern European Drama will not count towards the Viewing a Wider World requirement

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Theatre Arts (Musical Theatre) - Bachelor of Arts

The Musical Theatre concentration is designed to provide students with training in musical theatre performance, including singing, dancing and acting.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>10-11</i>
<i>Area III: Laboratory Science Course (4 credits)</i> ¹		
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹		
<i>Either an Area III/IV: Laboratory Sciences or Social/Behavioral Course (4 or 3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		<i>3</i>
<i>Area VI: Creative and Fine Arts</i>		<i>3</i>
<i>General Education Elective</i> ¹		<i>3-4</i>
Viewing A Wider World ³		6
Departmental/College Requirements		
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 1223	The Art of Theatre	3
THEA 2310 & 2310L	Stagecraft and Stagecraft Laboratory	4
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab	4
THEA 1415	Running Crew I	2
THEA 2993	Theatre Workshop I (.5 X 4 semesters) ⁴	2
THEA 2421	Vocal Production for the Actor	3
THEA 2415	Running Crew II	1
THEA 2340	Introduction to Design	3
THEA 300	Theatre Workshop II (.5 X 4 semesters) ⁴	2
THEA 303	Theatre History I	3
THEA 304	Theatre History II	3
THEA 317	Musical Theatre	3
THEA 345	Costume Practicum	1
THEA 346	Scenic Practicum	1

THEA 347	Lighting Practicum	1
THEA 348	Running Crew III	1
THEA 349	Running Crew IV	1
THEA 395	Directing I	3
THEA 417	Musical Theatre II	3
THEA 439	Senior Seminar	3
Select one from the following:		3
THEA 306	Script Analysis	
THEA 308	Creative Writing: Playwriting	
THEA 321V	Modern European Drama	
THEA 322	Dramatic Character	
THEA 323	American Drama	
THEA 329	Studies in Drama	
Select one from the following:		3
THEA 352	Costume Design	
THEA 353	Scene Design	
THEA 354	Sound Design	
THEA 355	Lighting Design	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
DANC 2460	Dance for Musical Theatre	2
Select 4-6 credits from the following:		4-6
DANC 1130	Ballet I	
DANC 1150	Modern Dance I	
DANC 2130	Ballet II	
DANC 2150	Modern Dance II	
DANC 3130	Ballet III	
DANC 3150	Modern Dance III	
<i>Voice or Applied Music-Vocal</i> ⁴		<i>6</i>
MUSC 1992	Applied Music	
MUSC 2120	Major Ensemble	
MUSC 2993	Opera Workshop	
MUSC 351	Opera Workshop	
MUSC 361	Concert Choir II	
MUSC 363	Jazz Ensembles II	
THEA 324	Singing for Musical Theatre	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 ⁶		6-11
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Two of the required vocal credits may be in choral ensemble or opera workshop.

⁵ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Theatre Arts with a Concentration in Musical Theatre there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) ¹	3
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course ²		3-4
THEA 1221	Beginning Acting (Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course) ³	3
THEA 1223	The Art of Theatre (C- or better)	3
THEA 2993	Theatre Workshop I	0.5
Area III: Laboratory Science Course ²		4
Area IV: Social/Behavioral Sciences Course ²		3
THEA 2310 & 2310L	Stagecraft (C- or better) ³ or Stage Movement or THEA 1222	3-4
THEA 1415	Running Crew I (C- or better)	2
THEA 2993	Theatre Workshop I (C- or better)	0.5
Credits		29-31
Sophomore		
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab (C- or better in both) ³	4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 2415	Running Crew II (C- or better)	1
THEA 2421	Vocal Production for the Actor (C- or better)	3
THEA 2340	Introduction to Design (C- or better)	3
THEA 303	Theatre History I (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
THEA 1222 or THEA 2310 <i>and</i> THEA 2310L	Stage Movement (C- or better) or Stagecraft <i>and</i> Stagecraft Laboratory	3-4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 317	Musical Theatre (C- or better)	3
THEA 345	Costume Practicum (C- or better)	1
THEA 348	Running Crew III (C- or better)	1
DANC 2460	Dance for Musical Theatre (C- or better)	2
MUSC 1992	Applied Music (C- or better) ⁴	2
Credits		33-34

Junior

Area V: Creative and Fine Arts Course ²		3
Area V: Humanities Course ²		3
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 346	Scenic Practicum (C- or better)	1
THEA 347	Lighting Practicum (C- or better)	1
THEA 349	Running Crew IV (C- or better)	1
Choose one from the following:		3
THEA 306	Script Analysis	
THEA 308	Creative Writing: Playwriting	
THEA 321V	Modern European Drama	
THEA 322	Dramatic Character	
THEA 323	American Drama	
THEA 329	Studies in Drama	
MUSC 1992	Applied Music (C- or better) ⁴	2
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 304	Theatre History II (C- or better)	3
THEA 395	Directing I (C- or better)	3
THEA 417	Musical Theatre II (C- or better)	3
MUSC 1992	Applied Music (DANC Course Elective (C- or better)) ⁴	2
Elective Courses ⁸		2
Credits		28

Senior

Viewing a Wider World Courses ⁶		6
General Education Elective Course ²		3-4
DANC Course Elective Courses ⁷		4-6
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 439	Senior Seminar (C- or better)	3
THEA 300	Theatre Workshop II (Elective Course (Upper-Division))	0.5
Choose one from the following:		3
THEA 352	Costume Design (C- or better)	
THEA 353	Scene Design (C- or better)	
THEA 354	Sound Design (C- or better)	
THEA 355	Lighting Design (C- or better)	
Elective Courses (Upper-Division) ⁸		10
Credits		30-33
Total Credits		120-126

¹ MATH 1130G Survey of Mathematics is suggested for the degree but students may need to take any prerequisites needed to enter MATH 1130G first or any other General Education Mathematics course.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ THEA 1221 Beginning Acting, THEA 2310 Stagecraft/ THEA 2310L Stagecraft Laboratory, THEA 1310 Introduction to Costuming/ THEA 1310L Costume Craft Lab can be taken in any order, but all five courses must be completed by the end of Year Two.

⁴ Students must complete a total of 6 credits of THEA 324 Singing for Musical Theatre, MUSC 1992 Applied Music (2 credits can be fulfilled with MUSC 2120, MUSC 2993, MUSC 351, MUSC 361 Concert Choir II, or MUSC 368)

⁵ THEA 321V Modern European Drama will not count towards the Viewing a Wider World requirement

⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁷ **DANC Courses:** (be mindful of course prerequisites when registering)

- DANC 1130 Ballet I
- DANC 1150 Modern Dance I
- DANC 2130 Ballet II
- DANC 2150 Modern Dance II
- DANC 3130 Ballet III
- DANC 3150 Modern Dance III

⁸ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Theatre Arts - Undergraduate Minor

The Department of Theatre Arts has one minor in Theatre Arts. Students must pass a minimum of 18 credits in consultation with a theatre department faculty member. NOTE: 9 credits must be 300 level and above. THEA credits must earn grades of C- or higher to earn the minor. A student cannot earn both a BA in Theatre Arts and a minor in Theatre Arts.

College of Business

Dean - *Bryan Ashenbaum*

Interim Associate Dean (Academics) - *Daniel James*

Interim Associate Dean (Research) - *Mary Jo Billiot*

Mission of the College of Business

The College of Business transforms lives by providing highly respected programs, instruction and scholarly activities that drive economic, social, educational and community development for New Mexico's diverse population.

Requirements for the Bachelor Degrees

- Successful completion of the New Mexico General Education Requirements and NMSU Viewing a Wider World Courses.
- Successful completion of College of Business Requirements below and major requirements. For the Bachelor of Arts in Economics, see the Economics and International Business (p. 858) section for specific requirements.
- A minimum cumulative grade point average (GPA) of 2.0 in all courses taken at NMSU to meet lower and upper division business core and major requirements.
- All majors except Economics and International Business require a minimum cumulative GPA of 2.0 in all courses taken to meet the requirements of the major. For Economics and International Business majors, a minimum cumulative GPA of 2.5 is required for courses taken to meet the requirements for the major.
- A minimum of 50% of business credits required for a Bachelor of Accountancy or Bachelor of Business Administration degree or 18 business credits required for a Bachelor of Arts in Economics degree must be completed in the College of Business and a minimum of 12 credits required in the major must be completed in the College. See sections below for major-specific transfer criteria. A total of no

more than six credits of courses designated as 300E may be used to satisfy the required upper division business elective, the ECON/A ST elective, and electives in the major.

The only courses that may be taken on an S/U option by students in the College of Business are those designated S/U only, general electives outside the college, and up to 9 credits of HNRS courses used to fulfill General Education requirements.

Before taking upper-division courses (numbered 300 or above) offered by the College of Business, students must complete all lower-division course requirements with the required minimum grades or better.

Upper division business course credits completed more than ten years prior to the degree application will be reviewed by the course department head and dean (or a designee) to determine their continued suitability to satisfy current degree, major and minor requirements and learning objectives.

Course Requirements

Prefix	Title	Credits
General Education Requirements		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I Multilingual	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Science and Social/Behavioral Sciences Courses</i>		10
<i>Area III: Laboratory Science Course (4 credit) ²</i>		
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles (Business Core: Lower Division)	
ECON 2120G	Microeconomics Principles (Business Core: Lower Division)	
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		3
MATH 1430G	Applications of Calculus I	
Viewing a Wider World Courses ³		6
Foundation Requirements ⁴		
Choose one from the following (grade of C- or better required):		3

If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹

MATH 1350G	Introduction to Statistics (Foundation Requirement)	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning ⁵	3
or MGMT 344	Production and Operations Management	
or MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper division business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses ⁶		24-27
Electives, to bring the total credits 120		
Select additional credits to bring total degree credits to a minimum of 120 and upper division credits to 48. The number of general elective credits varies by student and major. ⁶		13-16
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ A description of the requirement and a listing of approved VWW courses can be found in this catalog under Required Courses (p. 220).

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Management - Project Supply Change majors may not use MGMT 470 Project Management in Organizations to satisfy this requirement since it is a requirement in the major; Accounting majors must take BCIS 485 Enterprise Resource Planning.

⁶ Major course credits and Elective credits vary based on the major chosen. Please see the departmental/major pages for specifics on the number of major and elective credits required: Economics (Bachelor of Arts) (p. 867); Accounting (p. 851); Economics (p. 869); Finance (p. 881); General Business (p. 892); Information Systems (p. 853); International Business (p. 873); Management (p. 889); Marketing (<https://business.nmsu.edu/academic-programs/undergraduate-programs/marketing-undergraduate.html>).

Associate in Prebusiness Degree

To complete the associate degree, 60 credits are required, including the General Education Requirements, College of Business Foundation and Business Core (lower division) requirements.

A minimum cumulative grade point average of 2.0 is also required. The last 15 credits towards the degree must be earned through the NMSU system.

Minors in Business

Minors are available in

- accounting
- advertising
- banking and financial planning
- business administration
- business law
- economics
- enterprise systems
- entrepreneurship and innovation
- finance
- information systems
- international business
- management
- marketing
- professional selling
- risk management and insurance

Students pursuing the Bachelor of Individualized Studies or the Bachelor of Applied Studies are not eligible for minors from the College of Business other than the minor in business administration. At least 12 credits of the minor must be completed at the NMSU College of Business.

Preprofessional Programs

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. The programs that are administered by the College of Business is Prelaw, it is also administered through the College of Arts and Sciences

Prelaw Students

Law schools will accept undergraduates who have earned bachelor's degrees in any major. Many prelaw students take some law courses in their undergraduate program. The College of Arts and Sciences supervises a Supplementary Major in Law and Society, which includes courses from a number of departments and several colleges. It is described under "Government" in the Arts and Sciences chapter. The College of Business offers a number of Business Law courses which can be found under the prefix BLAW in the course description chapter later in this catalog. The Department of Philosophy in the College of Arts and Sciences offers both a major and a minor in Justice, Political Philosophy, and Law that cultivates a reasoned understanding of law and legal institutions, as well as the moral theories that support the value and justice of these institutions. The description of this major is found under the description "Philosophy."

Because the practice of law often involves business-related problems, the majors in the college provide an excellent preparation for the prelaw student. The college has attorneys on the faculty who are available as advisors. Please contact the Finance Department for more information.

Transferring Business Courses

The Transfer Course Equivalency Search tool found at <https://miniapps.nmsu.edu/transfer/> serves as a *general guide* in evaluation of transfer courses. However, transferability and applicability to an NMSU business or accounting degree or minor is not guaranteed until review and approval by the College of Business. Generally, for an upper division business course taken elsewhere to fulfill the requirements of an upper division business "equivalent" course at NMSU, the transferring school must have been accredited by AACSB at the time the course was taken, or, if not, have been regionally accredited and the course's content and rigor comparable to the "equivalent" course offered at NMSU. Transfer students are encouraged to contact the Associate Academic Dean in the College of Business for content and rigor review of potential upper division transfer courses prior to or shortly after enrollment at NMSU.

Associate Degree

- Prebusiness - Associate in Prebusiness (p. 845)

Bachelors Degrees

A

- Accounting - Bachelor of Accountancy (p. 851)

E

- Economics (Energy Economics) - Bachelor of Business Administration (p. 871)
- Economics (Energy Economics) - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-energy-economics-bba-online/>)
- Economics - Bachelor of Arts in Economics (p. 867)
- Economics - Bachelor of Business Administration (p. 869)

F

- Finance (Banking and Financial Planning) - Bachelor of Business Administration (p. 882)
- Finance (Entrepreneurial Finance) - Bachelor of Business Administration (p. 883)
- Finance (Financial Analyst) - Bachelor of Business Administration (p. 885)
- Finance (Risk Management and Insurance) - Bachelor of Business Administration (p. 886)
- Finance - Bachelor of Business Administration (p. 881)

G

- General Business (Entrepreneurship) - Bachelor of Business Administration (p. 894)
- General Business - Bachelor of Business Administration (p. 892)
- General Business - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/general-business-bba-online/>)

I

- Information Systems - Bachelor of Business Administration (p. 853)
- Information Systems - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/information-systems-bba-online/>)

- International Business - Bachelor of Business Administration (p. 873)

M

- Management (Human Resource Management) - Bachelor of Business Administration (p. 896)
- Management (Project & Supply Chain Management) - Bachelor of Business Administration (p. 898)
- Management (Small Business Management & Entrepreneurship) - Bachelor of Business Administration (p. 900)
- Marketing (Advertising) - Bachelor of Business Administration (p. 910)
- Marketing (PGA Golf Management) - Bachelor of Business Administration (p. 911)
- Marketing (Professional Selling) - Bachelor of Business Administration (p. 913)
- Marketing (Strategic Marketing) - Bachelor of Business Administration (p. 915)
- Marketing - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/marketing-bba-online/>)

Masters Degrees

A

- Accounting - Master of Accountancy (p. 89)
- Applied Statistics - Master of Science (p. 99)

B

- Business Administration (Agribusiness) - Master of Business Administration (p. 108)
- Business Administration (Finance) - Master of Business Administration (p. 110)
- Business Administration (Health Services Management) - Master of Business Administration (p. 111)
- Business Administration (Health Services Management) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-health-services-mgt-mba-online/>)
- Business Administration (Information Systems) - Master of Business Administration (p. 113)
- Business Administration (Information Systems) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-information-systems-mba-online/>)
- Business Administration (Public Utility Regulations) - Master of Business Administration (p. 114)
- Business Administration (Public Utility Regulations) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-public-utility-regulations-mba-online/>)
- Business Administration - Master of Business Administration (p. 106)
- Business Administration - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-mba-online/>)

E

- Economics (Econometrics) - Master of Arts (p. 128)
- Economics (Econometrics) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-econometrics-ma-online/>)
- Economics (Public Policy) - Master of Arts (p. 128)
- Economics (Public Policy) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-public-policy-ma-online/>)
- Economics (Public Utility Policy and Regulation) - Master of Arts (p. 129)
- Economics (Public Utility Policy and Regulation) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-public-utility-policy-regulation-ma-online/>)
- Economics - Master of Arts (p. 127)
- Economics - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-ma-online/>)

Doctoral Degrees

A

- Applied Statistics - Doctor of Philosophy (p. 174)

B

- Business Administration (Management) - Doctor of Philosophy (p. 180)
- Business Administration (Marketing) - Doctor of Philosophy (p. 180)

E

- Economic Development - Doctor of Economic Development (p. 183)

Graduate Certificates

- Finance - Graduate Certificate (p. 207)
- Public Utility Regulation and Economics - Graduate Certificate (p. 209)
- Public Utility Regulation and Economics - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-utility-regulation-economics-gr-certificate-online/>)

Undergraduate Minors

- Accounting - Undergraduate Minor (p. 856)
- Advertising - Undergraduate Minor (p. 917)
- Business Administration - Undergraduate Minor (p. 846)
- Business Law - Undergraduate Minor (p. 888)
- Economics - Undergraduate Minor (p. 876)
- Enterprise Systems - Undergraduate Minor (p. 856)
- Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor (p. 888)
- Finance - Undergraduate Minor (p. 888)
- Information Systems - Undergraduate Minor (p. 856)
- International Business - Undergraduate Minor (p. 876)
- Management - Undergraduate Minor (p. 902)
- Marketing - Undergraduate Minor (p. 917)

- Professional Selling - Undergraduate Minor (p. 917)
- Risk Management and Insurance - Undergraduate Minor (p. 888)

Graduate Minors

- Applied Statistics - Graduate Minor (p. 212)
- Economics - Graduate Minor (p. 213)
- Information Systems - Graduate Minor (p. 215)

Accreditation

New Mexico State University has been accredited since 1926 by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools as a degree-granting institution. The university was accredited in 1954 by the American Association of University Women.

The baccalaureate and graduate degree programs in business and accounting offered in the College of Business are accredited by AACSB International—The Association to Advance Collegiate Schools of Business.

Prebusiness - Associate in Prebusiness

Students must complete all University degree requirements, which include: General Education requirements and elective credits to total at least 60 credits. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
Area I: Communications		
English Composition Level I		
ENGL 1110G	Composition I ²	4
English Composition Level II		
ENGL 2210G	Professional & Technical Communication ²	3
Oral Communication		
COMM 1115G or COMM 1130G	Introduction to Communication ² Public Speaking	3
Area II: Mathematics		
MATH 1220G	College Algebra ^{1, 2}	3
Areas III/IV: Laboratory Science and Social/Behavioral Sciences		
ECON 2110G	Macroeconomic Principles ²	10
ECON 2120G	Principles of Microeconomics ²	
Select one course from Area III: Laboratory Science (4 credits) ³		
Area V: Humanities		
Select one course from Area V: Humanities. ³		3
Area VI: Creative/Fine Arts		
Select one course from Area VI: Creative/Fine Arts ³		3
General Education Elective		
MATH 1430G	Applications of Calculus I ²	3
Program Requirements		
ACCT 2110	Principles of Accounting I ²	3
ACCT 2120	Principles of Accounting II ²	3
BCIS 1110	Introduction to Information Systems ²	3
BUSA 1110	Intro to Business ²	3
MATH 1350G	Introduction to Statistics ²	3

Electives, to bring the total credits to 60 ^{4,5}	13
Total Credits	60

¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

² A grade of C- or better is required.

³ See the General Education Section (p. 220) of the catalog for a full list of courses.

⁴ Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, A credit, double majors and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 60 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ Although only 60 credits, excluding developmental coursework, are required for the degree, depending on required developmental coursework and electives taken, total credits actually earned may exceed 60.

Business Administration - Undergraduate Minor

This minor is available to all bachelors degree seeking students, except those seeking the *Bachelor of Accountancy* and the *Bachelor of Business Administration* degrees. It is the only minor in Business open to students in the Bachelor of Applied Studies and the Bachelor of Individualized Studies. At least 12 of the credits for the minor must be completed in the NMSU College of Business.

Minor Requirements

Choose 18 credits of coursework from these business core courses: Nine of the credits must be at the upper division level.

Prefix	Title	Credits
<i>Lower Division</i>		
ACCT 2110	Principles of Accounting I ¹	
ACCT 2120	Principles of Accounting II ¹	
BCIS 1110	Introduction to Information Systems	
BUSA 1110	Intro to Business	
ECON 2110G	Macroeconomic Principles ¹	
ECON 2120G	Principles of Microeconomics	
<i>Upper Division</i>		
BCIS 338	Business Information Systems I	
BLAW 316	Legal Environment of Business	
BFIN 341	Financial Analysis and Markets ¹	
MGMT 309	Human Behavior in Organizations	
MKTG 303	Principles of Marketing	
MGMT 344	Production and Operations Management ²	
or MGMT 470	Project Management in Organizations	
or BCIS 485	Enterprise Resource Planning	

¹ Courses satisfy background knowledge requirements for the MBA program when completed with a B- grade or better.

² Only one course may be applied to this minor.

Notes: A minimum GPA of 2.0 is required in the coursework for the minor.

Several courses listed above have prerequisites. It is the responsibility of the student to determine course prerequisites and other registration requirements.

Accounting and Information Systems Undergraduate Program Information

The Bachelor of Accountancy degree is available to students choosing accounting as a major. The curriculum is designed to prepare you for the excellent opportunities that exist in public accounting practice and in business, government and nonprofit organizations. It is also appropriate for those who may choose to seek either the Master of Accountancy or the Master of Business Administration degree after graduation.

The Information Systems program has a focus on cyber security that prepares you for a variety of administrative and technical positions associated with the security of information systems. Potential employers include information system service organizations, public accounting/consulting firms, manufacturing and merchandising business, banks and other financial institutions, government and others that rely on information systems to support their business.

Graduate Program Information

The last two decades have witnessed a tremendous expansion in the knowledge base required for accounting professionals. The business environment has become increasingly complex, as evidenced by the growth in the body of national and international accounting and auditing standards, taxation, SEC and other regulatory requirements. The accountant must also be well versed in communications and analytical skills, computer-based information systems, professional ethics and global issues.

Neither the traditional four-year accounting program nor the MBA provides the educational breadth and depth necessary to fully prepare students for the demands now imposed by many accounting careers. The major objective of the Master of Accountancy (MAcc) program is to provide for these increased educational needs and to prepare students more adequately for careers as professional accountants in financial institutions, government, not-for-profit organizations and public practice. The program is designed to provide a technical and theoretical foundation in accountancy at the advanced level and yet allow the student to take courses to accommodate individual needs.

Degrees for the Department

Bachelor Degrees

- Accounting - Bachelor of Accountancy (p. 851)
- Information Systems - Bachelor of Business Administration (p. 853)
- Information Systems - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/information-systems-bba-online/>)

Master Degree

- Accounting - Master of Accountancy (p. 89)

Minors for the Department

- Accounting - Undergraduate Minor (p. 856)
- Enterprise Systems - Undergraduate Minor (p. 856)

- Information Systems - Graduate Minor (p. 215)
- Information Systems - Undergraduate Minor (p. 856)

Kevin Melendrez, Ph.D., Department Head

Professors Mora-Monge; **Associate Professors** Billiot, Clemons, Ewing, Joo, Melendrez, Shen; **Assistant Professors** Arslan, Fuqua, Park, Peters, Zhang; **College Assistant Professor** Hamilton, Mitchell, Shindi; **Emeritus Professor** Foster, Mills, Oliver, Scribner, Seipel, Tunnell

F. Arslan, Ph.D. (Texas - El Paso)- information systems; M. J. Billiot, D.B.A. (Mississippi State) C.P.A.-managerial and financial accounting; R. Clemons, Ph.D. (Texas A&M) C.P.A - taxation; R. Ewing, Ph.D. (Kentucky) C.P.A., C.M.A. - managerial accounting; T. Foster (emeritus), Ph.D. (Penn State); D. Fuqua, Ph.D. (New Mexico State) - supply chain optimization and big data predictive analytics; P. Hamilton, MBA (New Mexico State); T. Joo, Ph.D. (Arkansas) C.P.A - financial accounting and taxation; K. Melendrez, Ph.D. (Arizona)– financial accounting; S. Mills (emeritus), Ph.D. (Texas Tech) C.P.A.; P. Mitchell, MAcc (New Mexico State) C.P.A.; C. Mora -Monge, Ph.D. (Toledo) - supply chain management, information systems; J. Park, Ph.D. (LSU) - financial accounting and accounting information systems; U. Peters, Ph.D., (Baylor) - information systems; E. Scribner (emeritus), Ph.D.(Oklahoma State)- C.P.A.; C. Seipel (emeritus), Ph.D.(Oklahoma State)– C.P.A., C.F.E.; Z. Shen, Ph.D. (Case Western Reserve University) - information systems; R. Shindi, Ph.D. (New Mexico State) - human-computer interaction; L. Tunnell (emeritus), Ph.D. (Oklahoma State) C.P.A.; Y. Zhang, Ph.D. (Texas Tech) - financial accounting.

Accounting Courses

ACCT 101. Supplemental Instruction to ACCT 221

1 Credit (1)

Collaborative workshop for students in ACCT 221 – Financial Accounting. Course does not count toward departmental degree requirements. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

Corequisite(s): ACCT 221.

ACCT 200. A Survey of Accounting

3 Credits (3)

Emphasis on financial statement interpretation and development of accounting information for management. For engineering, computer science, and other non business majors. Community Colleges only.

Prerequisite: one C S course or consent of instructor.

ACCT 2110. Principles of Accounting I

3 Credits (3)

An introduction to financial accounting concepts emphasizing the analysis of business transactions in accordance with generally accepted accounting principles (GAAP), the effect of these transactions on the financial statements, financial analysis, and the interrelationships of the financial statements.

Learning Outcomes

1. Analyze business transactions, their effects on the financial statements and the interrelationships of the financial statements involving the following: Cash transactions; Receivables and Net Realizable Value; Operational Assets and Depreciation; Inventory; Current Liabilities; Long-term Liabilities
2. Define, identify and demonstrate the impact of adjusting entries on financial statements.
3. Explain and demonstrate the differences between cash and accrual basis accounting.
4. Define and identify generally accepted accounting principles.

ACCT 2120. Principles of Accounting II

3 Credits (3)

An introduction to the use of accounting information in the management decision making processes of planning, implementing, and controlling business activities. In addition, the course will discuss the accumulation and classification of costs as well as demonstrate the difference between costing systems.

Prerequisite(s): ACCT 2110.

Learning Outcomes

1. Identify the differences between financial and managerial accounting.
2. Illustrate the accumulation of costs in cost accounting systems.
3. Describe the basic elements of the budgeting process, its objectives and budget preparation.
4. Define and classify cost behavior.
5. Perform cost-volume-profit analysis for decision-making.
6. Perform differential (incremental) analysis for business decision making.
7. Explain the cause of the variance and its effect on the income statement.
8. Explain and demonstrate the difference between traditional costing and activity-based costing.

ACCT 301. Financial Accounting I

3 Credits (3)

Concepts, principles, and practices of financial accounting, stressing the determination of income and financial position. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 302. Financial Accounting II

3 Credits (3)

A continuation of ACCT 301.

Prerequisite(s): C- or better in ACCT 301.

ACCT 351. Accounting Systems

3 Credits (3)

Covers accounting information systems as processors of data for financial reporting and control of economic organizations.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 353. Cost Accounting

3 Credits (3)

The development and use of cost accounting information for inventory valuation, income determination, and cost control. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 403. Federal Taxation I

3 Credits (3)

Basic federal income tax laws; emphasis on determination of taxable income of individuals. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 451. Auditing Theory and Practices**3 Credits (3)**

Auditing standards, audit evidence, auditors reports and opinions, and professional responsibilities.

Prerequisite(s): ACCT 351 and C- or better in ACCT 302.

ACCT 455. Federal Taxation II**3 Credits (3)**

Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning.

Prerequisite(s): C- or better in ACCT 403 or consent of instructor.

ACCT 456. Accounting for Nonprofit Organizations**3 Credits (3)**

Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports.

Prerequisite(s): C- or better in ACCT 302.

ACCT 458. Accounting Data Analytics**3 Credits (3)**

Data Analytics in financial and managerial accounting and auditing. Restricted to: Accounting majors.

Prerequisite(s): C- or Better in ACCT 301, ACCT 302, and ACCT 351.

ACCT 460. Fraud Examination and Prevention**3 Credits (3)**

Covers business fraud as it is occurring in American society. Emphasis is on occupational fraud and financial statement fraud. Examines various types of fraud, its symptoms and effective investigation techniques. Effective fraud prevention measures are discussed throughout the course. Emphasizes case studies and the application of principles to actual fraud cases.

Prerequisites: a C- or better in ACCT 451 or concurrent enrollment.

ACCT 490. Selected Topics**1-3 Credits**

Current topics in accounting. Prerequisites vary according to the seminar offered. May be repeated for a maximum of 12 credits under different subtitles.

ACCT 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

ACCT 500. Concepts in Accounting**1 Credit (1)**

Development, interpretation, and use of accounting information for financing, investing, operating, and managerial decision making.

Prerequisite(s): Admitted to MBA program.

ACCT 503. Accounting for Managers**3 Credits (3)**

Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to MAcc students.

Prerequisite(s): B or better in both ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 510. Technical and Professional Communication for Accountants**3 Credits (3)**

Effective writing strategies for professional communications. Students will learn to write with a professional style and proper English usage and to work with a variety of technical and lay audiences. Emphasis on initiation, planning, composition, and evaluation of business and accounting workplace scenarios to develop communication skills used in a business environment. Restricted to: Master of Accountancy majors.

ACCT 530. Advanced Accounting**3 Credits (3)**

This course is designed to provide in-depth study of current financial accounting concepts related to business combinations, financial statement consolidations, and foreign currency transactions and translations. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 302 with a grade of C or better.

ACCT 544. Financial Statement Analysis and Valuation**3 Credits (3)**

Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Restricted to: Master of Accountancy majors.

Prerequisite(s): Acct 302; Graduate students only.

ACCT 550. Special Topics**3 Credits (3)**

Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting. Prerequisites vary according to topic being offered.

ACCT 551. Advanced Auditing Theory and Practice**3 Credits (3)**

Understanding and evaluating internal control in an EDP environment. Statistical sampling applications and current issues in auditing.

Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 451.

ACCT 555. Federal Tax Research**3 Credits (3)**

Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 403.

ACCT 559. Ethics and Professionalism in Accounting**3 Credits (3)**

Introduction to ethical reasoning, integrity, objectivity, independence, and professional accounting issues. Students will apply the concepts and theories to accounting-specific cases. Restricted to: Master of Accountancy majors.

Prerequisite(s): C or better in ACCT 451.

ACCT 560. Taxation of Corporations and Shareholders Advanced**3 Credits (3)**

Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 403.

ACCT 564. Financial Accounting Research**3 Credits (3)**

Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of Instructor required. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 302.

ACCT 570. Taxation of Partnerships**3 Credits (3)**

Taxation of partnership contributions and distributions, transfer of partnership interests, and allocations of partnership income. Also includes taxation of S corporations. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 403.

ACCT 580. Professional Accountancy**3 Credits (3)**

Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Restricted to: Master of Accountancy majors.

ACCT 598. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisite: consent of instructor.

ACCT 599. Master's Thesis**15 Credits**

Thesis.

Business Computer Systems

BCIS 1110. Introduction to Information Systems**3 Credits (3)**

Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communications, data analysis, information management and decision-making.

Learning Outcomes

1. Describe the social impact of information literacy and systems in relation to commerce, education, and personal activities.
2. Explain how to use the information resources legally, safely, and responsibly in relation to ethical, security, and privacy issues.
3. Evaluate bias, accuracy and relevance of information and its sources.
4. Use productivity tools for communications, data analysis, information management and decision-making.
5. Describe and use current information systems and technologies

BCIS 321. Introduction to Software Development and Programming**3 Credits (3)**

Computer algorithm development and programming logic in the context of business information systems using current programming environments. Includes program design, data types, data structures, control structures, arrays, and principles of object oriented programming.

Prerequisite(s): C- or better in BCIS 1110; and MATH 1215.

BCIS 338. Business Information Systems I**3 Credits (3)**

Application, design and use of computerized information systems in business environment.

Prerequisite(s): BCIS 1110 or consent of instructor.

BCIS 350. Information Systems Analysis and Design**3 Credits (3)**

An introduction to the analysis and design of secure information systems.

Prerequisite(s): Concurrently with BCIS 338 or consent of instructor.

BCIS 461. Business Analytics I**3 Credits (3)**

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Crosslisted with: BCIS 561.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 466. Business Analytics II**3 Credits (3)**

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Crosslisted with: BCIS 566.

Prerequisite(s): BCIS 461 or consent of the instructor.

BCIS 475. Database Management Systems**3 Credits (3)**

Design, development, and use of database management systems in the business environment.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 480. E-Commerce Security**3 Credits (3)**

Introduction to securing network-based applications from internal and external threats. Fundamentals of network security, including TCP/IP, firewalls, intrusion detection, and vulnerability.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 482. Management of Information Security**3 Credits (3)**

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 485. Enterprise Resource Planning**3 Credits (3)**

This course covers concepts in enterprise resource planning (ERP). Topics include how ERP integrates business processes across functional areas—such as the procurement process and the sales order process—and how businesses use ERP information systems in day-to-day operations as well as for performance monitoring. SAP R/3 software will be used in several hands-on examples of ERP software as a real-world example of an ERP system.

Prerequisite(s): C- or better in BCIS 338 or BCIS 350 or ACCT 351.

BCIS 490. Selected Topics**1-3 Credits**

Current topics in business systems analysis. Consent of Instructor required.

BCIS 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. May be repeated for a maximum of 3 credits.

Prerequisites: junior or above standing and consent of instructor.

BCIS 502. Business Information Systems**3 Credits (3)**

Analysis of information systems as integral parts of business organizations, including the responsibility of management to understand their capabilities and uses in handling the organization's information flow and providing appropriate information for decision making.

Prerequisite: graduate students only.

BCIS 550. Information Systems Analysis and Design**3 Credits (3)**

Information systems development methodologies and the system life cycle. Justifying and managing systems development projects. Not open to students who have taken BCIS 350. Students must be Graduate Students to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Describe foundations of systems development.
2. Explain systems development life cycle and key methodologies.
3. Depict how to conduct planning in systems development.
4. Determine and structure system requirements.
5. Apply principles and guidelines to design interfaces, forms and databases.
6. Understand the major issues in the systems implementation and maintenance.

BCIS 561. Business Analytics I**3 Credits (3)**

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Not open to students who have taken BCIS 461. No S/U or audit option.

Prerequisite: BCIS 338.

Learning Outcomes

1. Identify the reasons for and the evolution of computerized support in managerial decision making.
2. Describe the business intelligence (BI) methodology and concepts.
3. Identify and explain various types of analytics.
4. Explain the nature of data in the context of BI and Business Analytics.
5. Describe statistical modeling and its relationship to business analytics.
6. Apply descriptive and inferential statistics techniques.
7. Explain the importance of data/information visualization and apply different types of visualization techniques.
8. Explain the basic concepts of data warehousing.
9. Explain data integration and the extraction, transformation, and load (ETL) processes. 1
10. Describe the essence of business performance management (BPM). 1
11. Describe balanced scorecard and Six Sigma as performance measurement systems. 1
12. Explain the objectives and benefits of data mining. 1
13. Learn the standardized data mining process. 1
14. Enhance your communication (presentation and report writing), creative thinking, problem-solving, and analytical skills.

BCIS 566. Business Analytics II**3 Credits (3)**

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Not open to students who have taken BCIS 466. No S/U or audit option.

Prerequisite: BCIS 561.

Learning Outcomes

1. Identify and explain various types of analytics.
2. Define data mining as an enabling technology for business analytics.
3. Learn the standardized data mining processes and the different methods and algorithms of data mining.
4. Build working knowledge of the existing data mining software tools.
5. Describe text analytics and understand the need for text mining.
6. Learn the process of carrying out a text mining project and the common methods for sentiment analysis.

BCIS 575. Database Management Systems**3 Credits (3)**

Design, development, and use of database management systems in the business environment. Not open to students who have taken BCIS 475. May be repeated up to 3 credits.

Prerequisite: BCIS 350.

Learning Outcomes

1. Describe fundamental database terminology and explain the primary features of database management systems. (Cognitive Level: Understand)
2. Explain relational database concepts, such as primary key and referential integrity, normalization, and triggers. (Cognitive Level: Understand)
3. Explain what a data model is. (Cognitive Level: Understand)
4. Write SQL—the standard language of relational databases—at an advanced level. (Cognitive Level: Apply)
5. Design a data model and code/implement it as a database solution using SQL. (Cognitive Level: Create)
6. Describe the fundamental concepts of Data Warehouses. (Cognitive Level: Understand)
7. Design and build data warehouses. (Cognitive Level: Create)
8. Describe emergent database topics such as graph databases, big data, data lakes, NoSQL. (Cognitive Level: Understand)
9. Demonstrate how a database can be used with Python programming language and MS Excel. (Cognitive Level: Apply)

BCIS 580. E-Commerce Security**3 Credits (3)**

Introduction to securing network-based applications from both internal and external threats. Fundamentals of network security including TCP/IP, firewalls, intrusion detection and vulnerability discussed. Not open to students who have taken BCIS 480. No S/U or audit option. May be repeated up to 3 credits.

Prerequisite: C- or better in BCIS 460 or consent of instructor.

Learning Outcomes

1. Communication (COMM): Students are effective communicators; a) Students can write effectively. (write); b) Students can make effective oral presentations. (oral)
2. Diversity (DIVERSITY): Students can demonstrate knowledge of diversity; a) Students can identify stereotypes; b) Students can discern between helpful and detrimental stereotypes. c) Students can identify individual characteristics that affect social perception and strategies that counter negative influence on social perception.
3. Information Technology (TECH): Students are effective users of information technology; a) Students can acquire information using relevant information technologies; b) Students can use information technology to manipulate information into a form usable in business decision making; c) Students can use information technology to disseminate information to others.
4. Critical Thinking: Students can solve problems and think critically; a) Students can solve problems. (PROB SOLV); b) Students can think critically. (THINK)
5. Legal and Ethical: Students can recognize legal and ethical issues; a) Students can recognize legal issues. (LEGAL); b) Students can recognize ethical issues. (ETHICS)

BCIS 582. Management of Information Security**3 Credits (3)**

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Not open to students who have taken BCIS 482. May be repeated up to 3 credits.

Prerequisite: BCIS 1110 or equivalent.

Learning Outcomes

1. Explain the fundamental concepts of the management of information security within the context of organizations.
2. Describe commonly used information systems (IS) security standards and guidelines.
3. Create IS security management and policy as well as risk management plans.
4. Explain the behavioral aspects of IS security and discuss the development of security culture within organizations.
5. Explain the technical aspects of IS security, including issues related to cryptography and network security.
6. Describe and evaluate the regulatory aspects of information system security (primarily within the United States and European Union context).

BCIS 585. Enterprise Resource Planning & Business Processes**3 Credits (3)**

Enterprise-wide information systems and their use in enterprise resource planning (ERP). This course will examine the many cross-functional business processes. Other topics include ERP implementation issues, change management, and business process re-engineering. Hands-on exercises use SAP/3 Enterprise software. Not open to students who have taken BCIS 485. May be repeated up to 3 credits.

Prerequisite: C- or better in ACCT 351 or BCIS 502.

Learning Outcomes

1. Business processes common to most businesses, including order processing, procurement, inventory management, etc
2. How a business process often spans different functional areas of the business: accounting, marketing, etc.
3. How enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
4. Process modeling to depict the sequence of tasks completed in a business process.
5. Master data common to most businesses (e.g. customer, vendor, inventory, etc.).
6. The issues involved in implementing an ERP system.

BCIS 590. Special Topics**1-3 Credits (1-3)**

Seminars in selected current topics in business computer systems. May be repeated up to 3 credits.

Prerequisite(s): Vary according to topic being offered.

BCIS 598. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of department head. A maximum of 3 credits may be earned.

Prerequisite: consent of instructor.

Department of Accounting and Information Systems**Business Complex, Suite 232**

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Website: <https://business.nmsu.edu/departments/academic-departments1/accounting/dept-acc-info-sys.html>

Accounting - Bachelor of Accountancy

Every candidate for the Bachelor of Accountancy degree must fulfill the following requirements in addition to the General Education, Viewing a Wider World requirements, College of Business Foundation and the Business Core Courses, and Electives.

In order to count toward the Bachelor of Accountancy, upper-division transfer courses in accounting

1. must have been taken at an institution with AACSB Accounting accreditation or
2. be part of the New Mexico Business Articulation Matrix.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education Requirements		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ^{1,2}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
Grades of C- or better required for ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)	
<i>Area III: Laboratory Sciences (4 credits) ³</i>		
<i>Area V: Humanities ³</i>		
<i>Area VI: Creative and Fine Arts ³</i>		
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C-) ²	
Viewing a Wider World Courses ⁴		6
Departmental/College Requirements		
<i>Foundation Requirements ²</i>		
Choose one from the following (grade of C- or better required):		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3

MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning	3
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
ACCT 301	Financial Accounting I ⁵	3
ACCT 302	Financial Accounting II	3
ACCT 351	Accounting Systems	3
ACCT 353	Cost Accounting ⁵	3
ACCT 403	Federal Taxation I ⁵	3
ACCT 451	Auditing Theory and Practices	3
ACCT 458	Accounting Data Analytics	3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>ACCT Upper Division Electives</i>		3
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁶		13
Total Credits		120

- ¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G.
- ² All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II: General Education course or the General Education Elective requirements: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.
- ³ See the General Education (p. 220) section of the catalog for a full list of courses.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.
- ⁵ A student who does not pass ACCT 301 Financial Accounting I, ACCT 353 Cost Accounting, or ACCT 403 Federal Taxation I within three attempts will not be allowed to take the class for a fourth.
- ⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I ((for multicultural/international students only and a C- or better)) ¹	
Area V: Humanities Course ²		3
Elective Course		3

Credits 16

Spring

MATH 1430G	Applications of Calculus I ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3

Credits 16

Second Year

Fall		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better) ¹	
ECON 2110G	Macroeconomic Principles ((counts towards Area IV Gen.Ed and a C- or better)) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication ((counts towards Area I Gen.Ed, and a C- or better)) ¹	3
Elective Course		3

Credits 15

Spring

Elective Course		3
ECON 2120G	Principles of Microeconomics ((counts towards Area IV Gen.Ed, and a C- or better)) ¹	3
ACCT 2120	Principles of Accounting II (C- or better) ¹	3
Elective Course		4
VWW - Viewing a Wider World Course ³		3

Credits 16

Third Year

Fall		
ACCT 301	Financial Accounting I (C- or better) ¹	3
ACCT 351 or ACCT 353	Accounting Systems ^{1,4} or Cost Accounting	3
BCIS 338	Business Information Systems I ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3

Credits 15

Spring

ACCT 302	Financial Accounting II (C- or better) ¹	3
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Choose one from the following: ⁴ 3

ACCT 351	Accounting Systems ¹	
ACCT 353	Cost Accounting ¹	
ACCT 403	Federal Taxation I ¹	
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
VWW - Viewing a Wider World Course ³		3

Credits 15

Fourth Year**Fall**

Choose one from the following: ⁴ 3

ACCT 351	Accounting Systems ¹	
ACCT 353	Cost Accounting ¹	
ACCT 403	Federal Taxation I ¹	
ACCT 458	Accounting Data Analytics	
ACCT Upper Division Elective Course ^{1,5}		3
BCIS 485	Enterprise Resource Planning ¹	3
ECON or A ST Upper-Division Elective Course (excluding A ST 311)		3
Any Business Upper-Division Elective Course (excluding A ST 311)		3

Credits 15

Spring

ACCT 451	Auditing Theory and Practices ¹	3
ACCT Upper-Division Elective Course ^{1,5}		3
MGMT 449	Strategic Management	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3

Credits 12

Total Credits 120

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Students must take all four courses: ACCT 351 Accounting Systems, ACCT 353 Cost Accounting, ACCT 403 Federal Taxation I and ACCT 458 Accounting Data Analytics.

Students who does not pass ACCT 301 Financial Accounting I, ACCT 353 Cost Accounting, or ACCT 403 Federal Taxation I within three attempts will not be allowed to take the class for a fourth.

⁵ Graduate-Level Coursework Substitution: At the discretion of the Accounting Department and the Academic Dean of the Business College, qualified juniors/seniors may be allowed to enroll in graduate-level accounting courses to satisfy these requirements.

**qualified juniors/seniors who plan to pursue a Master of Accountancy should consult with the Master of Accountancy program coordinator for details about the requirements that must be met to qualify for early acceptance.*

Information Systems - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and business core (p. 842), Viewing a Wider World requirements and general electives.

Please note that some of the courses listed may have a prerequisite which would require a student to take an additional course. Substitutions for some of these courses may be considered if a student makes this request to the department.

Note: The Information Systems major is also offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs/> (<https://business.nmsu.edu/academic-programs/undergraduate-programs/online-undergraduate-program.html>)

Course Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)	
<i>Area III: Laboratory Sciences Course (4 credits)²</i>		
<i>Area V: Humanities²</i>		3
<i>Area VI: Creative and Fine Arts²</i>		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement)	3
Viewing a Wider World³		6
Departmental/College Requirements		
<i>Foundation Requirements⁴</i>		
Choose one from the following:		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		

MATH 1350G	Introduction to Statistics (Foundation Requirement)	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one from the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
BCIS 321	Introduction to Software Development and Programming	3
BCIS 350	Information Systems Analysis and Design	3
BCIS 461	Business Analytics I	3
BCIS 475	Database Management Systems	3
<i>Select 12 credits of Information Systems Electives</i>		12
BCIS 466	Business Analytics II	
BCIS 480	E-Commerce Security	
BCIS 482	Management of Information Security	
BCIS 490	Selected Topics	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 377	Computer Networking I	
ICT 477	Computer Networking II	
Second Language: (not required)		
Electives, to bring the total credits to 120⁵		16
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in

the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (for multicultural/international students only and a C- or better) ¹	
Area V: Humanities Course ²		3
Elective Course ³		3
Credits		16
Spring		
MATH 1430G	Applications of Calculus I ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16
Second Year		
Fall		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better) ¹	
ECON 2110G	Macroeconomic Principles (counts towards Area IV Gen.Ed and a C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication (counts towards Area I Gen.Ed, and a C- or better) ¹	3
Elective Course ³		4
Credits		16
Spring		
Elective Course ³		3
ECON 2120G	Principles of Microeconomics (counts towards Area IV Gen.Ed, and a C- or better) ¹	3

ACCT 2120	Principles of Accounting II (C- or better) ¹	3
VWW - Viewing a Wider World Course ⁴		3
BCIS 321	Introduction to Software Development and Programming	3
Credits		15
Third Year		
Fall		
BCIS 338	Business Information Systems I ¹	3
BCIS 350	Information Systems Analysis and Design ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
Information Systems Elective Course ^{1,5}		3
Credits		15
Spring		
BCIS 475	Database Management Systems ¹	3
Information Systems Elective Course ^{1,5}		3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
VWW - Viewing a Wider World Course ⁴		3
Credits		15
Fourth Year		
Fall		
BCIS 461	Business Analytics I	3
Information Systems Elective Course ^{1,5}		3
Choose one from the following:		3
BCIS 485	Enterprise Resource Planning ¹	
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations ¹	
ECON or A ST Upper-Division Elective Course (excluding A ST 311)		3
Elective Course ³		3
Credits		15
Spring		
Information Systems Elective Course ^{1,5}		3
Elective Course ³		3
MGMT 449	Strategic Management ¹	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
Credits		12
Total Credits		120

¹ These courses have prerequisites and it is the student's responsibility for checking and fulfilling all course prerequisites listed for these courses

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Information Systems Elective Courses:

- BCIS 466 Business Analytics II, BCIS 480 E-Commerce Security, BCIS 490 Selected Topics

- ICT 339 Introduction to Digital Forensics and Incident Response, ICT 377 Computer Networking I, ICT 477 Computer Networking II

Accounting - Undergraduate Minor

To obtain a minor in Accounting, a student must complete 18 or more credit hours of approved course work in Accounting (ACCT), of which at least 12 hours are in courses numbered 300, or higher. All courses for the minor must be completed with a grade of C- or better. At least 12 credits must be completed at NMSU.

This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
ACCT 301	Financial Accounting I	3
Select three from the following:		9
ACCT 302	Financial Accounting II	
ACCT 351	Accounting Systems	
ACCT 353	Cost Accounting	
ACCT 403	Federal Taxation I	
ACCT 451	Auditing Theory and Practices	
ACCT 455	Federal Taxation II	
ACCT 456	Accounting for Nonprofit Organizations	
ACCT 460	Fraud Examination and Prevention	
BCIS 485	Enterprise Resource Planning	
Total Credits		18

Of the 12 hours of upper-division Accounting classes required for the minor, a minimum of 6 must be taken at NMSU. At least 12 credit hours must be completed at the NMSU College of Business. To count toward the minor, upper-division transfer courses must have been taken at an institution with AACSB Accounting accreditation.

Enterprise Systems - Undergraduate Minor

To obtain a minor in Enterprise Systems, a student must complete 18 or more credit hours of approved course work. A cumulative grade point average of at least 2.0 over the 18 hours must be earned. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ACCT 351	Accounting Systems	3
BCIS 485	Enterprise Resource Planning	3
BCIS 482	Management of Information Security	3
BFIN 360	Financial Information Technology	3
Select one from the following:		3
MGMT 351	Supply Chain Management	
MGMT 344	Production and Operations Management	
Select one from the following:		3
ACCT 353	Cost Accounting	

MGMT 345V	Quality and Competitiveness: An International Perspective	
MGMT 470	Project Management in Organizations	
BFIN 475	International Managerial Finance	
Total Credits		18

Information Systems - Undergraduate Minor

To obtain a minor in Information Systems (IS), a student must complete 18 or more credit hours of approved coursework in IS. A cumulative grade point average of at least 2.0 over the 18 hours must be earned. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
BCIS 338	Business Information Systems I	3
BCIS 350	Information Systems Analysis and Design	3
BCIS 475	Database Management Systems	3
Select 9 credits from the following:		9
BCIS 321	Introduction to Software Development and Programming	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
BCIS 480	E-Commerce Security	
BCIS 482	Management of Information Security	
BCIS 485	Enterprise Resource Planning	
BCIS 490	Selected Topics	
Total Credits		18

Business Administration Graduate Program Information

The business and accounting programs at NMSU, including the MBA program, are accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

The Master of Business Administration (MBA) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The MBA program is offered in a traditional classroom with some online delivery and in a cohort-based distance program with a synchronous online component. Details are available at <https://business.nmsu.edu/degree-programs/graduate-programs/masters-programs/mba1/index.html> (<https://business.nmsu.edu/degree-programs/graduate-programs/masters-programs/mba1/>).

The Ph.D. program in Business Administration offers the opportunity to specialize in either Marketing or Management.

Degrees for the Department

Master's Degree(s)

- Business Administration (Agribusiness) - Master of Business Administration (p. 108)
- Business Administration (Finance) - Master of Business Administration (p. 110)
- Business Administration (Health Services Management) - Master of Business Administration (p. 111)
- Business Administration (Health Services Management) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-health-services-mgt-mba-online/>)
- Business Administration (Information Systems) - Master of Business Administration (p. 113)
- Business Administration (Information Systems) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-information-systems-mba-online/>)
- Business Administration (Public Utility Regulations) - Master of Business Administration (p. 114)
- Business Administration (Public Utility Regulations) - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-public-utility-regulations-mba-online/>)
- Business Administration - Master of Business Administration (p. 106)
- Business Administration - Master of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/business-administration-mba-online/>)

F. Arslan, Ph.D. (Texas - El Paso) – information systems; R. Adkisson, Ph.D. (Emeritus); P. G. Benson, Ph.D. (Emeritus); M. J. Billiot, D.B.A. (Mississippi State, C.P.A.) – managerial accounting; J. W. Bishop, Ph.D. (Virginia Tech) – human resource management and organizational behavior; L. Blank, Ph.D. (Tennessee) – micro economics, economics of regulated utilities; D. M. Boje, Ph.D. (Emeritus); R. Clemons, Ph.D. (Texas A&M) – C.P.A., taxation; N. H. Compton, J.D. (Emeritus); B.F. Daily, Ph.D. (Emeritus); D. L. Daniel, Ph.D. (Southern Methodist) – non parametrics; M.E. de Boyrie, Ph.D. (Florida International) – international finance and trade issues; P. W. Dorfman, Ph.D. (Emeritus); C. E. Enomoto, Ph.D. (Emeritus); C. A. Erickson, Ph.D. (Arizona State) – monetary theory, macroeconomics; C. Flinchbaugh, Ph.D. (Kansas) – Organizational behavior, human resources; C. Gard, Ph.D. (University of Washington) – biostatistics; D. A. Gegax, Ph.D. (Emeritus); M. Hyman, Ph.D. (Purdue) – marketing theory and research; D. James, J.D. (Utah) – business law; I.M. Jasso, Ph.D. (Houston) – advertising, strategy; M. Jun, Ph.D. (Georgia State) – production and operations management; J. Kreie, Ph.D. (Emeritus); D. Kealy, M.A. (Yale), J.D. (Concord Law School) – business law; L. LaPlue, Ph.D. (Tennessee) – international and environmental economics.; Y. F. Lee, Ph.D. (Southern Illinois-Carbondale) – international finance, international trade, international monetary system, economic development; J. Loveland, Ph.D. (Emeritus); K. J. Martin, Ph.D. (Purdue) – financial management, corporate control; R. McFerrin, Ph.D. (Texas A&M) – microeconomics, macroeconomics, economic history; J. T. McGuckin, Ph.D. (Emeritus); K. D. Melendrez, Ph.D. (Arizona) – financial accounting; S. K. Mills, Ph.D. (Emeritus); C. Mora-Monge, Ph.D. (Toledo) – supply chain management, information systems; J. A. Nelson, Ph.D. (Emeritus); M. Niculescu, Ph.D. (Cincinnati) – modeling consumer behavior; R. Oliver, Ph.D. (Emeritus); N. A. Oretskin, J.D. (Emeritus); J. T. Peach, Ph.D. (Emeritus); R. T. Peterson (Emeritus); J. Tim Query, Ph.D. (Georgia) – insurance, finance, risk management; S. Rahman, Ph.D.

(Texas-El Paso) - personal financial planning, financial analysis and markets; G. A. Rosile, Ph.D. (Emeritus); H. Sankaran, Ph.D. (Houston) – corporate finance, investments; E. T. Sautter, Ph.D. (Emeritus); E. A. Scribner, Ph.D. (Emeritus); C. Sroka, Ph.D. (Ohio State) – count data models; R. L. Steiner, Ph.D. (Oklahoma State) – likelihood methods, discrete distributions; J. E. Teich, Ph.D. (Emeritus); D. M. VanLeeuwen, Ph.D. (Oregon State) – statistics; B. Widner, Ph.D. (Colorado State) – urban/regional, public finance, development; C. Yildirim, Ph.D. (Texas Tech) – retirement planning investment choices, behavioral finance; Y. You, Ph.D. (Wisconsin) – linguistic framing, anthropomorphism; Y. Zhang, Ph.D. (Texas Tech) – financial accounting; J. Zhu (Iowa) – marketing analytics, machine learning.

Business Administration Courses

B A 105. Special Topics

1-3 Credits

Current topics in business and economics.

B A 291. Business Administration and Economics Internship and Cooperative Education I

1-3 Credits

Introduction and applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience, and not by the work experience.

B A 305. Leadership Training for COB Ambassadors

1 Credit (1)

Leadership development for volunteers serving as COB student ambassadors, focusing on COB undergraduate business degree programs, NMSU student services, public speaking and public relations.

B A 391. Business Administration and Economics Internship and Cooperative Education II

1-3 Credits

Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.

B A 490. Selected Topics

3 Credits (3)

Prerequisites vary according to the seminar being offered.

B A 498. Independent Study

1-3 Credits

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisite: junior or above standing and consent of instructor.

B A 500. Macroeconomic Essentials

1 Credit (1)

Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems. Restricted to: MBA Major majors majors.

B A 501. Quantitative Tools for the MBA

1 Credit (1)

An overview of critical topics in math and statistics that will provide a quantitative foundation for students entering the Master of Business Administration program. Admission to the MBA program.

B A 545. Business Ethics**3 Credits (3)**

Understanding of business ethics, social responsibilities of business organizations, and personal codes of conduct. Complexities of moral reasoning and principles of ethical behavior.

B A 550. Special Topics**3 Credits (3)**

Interdisciplinary seminar in selected current business topics.

Prerequisite(s): Prerequisites vary according to the seminar being offered.

B A 590. Professional Paper/Presentation**3 Credits (3)**

Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Restricted to: MBA majors.

Prerequisite(s): Minimum of 3.0 average in: ACCT 503, BLAW 502, BFIN 503, and MKTG 503 or AEEC 551.

B A 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 3 credits may be earned.

Prerequisite: consent of instructor.

B A 599. Master's Thesis**15 Credits**

Thesis.

Name: College of Business MBA Program

Office Location: Business Complex 131

Phone: (575) 646-8003

Website: <https://business.nmsu.edu/degree-programs/graduate-programs/masters-programs/mba1/index.html> (<https://business.nmsu.edu/degree-programs/graduate-programs/masters-programs/mba1/>)

Economics, Applied Statistics, and International Business

Undergraduate Program Information

The Department of Economics, Applied Statistics, and International Business (EASIB) offers undergraduate degrees in two majors in the bachelor of business administration – one in economics and one in international business. The Department also offers a bachelor of arts in economics. Economics majors work in business, government, and the non-profit sector. The economics major is also a good choice for students who plan to attend graduate school in economics, law, business, and other areas. International business is a good major for those interested in working in the international operations of a business or interested in working outside the United States. International Business graduates often obtain jobs in areas such as management or marketing then work in areas related to international aspects of the business.

Graduate Program Information

Graduate Study in Economics

EASIB cooperates with the Department of Agricultural Economics and Agricultural Business (AEAB) in offering graduate programs in economics, agricultural economics and economic development. The programs are jointly administered by faculty from the two departments. The objective of the master's program is to prepare students for professional positions in business, government, or research institutions. Our master's degrees also are good preparation for those considering applying to a Ph.D. program. EASIB offers a Master of Arts in economics. There are three concentrations: regulatory economics, policy analysis, and econometrics. For more information on the Master of Science degree in agricultural economics, refer to the Agricultural Economics (p. 289) section in this catalog. The Doctor of Economic Development, also jointly administered by the EASIB and AEAB, is a unique program that provides advanced training in applied economic development. Graduates find jobs in industry and government.

Graduate Study in Applied Statistics

A graduate degree administered directly by EASIB is the Master of Applied Statistics. This degree is designed to produce graduates proficient in current practices in statistics and able to enter directly into positions in industry, government or private business. After completing this degree, a person will have the skills needed to execute data analyses, design experiments, and design and analyze surveys.

Graduate Study in Business Administration

The Department of Economics, Applied Statistics, and International Business cooperates with other departments of the College of Business to offer a Master of Business Administration and a Ph.D. in Business Administration. Within the Ph.D. program, the department offers a minor area of study and provides statistics courses to support the doctoral program. More information about these programs is available in this catalog under the College of Business (<https://catalogs.nmsu.edu/nmsu/business/#text>).

Degrees for the Department

Bachelor Degree(s)

- Economics (Energy Economics) - Bachelor of Business Administration (p. 871)
- Economics (Energy Economics) - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-energy-economics-bba-online/>)
- Economics - Bachelor of Arts in Economics (p. 867)
- Economics - Bachelor of Business Administration (p. 869)
- International Business - Bachelor of Business Administration (p. 873)

Master Degree(s)

- Applied Statistics - Master of Science (p. 99)
- Economics (Econometrics) - Master of Arts (p. 128)
- Economics (Econometrics) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-econometrics-ma-online/>)
- Economics (Public Policy) - Master of Arts (p. 128)
- Economics (Public Policy) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-public-policy-ma-online/>)

- Economics (Public Utility Policy and Regulation) - Master of Arts (p. 129)
- Economics (Public Utility Policy and Regulation) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-public-utility-policy-regulation-ma-online/>)
- Economics - Master of Arts (p. 127)
- Economics - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/economics-ma-online/>)

Doctoral Degree(s)

- Applied Statistics - Doctor of Philosophy (p. 174)
- Economic Development - Doctor of Economic Development (p. 183)

Minors for the Department

- Applied Statistics - Graduate Minor (p. 212)
- Economics - Graduate Minor (p. 213)
- Economics - Undergraduate Minor (p. 876)
- International Business - Undergraduate Minor (p. 876)

Graduate Certificates

- Public Utility Regulation and Economics - Graduate Certificate (p. 209)
- Public Utility Regulation and Economics - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-utility-regulation-economics-gr-certificate-online/>)

Christopher A. Erickson, Interim Department Head

Department of Economics, Applied Statistics and International Business:

Professors L. Blank, Ph.D. (Tennessee, Knoxville)-microeconomic theory, managerial economics, regulatory economics; D. L. Daniel, Ph.D. (Southern Methodist)-nonparametrics; C. Enomoto, Ph.D. (Texas A&M)-econometrics, economic theory; C. A. Erickson, Ph.D. (Arizona State)-economic development, monetary theory, macroeconomics; D. A. Gegax, Ph.D. (Wyoming)-public utility economics, industrial organization; Y. F. Lee, Ph.D. (Southern Illinois-Carbondale)-international finance, international trade, international system, economic development; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions; D. M. VanLeeuwen, Ph.D. (Oregon State)-statistics; B. Widner, Ph.D. (Colorado State)-urban/regional, public finance, development **Associate Professors** C. Gard, Ph.D. (Washington)-biostatistics; R. McFerrin, Ph.D. (Texas A & M)-micro theory, American economic history; **Assistant Professors** B. Bai, MS (New Mexico State)-applied statistics; J. Bucheli, Ph.D. (New Mexico)-migration, economic development; L. LaPlue (Tennessee)-international and environmental economics; M. Li, Ph.D. (Pennsylvania State); J. Mamkhezri, Ph.D. (New Mexico)-energy, natural resources, environmental; C. Sroka (Ohio State)-count data models **Emeritus Faculty** R. V. Adkisson, Ph.D. (Nebraska)-international, public finance, economic development; K. Brook, Ph.D. (Texas-Austin)-macroeconomic theory, monetary policy; D.L. Clason, Ph.D. (Kansas State); W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation; M. Ellis, Ph.D. (California-Riverside); B. N. Matta, Ph.D. (Texas-Austin); J. T. McGuckin, Ph.D. (Wisconsin-Madison); J. T. Peach, Ph.D. (Texas-Austin)-quantitative economics, border studies, economic development; A.V. Popp, Ph.D., (Northern Illinois); D.B. Smith, Ph.D., E. S. Willman, Ph.D. (Indiana)

Applied Statistics Courses

A ST 311. Statistical Applications

3 Credits (3)

Techniques for describing and analyzing economic and biological data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. May be repeated up to 3 credits.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Describe a data set with graphical tools and computed measures.
2. Explain the relationship between two numerical variables using correlation and regression.
3. Understand how probability and sampling methods are used to make statistical inferences.
4. Draw inference from a sample to a population using confidence intervals and hypothesis tests.
5. Understand the relationship between population parameters and sample statistics.
6. Understand the basic procedure of data production with sampling and experimental design.

A ST 450. Special Topics

1-4 Credits

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

A ST 465. Statistical Analysis I

3 Credits (3)

An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x², F), estimation, testing, and simulation. Crosslisted with: A ST 565.

Prerequisite(s): MATH 2530G or consent of instructor.

A ST 466. Statistical Analysis II

3 Credits (2+2P)

Continuation of A ST 465. An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x², F), estimation, testing, and simulation. Crosslisted with: A ST 566.

Prerequisite(s): A ST 465 or consent of instructor.

A ST 498. Independent Study

1-3 Credits

Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.

A ST 503. SAS Basics

3 Credits (2+2P)

An introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily PC/SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures.

Corequisite(s): A ST 505.

A ST 504. Statistical Software Applications

1 Credit (1)

Optional Computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506.

Prerequisite(s): A ST 503.

Corequisite(s): A ST 506.

A ST 505. Statistical Inference I**4 Credits (3+2P)**

A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, and testing. One-way analysis of variance. Simple linear regression.

Prerequisite: consent of the instructor.

A ST 506. Statistical Inference II**3 Credits (2+2P)**

Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots. May be repeated up to 3 credits.

Prerequisite: A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.

Learning Outcomes

1. Formulate models, construct ANOVA tables for balanced designs, and conduct complete analyses accounting for factorial treatment structures, and standard experimental design structures, including the completely randomized design, the randomized complete block design, completely randomized design with subsampling, the completely randomized design with a covariate, and the split-plot design.
2. Assess model adequacy including assessing constancy of variance and normality assumptions.
3. Choose an appropriate multiple comparisons procedure to control the experiment wise or family wise Type I error rate.
4. Use contrasts to conduct pre-planned comparisons.
5. Identify the experimental unit(s) in an experiment; formulate a model and conduct an analysis appropriately accounting for the experimental unit(s).
6. Conduct a complete analysis of data from a designed experiment and interpret findings.

A ST 507. Advanced Regression**3 Credits (3)**

Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models. May be repeated up to 3 credits.

Prerequisite: A ST 503 and A ST 505 or consent of instructor.

Learning Outcomes

1. Understand the fundamental philosophy behind regression.
2. Conduct a proper regression analysis, including making inferences and predictions.
3. Address common pitfalls in regression, including model assumption and collinearity issues.
4. Use the R language to perform regression analysis.

A ST 509. Statistical Models for Complex Data Structures**3 Credits (3)**

Statistical models for data that are not normally distributed or data with correlated observations. Covers generalized linear models for discrete and mixed models for correlated data structures. Analysis of data with unbalanced and missing cells.

Prerequisite: A ST 506 with a grade of B or higher, or A ST 507 with a grade of B or higher.

Learning Outcomes

1. Analyze data using classical regression and generalized linear models.
2. Derive quantities of interest from fitted models.
3. Formulate the appropriate hierarchical model for different analytical goals and data structures.
4. Use statistical software to fit hierarchical models and assess the adequacy of the model.
5. Interpret summaries of fitted hierarchical models.

A ST 511. Statistical Methods for Data Analytics**3 Credits (3)**

Statistics fundamentals, with an emphasis on inferential methods, linear regression, and practical applications to data analytics. A ST majors should not take this course if they have already completed A ST 505.

Learning Outcomes

1. Understand descriptive and inferential methods commonly used in data analytics
2. Formulate linear regression models and fit models using statistical software
3. Properly interpret the results of statistical analyses
4. Effectively communicate statistical methods and results orally and in writing

A ST 512. Quantitative Analysis for Business Decisions**3 Credits (3)**

Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making. Crosslisted with: MGMT 512.

Learning Outcomes

1. Understand statistical methods commonly used in business.
2. Identify statistical considerations in the design of studies.
3. Properly interpret the results of statistical analyses and use results to make decisions regarding business problems.
4. Effectively communicate business decisions orally and in writing, using statistics to defend decisions, as appropriate.

A ST 515. Statistical Analysis with R**3 Credits (3)**

Introduction to R data types, basic calculations and programming, data input and manipulation, one and two sample tests, ANOVA, regression, diagnostics, graphics, probability distributions, and basic simulations in the R software environment.

Prerequisite(s): A ST 505 or equivalent with consent of instructor.

A ST 540. Predictive Analytics**3 Credits (3)**

This course covers data analytic techniques that can be used to predict and classify observations outside of the original data. Material includes linear and nonlinear regression models, linear and nonlinear classification models, and classification and regression trees. Students will gain hands-on experience using modern software packages to build predictive models and quantify the accuracy of these models.

Prerequisite(s): A ST 507 or consent of instructor.

A ST 550. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

A ST 551. Introduction to Statistical Consulting**1 Credit (1)**

Consideration of published material in the consulting process. Restricted to majors. Graded S/U.

Prerequisite: consent of instructor.

A ST 552. Advanced Statistical Consulting**1 Credit (1)**

Continuation of A ST 551 with emphasis on dealing with clients in order to identify statistically relevant features of a research study. Restricted to majors. Graded S/U.

Prerequisite: A ST 551.

A ST 553. Practicum in Statistical Consulting**1 Credit (1)**

Supervised experience under the guidance of senior faculty. May be repeated for a maximum of 2 credits. Restricted to majors. Graded S/U.

Prerequisite: A ST 552.

A ST 554. Practicum in Statistics**3 Credits (3)**

Practical experience in data analysis and the reporting of results; selecting and using statistical methods to analyze and interpret real-world problems; written and oral communication of findings

Prerequisite: A ST 503, A ST 506, A ST 507, and A ST 566.

Learning Outcomes

1. Work with real data to gain substantial experience in data analysis, writing, and presentation.
2. Research and apply a variety of statistical methods, some of which students may not have encountered in prior coursework.
3. Apply knowledge and skills gained throughout the program of study, integrating content from across the MS in A ST curriculum.

A ST 555. Applied Multivariate Analysis**3 Credits (3)**

Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques. May be repeated up to 3 credits.

Prerequisite: A ST 506 and A ST 504.

Learning Outcomes

1. Understand the details of various multivariate techniques, emphasizing connections to univariate techniques where applicable.
2. Select appropriate multivariate techniques for a given data set and problem.
3. Use statistical software to perform multivariate analyses.
4. Correctly interpret, write about, and present the results of multivariate analyses.

A ST 565. Statistical Analysis I**3 Credits (3)**

An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, testing, and simulation. Crosslisted with: A ST 465.

Prerequisite(s): MATH 2530G or consent of instructor.

A ST 566. Statistical Analysis II**3 Credits (2+2P)**

Continuation of A ST 565. Crosslisted with: A ST 466.

Prerequisite(s): A ST 565 or consent of instructor.

A ST 567. Applied Linear Models I**3 Credits (3)**

The mean model, including constraints, approach to linear models; nonidentity variance-covariance matrices. Some emphasis on computational aspects and relation to statistical packages.

Prerequisite: A ST 566 or consent of instructor.

A ST 568. Applied Linear Models II**3 Credits (3)**

The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects.

Prerequisite: A ST 567.

A ST 596. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval by department head. May be repeated for a maximum of 3 credits.

Prerequisite: consent of instructor.

A ST 598. Special Research Problems**1-6 Credits**

Individual analytical or experimental projects. Restricted to majors. Graded S/U.

A ST 599. Master's Thesis**1-6 Credits**

Thesis.

A ST 609. Linear Model Theory**3 Credits (3)**

Theoretical treatment of linear models. Covers fixed effects and mixed effects models; models that are full rank, less than full rank, and over-parametrized. Some computational aspects are discussed in relation to statistical packages. Prior to enrollment students should have a basic understanding of undergraduate-level matrix algebra.

Prerequisite: A ST 565, A ST 566, and A ST 509.

Learning Outcomes

1. Derive estimators of model parameters using design matrices, including models that are full rank, less than full rank, and over-parameterized
2. Derive the expectation vector and variance matrix of a linear transformation of a random data vector
3. Derive common test statistics and their distributions for fixed effects and mixed effects models with a balanced design
4. Understand the mathematical properties of variance-covariance matrices and their implications for model estimation and inference
5. Derive and interpret diagnostics for linear models

A ST 616. Computational Statistics**3 Credits (3)**

An introduction to topics in computational statistics including: methods for generating random variables, large scale hypothesis testing, resampling, bootstrapping, permutation tests, the Expectation-Maximization algorithm, Markov chain Monte Carlo methods, and computational approaches in Bayesian inference. Includes some applications of computational statistics in the sciences. Previous experience with programming, while helpful, is not required.

Prerequisite: A ST 505 and A ST 566.

Learning Outcomes

1. Conduct large-scale hypothesis testing
2. Generate random numbers and random variables
3. Implement Markov chain Monte Carlo methods for conducting Bayesian inference
4. Import and manipulate data using R
5. Employ bootstrapping methods for making inferences and conduct statistical hypothesis testing using permutation tests

A ST 645. Time Series Methods**3 Credits (3)**

Theory and methods for analyzing, modeling, and forecasting time series. Covers ARIMA models, spectral analysis, filtering, and state-space models. Previous experience using the R programming language is helpful but not required. Students should have a basic understanding of undergraduate-level matrix algebra and trigonometry.

Prerequisite: A ST 565 and A ST 507.

Learning Outcomes

1. Explore time series datasets for autocorrelation, cross-correlation, and stationarity
2. Select appropriate models for analyzing and forecasting time series data
3. Identify regular patterns and frequencies in time series data
4. Fit time series models using statistical software
5. Understand mathematical theory underlying time series models

A ST 665. Bayesian Theory**3 Credits (3)**

Provides an overview of theory underlying Bayesian inference. Topics include Likelihood and Sufficiency Principles, concepts from decision theory, construction of prior distributions, Bayesian point estimation, tests and confidence regions.

Prerequisite: A ST 565 and A ST 566.

Learning Outcomes

1. Understand the theoretical justification for using Bayesian methods as a means of statistical inference
2. Apply decision-theoretic principles to evaluate estimators under different loss functions
3. Develop prior distributions using the concepts of entropy, conjugacy, and non-informativeness
4. Derive basic point estimators using Bayesian principles
5. Understand testing and confidence region methods used for Bayesian inference

A ST 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation for the Applied Statistics doctoral program. Students must have advancement to candidacy in order to enroll in this course. May be repeated up to 36 credits.

Learning Outcomes

1. Make substantive progress towards completing a dissertation that fulfills the requirements for the Applied Statistics doctoral degree.

Economics Courses

ECON 1110G. Survey of Economics**3 Credits (3)**

This course will develop students' economics literacy and teaches students how economics relates to the everyday life of individuals, businesses and society in general. The course will also introduce students to the roles different levels of governments play in influencing the economy. At the conclusion of the course, students will be able to identify economic causes for various political and social problems at national and international levels, and have a better understanding of everyday economic issues that are reported in media and public forums.

Learning Outcomes

1. Gain and demonstrate a contextual understanding of economic terms and concepts.
2. Recognize and analyze common economic issues which relate to individual markets and the aggregate economy.
3. Learn basic economic principles that influence global trading and challenges relating to globalization.
4. Outline the implications of various economic policies on individuals and on economies.
5. Demonstrate ability to use diagrams and graphs to explain economic principles, policies and their applications.
6. Appreciate and understand how individual decisions and actions, as a member of society, affect economies locally, nationally and internationally.
7. Explain the roles of governments in influencing buyer and seller behavior in the market and how government failure occurs when intervention fails to improve or actually worsens economic outcomes.
8. Be able to apply course concepts to interpret, evaluate and think critically about economic events and policies, especially as regularly reported in the media and other public forums.

ECON 2110G. Macroeconomic Principles**3 Credits (3)**

Macroeconomics is the study of national and global economies. Topics include output, unemployment and inflation; and how they are affected by financial systems, fiscal and monetary policies.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2110H. Principles of Macroeconomics Honors**3 Credits (3)**

Macroeconomic theory and public policy designed: national income concepts, unemployment, inflation, economic growth and international payment problems. Must be a Crimson Scholar.

Prerequisite(s): MATH 1220G.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2120G. Microeconomics Principles**3 Credits (3)**

This course will provide a broad overview of microeconomics.

Microeconomics is the study of issues specific to households, firms, or industries with an emphasis on the role of markets. Topics discussed will include household and firm behavior, demand and supply, government intervention, market structures, and the efficient allocation of resources.

Learning Outcomes

1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 2120H. Principles of Microeconomics Honors**3 Credits (3)**

Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions. Must be a Crimson Scholar.

Prerequisite(s): MATH 1220G.

Learning Outcomes

1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 304. Money and Banking**3 Credits (3)**

Income measurement and determination, monetary and fiscal policies.

Prerequisite(s): ECON 2110G or ECON 2110H or equivalent.

ECON 311. Intermediate Macroeconomic Theory**3 Credits (3)**

Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.

Prerequisite: ECON 2110G or ECON 2110H.

Learning Outcomes

1. Learn the uses and abuses of macroeconomic data
2. Learn the role of economic theory in understanding economic issues and forecasting economic behavior
3. Learn the causes and consequences of short-run economic fluctuations and long-run economic growth
4. Learn the role of government in the macroeconomy
5. By the end of the class, you should be able to describe the state of the macroeconomy and analyze the consequences of economic policy actions from several perspectives

ECON 312. Intermediate Microeconomic Theory**3 Credits (3)**

Contemporary economic theory with emphasis upon value and distribution.

Prerequisite: ECON 2120G or ECON 2120H or equivalent.

Learning Outcomes

1. Gain an understanding of the language of Intermediate Microeconomics.
2. Know the underlying structure of economic models such as supply and demand, consumer theory, producer theory and market structure.
3. Understand the assumptions of economic models.
4. Be able to solve a supply and demand model.
5. Demonstrate critical thinking skills by applying economic models to a wide variety of policy questions.

ECON 324V. Developing Nations**3 Credits (3)**

Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

ECON 325V. Economic Development of Latin America**3 Credits (3)**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the essential components for economic growth and development
2. Understand how Latin America fell behind other regions in terms of economic development
3. Compare various policies implemented to support economic development in the region, as well as the successes and failures of these policies
4. Gain a basic understanding of how to conduct independent research

ECON 332. Public Finance**3 Credits (3)**

This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. **Prerequisites:** ECON 2120G or ECON 2120H

ECON 335V. Business and Government**3 Credits (3)**

Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGMT 335G

ECON 337V. Natural Resource Economics**3 Credits (3)**

Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as AECC 337V.

Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

ECON 345. Energy Economics**3 Credits (3)**

Examines the economics of energy production including oil, coal, natural gas, renewables, and conservation as a substitute for energy production. Emphasis is on federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.

Prerequisite(s): (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

ECON 384V. Water Resource Economics**3 Credits (3)**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AECC 384V.

Prerequisite: AECC 1110 or ECON 2120G or ECON 2120H.

ECON 404. Collegiate Advisory Board, Federal Reserve**3 Credits (3)**

Students serve on the Collegiate Advisory Board of the El Paso branch of the Federal Reserve Bank of Dallas. Guest speakers provide an overview of the Federal Reserve System, role of monetary policy, and issues facing specific industries in the local, national, and global economies. Students prepare reports, including a final paper, on an assigned industry in the regional or state economy and the current economic performance of their industry. Students must be of junior rank or higher with a GPA of at least 3.5. Consent of Instructor required.

ECON 405. Introductory Econometrics**3 Credits (3)**

Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.

Prerequisite: MATH 1350G or A ST 311 (or equivalent).

Learning Outcomes

1. Demonstrate knowledge of probability and statistics and basic expected value theory.
2. Define the relationship between population statistics and sample statistics.
3. Explain the method of ordinary least squares.
4. Understand multiple regression, correlation, inference techniques, and significance tests.
5. Interpret basic econometric results.

ECON 432V. Economics of Health Care**3 Credits (3)**

Analysis of the allocation of resources in the field of health and medical care.

ECON 445. Oil and Natural Gas Economics**3 Credits (3)**

Examines the economics of oil and gas production. Topics covered include transportation, refining, federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.

Prerequisite: (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

Learning Outcomes

1. Oil and Natural Gas Production
2. Oil and Natural Gas Transportation and Storage
3. Advanced oil and gas market analysis
4. Economic analysis of government energy policy and regulation

ECON 449. Open Economy Macroeconomics**3 Credits (3)**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.

Prerequisite(s): BFIN 341 OR ECON 311.

ECON 450. International Economics**3 Credits (3)**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450

Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

ECON 457. Mathematical Economics**3 Credits (3)**

Application of mathematical tools, especially the calculus, to economic theory.

Prerequisite(s): MATH 1430G or equivalent.

ECON 471. Electricity Economics**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric Industry.

Topics include characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

Crosslisted with: ECON 571.

Prerequisite(s): ECON 345.

ECON 489. Senior Economics Seminar**3 Credits (3)**

Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics.

Prerequisite(s): ECON 311 or ECON 312.

ECON 490. Selected Topics**1-3 Credits**

Current topics in economics. Subject matter to be designated for each semester.

ECON 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.

Prerequisite: junior or above standing and consent of instructor.

ECON 503. Managerial Economics**3 Credits (3)**

Theory and application of microeconomics to the management of organizations.

Prerequisite(s): MATH 1350G or A ST 311 or equivalent with B or better.

ECON 545. Econometrics II**3 Credits (3)**

Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

Prerequisite(s): ECON 457 and AEEC 540.

ECON 550. Special Topics**1-3 Credits**

Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

ECON 571. Regulatory Policy and Industry Analysis: Electricity I**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas**3 Credits (3)**

Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

ECON 573. Regulatory Policy and Industry Analysis: Electricity II
3 Credits (3)

Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.

Prerequisite(s): ECON 571 or consent of instructor.

ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis
3 Credits (3)

Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.

Prerequisite(s): ECON 571 or consent of instructor.

ECON 582. Economics of Health Care
3 Credits (3)

Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.

ECON 596. Independent Study
3 Credits (3)

Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

Economic Development Courses

ECDV 550. Introduction to Local and Regional Development
3 Credits (3)

Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.

ECDV 590. Special Topics
1-3 Credits (1-3)

Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.

ECDV 596. Individual Study
1-3 Credits (1-3)

Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.

ECDV 651. Economic Development Theory
3 Credits (3)

Builds upon a general understanding of microeconomic and macroeconomic theory to focus specifically on theories of economic development at all levels. **Prerequisites:** AEEC 501 and 502

ECDV 661. Regional Economic Modeling
3 Credits (3)

Introduction to the tools and methods of regional economic development analysis. May be repeated up to 3 credits. Restricted to: ECDV majors.

Prerequisite(s): AEEC 501, AEEC 502, and AEEC 540.

ECDV 664. Population Economics
3 Credits (3)

Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.

ECDV 668. Economic Development Finance
3 Credits (3)

Focuses on the tools and methods of economic development finance.

ECDV 670. Research in Economic Development
3 Credits (3)

Intense examination of the academic literature on economic development at all levels.

Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 671. Sustainable Economic Development
3 Credits (3)

Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment.

Prerequisites: AEEC 501, AEEC 502 and AEEC 540.

ECDV 673. Research Methods
3 Credits (3)

An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized.

Prerequisites: AEEC 501, AEEC 502 and AEEC 540.

ECDV 681. Urban Economic Development
3 Credits (3)

Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis.

Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 682. Rural Development
3 Credits (3)

Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis.

Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 683. Seminar in National Economic Development
3 Credits (3)

Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects.

Prerequisites: ECDV 681 and ECDV 682.

ECDV 692. Seminar in Economic Development
3 Credits (3)

Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits.

Prerequisite: Completion of at least nine semester hours of ECDV courses.

ECDV 694. Internship
1-9 Credits (1-9)

Internship in Economic Development. May be repeated up to 9 credits.

Restricted to: ECDV majors. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): Completion of core requirements of Doctor of Economic Development.

ECDV 699. Doctoral Project**1-9 Credits (1-9)**

Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

International Business Courses

I B 317. International Marketing**3 Credits (3)**

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as MKTG 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues.
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

I B 351. International Business**3 Credits (3)**

The various aspects of international business, and identification and analysis of problems encountered by multinational companies.

Prerequisite: junior standing or consent of instructor.

I B 398. International Business and Economic Environments**3 Credits (3)**

Description and analysis of various world regions, e.g., Pacific Rim, Eastern Europe, South Asia. Region will vary from semester to semester.

I B 449. Open Economy Macroeconomics**3 Credits (3)**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: ECON 449.

Prerequisite(s): BFIN 341 OR ECON 311.

I B 450. International Economics**3 Credits (3)**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: ECON 450G

Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

I B 475. International Finance**3 Credits (3)**

International aspects of financial transactions, decision-making, banking and financial markets. Crosslisted with: BFIN 475 and BFIN 575.

Prerequisite(s): BFIN 341.

I B 489. Senior Seminar in International Business**3 Credits (3)**

Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project.

Prerequisite: I B core.

Office Location: Business Complex Room 234

Phone: (575) 646-7211

Website: <https://business.nmsu.edu/departments/economics.html>

Economics - Bachelor of Arts in Economics

The Bachelor of Arts major in Economics is the only bachelor of arts degree offered through the College of Business. It has the advantage of including a large number of general electives. This feature provides great flexibility to the student who, in addition to completing the courses for a major in economics, may wish to take a double major or take courses from a wide variety of other subjects of his or her own choosing.

This program is suitable for, among others, students who plan to go to graduate school in economics, law, business, the social sciences or other areas.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		

Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)	
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area V: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C-) ¹	3
Viewing A Wider World Courses ³		6
Departmental/College Requirements		
<i>Foundation Requirements ⁴</i>		
Choose one from the following:		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
ACCT 2110	Principles of Accounting I	3
<i>Major Courses ⁵</i>		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON 457	Mathematical Economics	3
<i>At least two electives must be from the following:</i>		6
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON 450	International Economics	
<i>Additional ECON Upper Division Electives</i>		6
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁶		49
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities Course ²		3
Elective course ³		3
Elective Course ³		3
Credits		16

Spring

MATH 1430G	Applications of Calculus I (C- or better) ¹	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative Fine Arts Course ²		3
Elective Course ³		3
Credits		16

Second Year

Fall		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better)	
ECON 2110G	Macroeconomic Principles ((C- or better, counts towards Area IV Gen.Ed))	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication (C- or better)	
ENGL 2221G	Writing in the Humanities and Social Science (C- or better)	
Elective Course ³		3
Credits		15

Spring

ECON 2120G	Principles of Microeconomics ((C- or better, counts towards Area IV Gen.Ed)) ¹	3
Viewing a Wider World Course ⁴		3
Elective Course ³		4
Elective Course ³		3
Elective Course ³		3

Credits 16

Third Year**Fall**

ECON 304	Money and Banking ¹	3
ECON 311	Intermediate Macroeconomic Theory ¹	3
Elective Course ³		3
Elective Course ³		3
Elective Course ³		3

Credits 15

Spring

ECON 312	Intermediate Microeconomic Theory ¹	3
ECON 405	Introductory Econometrics ¹	3
Viewing a Wider World Course ⁴		3
Elective Course ³		3
Elective Course ³		3

Credits 15

Fourth Year**Fall**

ECON 457	Mathematical Economics	3
Choose one Upper-Division Elective in ECON from the following: ⁵		3
ECON 332	Public Finance ¹	
ECON 449	Open Economy Macroeconomics ¹	
ECON 450	International Economics	
Elective Course ³		3
Elective Course ³		3
Elective Course ³		3

Credits 15

Spring

Choose one Upper-Division Elective in ECON from the following (it must differ from the Fall semester):⁵

ECON 332	Public Finance ¹	
ECON 449	Open Economy Macroeconomics ¹	
ECON 450	International Economics	
ECON Upper-Division Elective Course ⁵		3
ECON Upper-Division Elective Course ⁵		3
Elective Course ³		3

Credits 12

Total Credits 120

¹ Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.

Fall: ECON 337V Natural Resource Economics, ECON 432V Economics of Health Care, ECON 449 Open Economy Macroeconomics

Fall/Summer: ECON 457 Mathematical Economics

Spring: ECON 384V Water Resource Economics

⁶ **International Business Double Majors:** Students may not receive credit for both ECON 489 Senior Economics Seminar and I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Economics - Bachelor of Business Administration

This program is especially suitable for students who find economics interesting and who intend, perhaps without additional formal education beyond the Bachelor degree, to take jobs in business or government. This degree prepares you for a wide variety of jobs including those leading eventually to positions of executive responsibility. It is also appropriate for those who may choose to seek a Master of Business Administration degree after graduation. It is also a great degree for someone interested in pursuing a career as a lawyer.

In addition to completing general education, (p. 220) College of Business foundation and business core (p. 842), Viewing a Wider World (p. 224) requirements, and general electives (see above), every candidate for the bachelor of business administration in economics must complete each of these courses with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		

MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)	
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C- (foundation requirement)) ¹	3
Viewing A Wider World Courses ³		6
Departmental/College Requirements		
<i>Foundation Requirements ⁴</i>		
Choose one from the following:		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one from the following:		3
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses ⁵</i>		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
<i>ECON Upper Division Electives</i>		12
At least two electives must be from the following:		
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON/I B 450	International Economics	
ECON 457	Mathematical Economics	
Second Language: (not required)		

Electives, to bring the total credits to 120 ⁶	16
Total Credits	120

- ¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
- ² See the General Education (p. 220) section of the catalog for a full list of courses.
- ³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.
- ⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.
- ⁵ Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.
- ⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities ²		3
Elective Course ³		3

Credits 16

Spring

MATH 1430G	Applications of Calculus I (C- or better) ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	

Area III: Laboratory Science Course ² 4

Area VI: Creative and Fine Arts Course ² 3

Credits 16

Second Year**Fall**

Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better)	
ECON 2110G	Macroeconomic Principles (C- or better, counts towards Area IV Gen.Ed)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication (C- or better, counts towards Area I Gen.Ed) ¹	3
Elective Course ³		3
Credits		15

Spring

ECON 2120G	Principles of Microeconomics (C- or better, counts towards Area IV Gen.Ed) ¹	3
ACCT 2120	Principles of Accounting II	3
Elective Course ³		4
Elective Course ³		3
Viewing a Wider World Course ⁴		3
Credits		16

Third Year**Fall**

ECON 304	Money and Banking ¹	3
ECON 311	Intermediate Macroeconomic Theory ¹	3
BCIS 338	Business Information Systems I ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
Credits		15

Spring

ECON 312	Intermediate Microeconomic Theory ¹	3
ECON 405	Introductory Econometrics ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
Viewing a Wider World Course ⁴		3
Credits		15

Fourth Year**Fall**

Choose one Upper-Division Elective in ECON from the following:		3
ECON 332	Public Finance ¹	
ECON 449	Open Economy Macroeconomics ¹	
ECON 450	International Economics	
or I B 450	or International Economics	
ECON 457	Mathematical Economics	
ECON Upper-Division Elective ⁵		3
ECON or A ST Upper-Division Elective Course (excluding A ST 311) ⁵		3
Choose one from the following:		3
BCIS 485	Enterprise Resource Planning ¹	
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations	
Elective Course ³		3
Credits		15

Spring

ECON Upper-Division Elective Course ⁵		3
ECON Upper-Division Elective Course ⁵		3
MGMT 449	Strategic Management ¹	3

Any Business Upper-Division Elective Course (excluding A ST 311)	3
Credits	12
Total Credits	120

¹ Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.

Fall: ECON 337V Natural Resource Economics, ECON 432V Economics of Health Care, ECON 449 Open Economy Macroeconomics

Fall/Summer: ECON 457 Mathematical Economics

Spring: ECON 384V Water Resource Economics

⁶ **International Business Double Majors:** Students may not receive credit for both ECON 489 Senior Economics Seminar and I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Economics (Energy Economics) - Bachelor of Business Administration

This program is especially suitable for students interested in a career in the energy sector. This degree prepares you for jobs in the energy sector, including those in administration, and those leading eventually to positions of executive responsibility.

the concentration in energy economics must complete the following: ECON 345 (<https://catalogs.nmsu.edu/search/?P=ECON%20332>) Energy Economics (3 cr.), ECON 335v (<https://catalogs.nmsu.edu/search/?P=ECON%20336>) Business and Government (3 cr.), ECON 445 (<https://catalogs.nmsu.edu/search/?P=ECON%20401>) Oil and Natural Gas Economics (3 cr.), and ECON 471 (<https://catalogs.nmsu.edu/search/?P=ECON%20450>) Electricity Economics (3 cr.).

In addition to completing general education, (p. 220) College of Business foundation and business core (p. 842), Viewing a Wider World (p. 224) requirements, and general electives (see above), every candidate for the bachelor of business administration in economics must complete each of these courses with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C- (foundation requirement)) ¹	3
Viewing A Wider World Courses ³		6
Departmental/College Requirements		
<i>Foundation Requirements</i> ⁴		
Choose one from the following:		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one from the following:		3
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	

BCIS 485	Enterprise Resource Planning	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i> ⁵		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
<i>ECON Upper Division Electives</i>		12
At least two electives must be from the following:		
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON/I B 450	International Economics	
ECON 457	Mathematical Economics	
<i>Concentration Coursework</i>		
ECON 345	Energy Economics	3
ECON 335V	Business and Government	3
ECON 445	Oil and Natural Gas Economics	3
ECON 471	Electricity Economics	3
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁶		4
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.

⁶ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities ²		3
Elective Course ³		3
Credits		16

Spring

MATH 1430G	Applications of Calculus I (C- or better) ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Fall		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better)	
ECON 2110G	Macroeconomic Principles (C- or better, counts towards Area IV Gen.Ed)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication (C- or better, counts towards Area I Gen.Ed) ¹	3
Elective Course ³		3
Credits		15

Spring

ECON 2120G	Principles of Microeconomics (C- or better, counts towards Area IV Gen.Ed) ¹	3
ACCT 2120	Principles of Accounting II	3
Elective Course ³		4
Elective Course ³		3
Viewing a Wider World Course ⁴		3
Credits		16

Third Year

Fall		
ECON 304	Money and Banking ¹	3
ECON 311	Intermediate Macroeconomic Theory ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
ECON 345	Energy Economics	3
Credits		15

Spring

ECON 312	Intermediate Microeconomic Theory ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3

Viewing a Wider World Course ⁴		3
ECON 335V	Business and Government	3
Credits		15

Fourth Year

Fall		
Choose one Upper-Division Elective in ECON from the following:		3
ECON 332	Public Finance ¹	
ECON 449	Open Economy Macroeconomics ¹	
ECON 450	International Economics	
or I B 450	or International Economics	
ECON 457	Mathematical Economics	
ECON or A ST Upper-Division Elective Course (excluding A ST 311) ⁵		3
Choose one from the following:		3
BCIS 485	Enterprise Resource Planning ¹	
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations	
BCIS 338	Business Information Systems I	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
Credits		15

Spring

ECON 405	Introductory Econometrics	3
ECON 445	Oil and Natural Gas Economics	3
MGMT 449	Strategic Management ¹	3
ECON 471	Electricity Economics	3
Credits		12
Total Credits		120

¹ Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.

Fall: ECON 337V Natural Resource Economics, ECON 432V Economics of Health Care, ECON 449 Open Economy Macroeconomics

Fall/Summer: ECON 457 Mathematical Economics

Spring: ECON 384V Water Resource Economics

⁶ **International Business Double Majors:** Students may not receive credit for both ECON 489 Senior Economics Seminar and I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

International Business - Bachelor of Business Administration

The Bachelor of Business Administration in International Business is intended for those who plan to work for businesses with operations abroad or between the United States and foreign countries. The

program prepares you for positions requiring knowledge of international payments, foreign exchange markets, global marketing, export and import procedures, and international investments.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above.

In addition to the course work indicated below, students must satisfy the following two requirements:

Second language: Students must demonstrate oral and written proficiency at the intermediate mid-level according to ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines.

International experience requirement: Students must engage in an international experience equivalent to a semester abroad in a university where the language of instruction is not English. The department will determine the appropriateness of international experience. Study abroad programs must be pre-approved by IB advisors and the Department Head.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) ¹	3
Viewing a Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements</i> ⁴		
Choose one from the following:		3

If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹

MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one from the following:		3
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i> ⁵		
I B 351	International Business	3
I B/ECON 450	International Economics	3
I B/ECON 449	Open Economy Macroeconomics	3
Choose two from the following:		6
I B 475	International Finance	
or BFIN 475	International Managerial Finance	
ECON 324V	Developing Nations	
I B 398	International Business and Economic Environments	
<i>Upper Division Courses: Functional Business area</i>		15
Courses must be in a single functional business area beyond elsewhere required for the I B major ⁶		
Second Language (See "Second language requirement" description above)		
International Experience (see "International experience requirement" description above)		
Electives, to bring the total credits to 120 ⁷		10
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics

course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Candidates must earn a minimum cumulative GPA of 2.5 in all major course requirements. At least 12 of the 15 credit hours counted toward the international business major courses must be earned at NMSU. No more than 3 of the 15 required major credits may be earned while studying abroad.

⁶ At least 9 of the 15 credit hours counted toward the international business functional area must be earned at NMSU. No more than 6 of the 15 required business functional area credits may be earned while studying abroad.

⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities Course ²		3
Elective Course ³		3
Credits		16

Spring		
MATH 1430G	Applications of Calculus I (C- or better) ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Fine Arts Course ²		3
Credits		16

Second Year

Fall		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better)	

ECON 2110G	Macroeconomic Principles (C- or better, counts towards Area IV Gen.Ed)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication (C- or better, counts towards Area I Gen.Ed) ¹	3
Viewing a Wider World Course ⁴		3

Credits 15

Spring		
ECON 2120G	Principles of Microeconomics (C- or better, counts towards Area IV Gen.Ed) ¹	3
ACCT 2120	Principles of Accounting II	3
Elective Course ²		4
Elective Course ³		3
Viewing a Wider World Course ⁴		3

Credits 16

Third Year

Fall		
I B 351	International Business ¹	3
Upper Division Course- Functional Business Area		3
BCIS 338	Business Information Systems I ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3

Credits 15

Spring		
BFIN 341	Financial Analysis and Markets ¹	3
Upper Division Course: Functional Business area		3
BLAW 316	Legal Environment of Business	3
ECON or A ST Upper- Division Elective (excluding A ST 311) ³		3
I B 475	International Finance	3

Credits 15

Fourth Year

Fall		
Choose one from the following:		3
ECON 324V	Developing Nations	
I B 398	International Business and Economic Environments (spring only)	
BFIN 475 or I B 475	International Managerial Finance (Fall only) or International Finance	
Choose one from the following:		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning ¹	
Upper Division Course: Functional Business area		3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
ECON 450 or I B 450	International Economics or International Economics	3

Credits 15

Spring		
ECON 449 or I B 449	Open Economy Macroeconomics or Open Economy Macroeconomics	3
MGMT 449	Strategic Management ¹	3
Upper-Division Course: Functional Business area		3
Upper-Division Course: Functional Business area		3

Credits 12

Total Credits 120

¹ Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.

- 2
See the General Education (p. 220) section of the catalog for a full list of courses.
- 3
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- 4
See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- 5
Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.
- 6
Students are required to take the following in order to meet the requirements for the degree:
 - I B 450 International Economics or ECON 450 International Economics
- 7
International Business Double Majors: Students may not receive credit for both ECON 489 Senior Economics Seminar and I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Other Requirements for the Major

Foreign language: Students must demonstrate oral and written proficiency at the intermediate mid-level according to ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines. (Process for demonstrating proficiency to be coordinated with the NMSU Department of Languages and Linguistics. Any costs associated with proficiency demonstration will be paid by the student.)

International experience requirement: Students must partake of an international experience equivalent to a semester abroad in a university where the language of instruction is not English. The department will determine appropriateness of international experience. Study abroad programs must be pre-approved by IB advisors and Department Head.

Economics - Undergraduate Minor

The undergraduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro-economic forces influence individuals, business and government decision making. Students thinking of a career in banking and finance, government service, or law will find the minor helpful.

A minor in economics consists of 18 or more credit hours of approved course work in economics (ECON), of which at least 12 are numbered 300 or higher, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ECON 2110G	Macroeconomic Principles ¹	3
ECON 2120G	Principles of Microeconomics ¹	3
ECON 304 or ECON 311	Money and Banking Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3

Upper-division courses (300 or higher) in economics	6
Total Credits	18

¹ ECON 1110G Survey of Economics may be substituted for one of Econ 251G Principals of Macroeconomics or Econ 252G Principals of Microeconomics with the approval of the Head of the Department of Economics, Applied Statistics, and International Business.

International Business - Undergraduate Minor

A minor in international business provides the student with a background in international business that can be useful in many settings given the increasing intensity of globalization. Especially those who wish to find work with large companies with an international presence or for those who may want to own their own business dealing internaionally, the minor in international business can help lay the groundwork for a successful career.

A minor consists of 18 or more credit hours of approved course work in the International Business core, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
I B 351	International Business	3
ECON/I B 450	International Economics	3
BFIN/I B 475 or ECON 449	International Managerial Finance Open Economy Macroeconomics	3
I B 489	Senior Seminar in International Business	3
Select one from the following:		3
ECON 324V	Developing Nations	
I B 398	International Business and Economic Environments	
Upper-division business course		3
Total Credits		18

In addition, I B minors must meet the foreign language proficiency requirement described below.

Students must demonstrate oral and written proficiency in a foreign language at the intermediate mid-level according to the ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines. (Process for demonstrating proficiency to be coordinated with the NMSU Department of Languages and Linguistics. Any costs associated with proficiency demonstration will be paid by the student.)

Finance Undergraduate Program Information

Finance is the management of money and cash flow for business organizations, government and individuals. The study of finance involves examining the theory and techniques of managing money, including analysis and management of risk. Finance students learn to apply tools and concepts from mathematics, statistics, economics and accounting to financial decision-making. With this knowledge, finance graduates are in high demand by employers and command some of the highest salaries for

college graduates. Depending upon their career goals and interests, finance majors may use the electives in the major to focus their program of study on financial management, personal financial planning, investments, banking, entrepreneurial finance, and/or risk management and insurance.

Degrees for the Department

- Finance (Banking and Financial Planning) - Bachelor of Business Administration (p. 882)
- Finance (Entrepreneurial Finance) - Bachelor of Business Administration (p. 883)
- Finance (Financial Analyst) - Bachelor of Business Administration (p. 885)
- Finance (Risk Management and Insurance) - Bachelor of Business Administration (p. 886)
- Finance - Bachelor of Business Administration (p. 881)

Minors

Entrepreneurship and Innovation, Finance, and Risk Management & Insurance minors, can only be earned by non-finance majors. The Business Law minor is open to all majors.

- Business Law - Undergraduate Minor (p. 888)
- Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor (p. 888)
- Finance - Undergraduate Minor (p. 888)
- Risk Management and Insurance - Undergraduate Minor (p. 888)

(Contact the Finance Department Head in BC 221 prior to signing up for Business Law Minor)

- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 125)
- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)
- Finance - Graduate Certificate (p. 207)

Professor Kenneth Martin, Department Head

Professors de Boyrie, Martin, Query, Sankaran; **Associate Professor** Rahman; **Assistant Professor** Yildirim; **College Professors** Pallares, James, Kealy; **College Associate Professor** Fuchs; **College Assistant Professor** Kerr; **Emeritus Professors** Ellis, Oretskin, Fortin

Business Finance Courses

BFIN 2110. Introduction to Finance

3 Credits (3)

Introduces tools and techniques of financial management. Includes time value of money; financial planning, diversification and risk; debt and equity investment decisions; and financial statement analysis.

Prerequisite(s): OATS 106 or higher; OATS 120 or ACCT 2110; ECON 1110G or ECON 2110G.

Learning Outcomes

1. Explain the time value of money and its application in decision-making, including calculating present and future values of single payment and series of payments.
2. Identify the major sources of external long-term financing for corporations.
3. Explain risk-return tradeoff as it relates to diversification.
4. Differentiate the role of finance from other related disciplines such as accounting and economics.
5. Demonstrate knowledge of capital markets and securities (debt and equity).
6. Describe basic types of financial ratios and their uses.
7. Demonstrate the ability to prepare cash flows and make qualitative judgments on the relevance of the changes from one time frame to another.

BFIN 303V. Personal Financial Planning and Investing in a Global Economy

3 Credits (3)

Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.

BFIN 311. Financial Futures Markets

3 Credits (3)

Same as AEEC 311.

BFIN 322. Principles of Insurance

3 Credits (3)

Theory and practice of insurance and its economics and social significance; review of the major lines of insurance including life, health, and property liability insurance.

BFIN 323. Life/Health/Employee Benefits

3 Credits (3)

Approaches to problems of employee security from the perspective of businesses. Topics including pensions, profit-sharing plans, 401(k) plans, group life and health plans, and flexible benefit programs. The course also addresses individual life, health, and annuity contracts within a financial planning context. May be repeated up to 3 credits.

Prerequisite/Corequisite: BFIN 322.

Learning Outcomes

1. Understand the various types of life insurance and annuity contracts and their uses.
2. Know how life and health insurers are regulated.
3. Analyze the insurance marketplace and health care reform.
4. Review contractual provisions of life insurance policies.
5. Understand how human life value is determined.
6. Calculate life contingencies and pricing of life and health insurance.

BFIN 324. Property and Liability Insurance**3 Credits (3)**

Analysis of property and liability insurance with emphasis on handling of commercial exposures. Review of property and liability company operations including rate making and insurance accounting. May be repeated up to 3 credits.

Prerequisite/Corequisite: BFIN 322.

Learning Outcomes

1. Determine if an insurance policy covers an insurance claim.
2. Calculate the amount payable for an insurance claim.
3. Choose the insurance needed for a given situation.
4. Define frequently used insurance terms and acronyms.
5. Explain the responsibility of the various insurance functions.

BFIN 325. Real Estate Principles and Law I**3 Credits (3)**

Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BLAW 325.

BFIN 326. Business Risk Management**3 Credits (3)**

The operational risks faced by firms and the study of various methods of handling these risks, including loss prevention, risk retention, self-insurance, corporate insurance programs, and capital markets. May be repeated up to 3 credits.

Prerequisite/Corequisite: BFIN 322.

Learning Outcomes

1. Develop an understanding of risk management and its basic concepts.
2. Discuss alternative approaches to risk management and develop the knowledge to analyze the features and benefits of enterprise risk management.
3. Gain knowledge regarding risk assessments and the fundamental requirements for a successful risk management program through risk classification and risk analysis tools and techniques.
4. Apply risk control techniques to the identified risks and learn the importance of insurance and risk transfer.
5. Explore the importance of risk management strategy and risk management policy while understanding the techniques to implement a successful risk management program.
6. Develop knowledge about creating a risk-aware culture and understanding an organization's risk appetite.
7. Understand risk governance and how corporate governance requirements impact an organization's risks.
8. Learn risk assurance and risk reporting within an organization to expand their knowledge regarding internal control and corporate social responsibility.

BFIN 341. Financial Analysis and Markets**3 Credits (3)**

Financial analysis for business financing and investing decisions. Prerequisites ACCT 2110, ECON 2110G, ECON 2120G, MATH 1220G, A ST 311 or MATH 1350G.

BFIN 355. Investments**3 Credits (3)**

Analysis of investment risks and rewards and of the problems of portfolio selection and management. Operation of the securities market.

Prerequisite(s): BFIN 341 with a grade of C- or better.

BFIN 360. Financial Information Technology**3 Credits (3)**

Integrated use of electronic financial information resources with spreadsheet and word processing applications in investigating financial issues and solving financial problems.

Prerequisite(s): a grade of C- or better in BFIN 341 or consent of instructor.

BFIN 385. Analysis of Financial Markets and Institutions**3 Credits (3)**

Analysis of the financial system, emphasizing its institutions and instruments.

Prerequisite(s): BFIN 341 with a grade of C- or better.

BFIN 391. Finance Internship and Cooperative Education I**1-3 Credits**

Introduction and application of finance principles in a work environment. Open only to students in the finance major or minor who will be working with an approved employer in a finance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required.

BFIN 392. Insurance Internship and Cooperative Education I**1-3 Credits (1-3)**

Introduction and application of insurance principles in a work environment. Open only to students in the finance major or insurance minor who will be working with an approved employer in an insurance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required. Restricted to Finance majors.

BFIN 393. Banking Internship and Cooperative Education**1-3 Credits (1-3)**

Professional banking experience with opportunities to engage in business analysis and to observe application of business principles in the management of a banking entity or a regulatory agency with banking oversight. Open only to students in the finance major or banking minor who will be working with an approved employer in a banking related position, over a period of 12 weeks or at least 300 work hours. May be repeated up to 3 credits. Consent of Instructor required.

BFIN 406. Theory of Financial Decisions**3 Credits (3)**

Contemporary financial theory. Firm valuation, investments and financing decisions, risk analysis.

Prerequisite(s): BFIN 341 with a grade of C- or better.

BFIN 421. Personal Financial Planning for Professionals**3 Credits (3)**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.

Prerequisite(s): BFIN 341, or consent of Instructor.

BFIN 435. Investment Analysis**3 Credits (3)**

Efficiency of capital markets, modern portfolio management, special topics of current interest to investment analysts.

Prerequisite: BFIN 355.

BFIN 445. Fixed Income Markets, Instruments and Derivatives**3 Credits (3)**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored.

Prerequisite(s): BFIN 341.

BFIN 455. Derivative Markets and Securities**3 Credits (3)**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles.

Prerequisite(s): BFIN 355.

BFIN 470. Real Estate Appraisal**3 Credits (2+2P)**

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to student in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with: AEEC 470.

Prerequisite(s): Junior or above standing.

BFIN 475. International Managerial Finance**3 Credits (3)**

International aspects of financial transactions, decision-making, banking and financial markets. Crosslisted with: I B 475 and BFIN 575.

BFIN 480. Management of Financial Institutions**3 Credits (3)**

Asset and liability management of financial institutions; emphasis on commercial bank management.

Prerequisite: BFIN 385 or consent of instructor.

BFIN 490. Selected Topics**1-3 Credits**

Current topics in finance.

Prerequisites: vary according to the seminar being offered.

BFIN 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

BFIN 500. Concepts in Finance**1 Credit (1)**

An overview of fundamental principles of finance necessary for prospective MBA students who do not have an undergraduate background in finance. Includes: Time value of money concepts and calculations; risk and calculation of return given appropriate risk measures; bond risk characteristics and calculation of the value of a bond; calculation of the value of common stock (determination as to whether a stock is over-valued or under-valued); and calculation of the costs of capital and capital budgeting problems using the cost of capital.

Prerequisite(s): admitted to MBA Program or consent of course department.

BFIN 503. Financial Management**3 Credits (3)**

Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions.

Prerequisite(s): BFIN 341 with a grade of B or better.

BFIN 511. Advanced Derivative Markets**3 Credits (3)**

This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC/BFIN 311 and AEEC/BFIN 311. Crosslisted with: AEEC 511. May be repeated up to 3 credits.

Learning Outcomes

1. Define risk and identify methods of managing risk
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets
3. Identify the role that derivative markets play in reducing risk
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation

BFIN 521. Personal Financial Planning for Professionals**3 Credits (3)**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments. For Graduate students only

Learning Outcomes

1. Describe the financial planning process, assess the external environment, use goals to establish financial direction, and analyze a client's present financial position.
2. Estimate the impacts of income tax planning strategies, apply the basic process for retirement planning, and define the considerations for estate planning.
3. Evaluate the roles of various insurances products in managing risks, and recognize the professional and ethical aspects of financial planning

BFIN 535. Investment Concepts**3 Credits (3)**

Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management. For Graduate students only

Learning Outcomes

1. Model forecasted financial statements using Microsoft Excel.
2. Build financial models in Excel to estimate risk and return for individual stock.
3. Build financial models in Excel to construct an efficiently diversified portfolio.
4. Make decisions regarding investments for the Wetherbe Student-Managed Investment Fund.

BFIN 545. Fixed Income Markets, Instruments and Derivatives**3 Credits (3)**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Assignments and exams will be differentiated from the undergraduate cross-listed course. In addition, graduate students are expected to complete a project. For Graduate students only.

Learning Outcomes

1. Describe basic features of a fixed-income security.
2. Describe mechanisms available for issuing bonds in primary markets.
3. Analyze repurchase agreements (repos) and the risks associated with them.
4. Compute invoice prices, yields, spot rates, and forward rates.
5. Compute PVB, duration and convexity of a bond, duration of a portfolio of bonds.
6. Construct the term-structure of interest rates, Yield curve strategies.
7. Describe the process of calibrating a binomial interest rate tree to match a specific term structure.
8. Explain the principles underlying, and factors that influence, the market's pricing of CDS.
9. Explain and execute interest rate swaps.

BFIN 555. Derivative Markets and Securities**3 Credits (3)**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Same as BFIN 455 with differentiated assignments for graduated students. For Graduate students only.

Learning Outcomes

1. Define forward contracts, futures contracts, options (call and puts), swaps, and credit derivatives and compare their basic characteristics.
2. Determine the value at expiration and profit from a long or a short position in a call or put option, or combinations such as straddles, covered calls, spreads, put-call parity etc.
3. Explain how the concepts of arbitrage, replication, and risk neutrality are used in pricing derivatives.
4. Explain how the value of an option is determined using a multiperiod-period binomial model.
5. Describe how the Black-Scholes-Merton model is used to value European options on equities.
6. Interpret each of the option Greeks.
7. Describe how a delta hedge is executed.
8. Define implied volatility and explain how it is used in options trading.
9. Describe a futures contract: long and short positions, hedging, basis risk, and hedge ratios

BFIN 575. International Managerial Finance**3 Credits (3)**

International aspects of financial transactions, decision-making, banking and financial markets. For Graduate students only.

Learning Outcomes

1. Explain and evaluate how the globalization process moves a business from a purely domestic focus in its financial relationships and composition to one truly global in scope.
2. Describe what three major corporate currency exposure arises from multinational business.
3. Define and explain the terms that are used in reference to exchange rates and currency regimes in addition to analyzing the characteristics of an ideal currency.
4. Explain how nations measure their own level of international economic activity and how that is measured by the balance of payments.
5. Show how interest rates and inflation affect each country and currency.
6. Identify the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions.
7. Distinguish between spot, forward, swaps, and other types of foreign exchange financial instruments as well as foreign currency futures and options contracts.
8. Demonstrate how both the diversifiable and non-diversifiable risks of an investor's portfolio may be reduced through international diversification.
9. Evaluate the various internal and external sources of funds available for the financing of foreign subsidiaries.

BFIN 581. Management of Financial Institutions**3 Credits (3)**

Asset and liability management of financial institutions; emphasis on commercial bank management. For Graduate students only.

Learning Outcomes

1. Describe the Financial System and Competing Financial Service Institutions.
2. Describe the impact of government policy and regulation on the banking industry.
3. Explain the array of organizational structures in Banking: Unit, Branch, Holding. Company and Electronic Services.
4. Analyze the Balance Sheets and Income Statements of Banks.
5. Measure and evaluate the performance of Banks and their principal competitors.
6. Apply different liquidity management strategies.

BFIN 590. Selected Topics**1-3 Credits (1-3)**

Current topics in finance. Taught with BFIN 490 with differentiated assignments for graduate students. Consent of instructor required.

BFIN 598. Special Research Programs**1-3 Credits**

Directed individual reading or research.

Prerequisite: consent of instructor.

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Finance - Bachelor of Business Administration

Finance is the crossroads of economics, strategy and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in a variety of areas including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, risk management and insurance, and entrepreneurial finance.

Courses in the BBA in Finance are organized into four concentrations: Financial Analyst, Banking and Financial Planning, Risk Management and Insurance, and Entrepreneurial Finance. Students may pursue one or more concentrations. If a student chooses not to pursue a concentration, they may select four courses from any concentration or any BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
<i>Area I: Communications</i>		
<i>English Composition Level - 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3

Area III/IV: Laboratory Sciences and Social/Behavioral Sciences

Area III: Laboratory Sciences ² 4

Grades of C- or better are required in ECON 2110G and ECON 2120G.

ECON 2110G Macroeconomic Principles 3

ECON 2120G Principles of Microeconomics 3

Area V: Humanities ² 3

Area VI: Creative and Fine Arts ² 3

General Education Elective ² 3

Viewing A Wider World ³ 6

Departmental/College Requirements

Foundation Requirements

MATH 1430G Applications of Calculus I 3

Choose one from the following (grade of C- or better required):

If MATH 1350G is taken before MATH 1220G then the Statistics course will Satisfy the Area II Requirement for Gen.Ed and MATH 1220G must be taken as a foundation requirement ¹ 3

MATH 1350G Introduction to Statistics

A ST 311 Statistical Applications

Business Core: Lower Division (minimum grades of C- required)

ACCT 2110 Principles of Accounting I 3

ACCT 2120 Principles of Accounting II 3

BCIS 1110 Introduction to Information Systems 3

BUSA 1110 Intro to Business 3

Business Core: Upper Division

BCIS 338 Business Information Systems I 3

BLAW 316 Legal Environment of Business 3

BFIN 341 Financial Analysis and Markets 3

MGMT 309 Human Behavior in Organizations 3

MGMT 449 Strategic Management 3

MKTG 303 Principles of Marketing 3

Choose one of the following: 3

BCIS 485 Enterprise Resource Planning

MGMT 344 Production and Operations Management

MGMT 470 Project Management in Organizations

Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON 3

Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311) 3

Major Courses

BFIN 355 Investments 3

BFIN 360 Financial Information Technology 3

BFIN 385 Analysis of Financial Markets and Institutions 3

BFIN 406 Theory of Financial Decisions 3

Twelve credits from: 12

A declared concentration ⁴

or

Four courses from any BFIN prefix above BFIN 310 or from any concentration below, for students not wishing to declare a concentration

Second Language: (not required)

Electives, to bring the total credits to 120 ⁵ 13

Total Credits 120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

- ² See the General Education (p. 220) section of the catalog for a full list of courses.
- ³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁴ For more information on concentrations see the pages below:
 - Banking and Financial Planning (p. 882)
 - Entrepreneurial Finance (p. 883)
 - Financial Analyst (p. 885)
 - Risk Management and Insurance (p. 886)
- ⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 220), College of Business foundation and business core (p. 842), Viewing a Wider World (p. 220) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any BFIN prefix above BFIN 310.

A Suggested Plan of Study for Students

Junior		
Fall		Credits
BFIN 341	Financial Analysis and Markets	3
BFIN elective		3
Credits		6
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
Credits		9
Senior		
Fall		
BFIN 406	Theory of Financial Decisions	3
BFIN elective		3
Credits		6
Spring		
BFIN elective		3
BFIN elective		3
Credits		6
Total Credits		27

Finance (Banking and Financial Planning) - Bachelor of Business Administration

Finance is the crossroads of economics, strategy and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core

foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in a variety of areas including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, risk management and insurance, and entrepreneurial finance.

Courses in the BBA in Finance are organized into four concentrations: Financial Analyst, Banking and Financial Planning, Risk Management and Insurance, and Entrepreneurial Finance. Students may pursue one or more concentrations. If a student chooses not to pursue a concentration, they may select four courses from any concentration or any BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
Area I: Communications		
English Composition Level - 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional & Technical Communication	3
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra ¹	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences ²		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
Area V: Humanities ²		
Area VI: Creative and Fine Arts ²		
General Education Elective ²		3
Viewing A Wider World ³		6
Departmental/College Requirements		
Foundation Requirements		

MATH 1430G	Applications of Calculus I	3
Choose one from the following (grade of C- or better required):		
If MATH 1350G is taken before MATH 1220G then the Statistics course will Satisfy the Area II Requirement for Gen.Ed and MATH 1220G must be taken as a foundation requirement ¹		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one of the following:		
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
BFIN 406	Theory of Financial Decisions	3
<i>Twelve credits from:</i>		
<i>Banking and Financial Planning Concentration (12 credits from the following)</i>		12
BFIN 480	Management of Financial Institutions	
BFIN 393	Banking Internship and Cooperative Education	
BFIN 421	Personal Financial Planning for Professionals	
BFIN 435	Investment Analysis	
BFIN 445	Fixed Income Markets, Instruments and Derivatives	
BFIN 470	Real Estate Appraisal	
BFIN 498	Independent Study	
or		
Four courses from any BFIN prefix above BFIN 310 or from any concentration below, for students not wishing to declare a concentration		
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		13
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education (p. 220), College of Business foundation and business core (p. 842), Viewing a Wider World (p. 224) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any BFIN prefix above BFIN 310.

A Suggested Plan of Study for Students

Junior		
Fall		Credits
BFIN 341	Financial Analysis and Markets	3
BFIN elective		3
		Credits
		6
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
		Credits
		9
Senior		
Fall		
BFIN 406	Theory of Financial Decisions	3
BFIN elective		3
		Credits
		6
Spring		
BFIN elective		3
BFIN elective		3
		Credits
		6
		Total Credits
		27

Finance (Entrepreneurial Finance) - Bachelor of Business Administration

Finance is the crossroads of economics, strategy and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in a variety of areas including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, risk management and insurance, and entrepreneurial finance.

Courses in the BBA in Finance are organized into four concentrations: Financial Analyst, Banking and Financial Planning, Risk Management and Insurance, and Entrepreneurial Finance. Students may pursue one or

more concentrations. If a student chooses not to pursue a concentration, they may select four courses from any concentration or any BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
<i>Area I: Communications</i>		
<i>English Composition Level - 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences ²</i>		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective ²</i>		3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements</i>		
MATH 1430G	Applications of Calculus I	3
Choose one from the following (grade of C- or better required):		
If MATH 1350G is taken before MATH 1220G then the Statistics course will Satisfy the Area II Requirement for Gen.Ed and MATH 1220G must be taken as a foundation requirement ¹		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3

BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
BFIN 406	Theory of Financial Decisions	3
<i>Twelve credits from:</i>		12
<i>Entrepreneurial Finance Concentration (12 credits from the following)</i>		
ENTR 331	Business Creation and Valuation	
BLAW 330	Entrepreneurial Law	
BFIN 391	Finance Internship and Cooperative Education I	
BFIN 498	Independent Study	
or		
Four courses from any BFIN prefix above BFIN 310 or from any concentration below, for students not wishing to declare a concentration		
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		13
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 220), College of Business foundation and business core (p. 842), Viewing a Wider World (p. 220) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they

should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any BFIN prefix above BFIN 310.

A Suggested Plan of Study for Students

Junior		
Fall		Credits
BFIN 341	Financial Analysis and Markets	3
BFIN elective		3
Credits		6
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
Credits		9
Senior		
Fall		Credits
BFIN 406	Theory of Financial Decisions	3
BFIN elective		3
Credits		6
Spring		
BFIN elective		3
BFIN elective		3
Credits		6
Total Credits		27

Finance (Financial Analyst) - Bachelor of Business Administration

Finance is the crossroads of economics, strategy and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in a variety of areas including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, risk management and insurance, and entrepreneurial finance.

Courses in the BBA in Finance are organized into four concentrations: Financial Analyst, Banking and Financial Planning, Risk Management and Insurance, and Entrepreneurial Finance. Students may pursue one or more concentrations. If a student chooses not to pursue a concentration, they may select four courses from any concentration or any BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
<i>Area I: Communications</i>		
<i>English Composition Level - 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences ²</i>		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective ²</i>		3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements</i>		
MATH 1430G	Applications of Calculus I	3
Choose one from the following (grade of C- or better required):		
If MATH 1350G is taken before MATH 1220G then the Statistics course will Satisfy the Area II Requirement for Gen.Ed and MATH 1220G must be taken as a foundation requirement ¹		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3

Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)	3
<i>Major Courses</i>	
BFIN 355 Investments	3
BFIN 360 Financial Information Technology	3
BFIN 385 Analysis of Financial Markets and Institutions	3
BFIN 406 Theory of Financial Decisions	3
<i>Twelve credits from:</i>	12
<i>Financial Analyst Concentration (12 credits from the following)</i>	
BFIN 311 Financial Futures Markets	
BFIN 435 Investment Analysis	
BFIN 445 Fixed Income Markets, Instruments and Derivatives	
BFIN 455 Derivative Markets and Securities	
BFIN 470 Real Estate Appraisal	
BFIN 475 International Managerial Finance	
BFIN 391 Finance Internship and Cooperative Education I	
BFIN 498 Independent Study	
or	
Four courses from any BFIN prefix above BFIN 310 or from any concentration below, for students not wishing to declare a concentration	
Second Language: (not required)	
Electives, to bring the total credits to 120 ⁴	13
Total Credits	120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 220), College of Business foundation and business core (p. 842), Viewing a Wider World (p. 220) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any BFIN prefix above BFIN 310.

A Suggested Plan of Study for Students

Junior		
Fall		Credits
BFIN 341 Financial Analysis and Markets	3	
BFIN elective	3	
Credits		6

Spring		
BFIN 355 Investments	3	
BFIN 360 Financial Information Technology	3	
BFIN 385 Analysis of Financial Markets and Institutions	3	
Credits		9
Senior		
Fall		
BFIN 406 Theory of Financial Decisions	3	
BFIN elective	3	
Credits		6
Spring		
BFIN elective	3	
BFIN elective	3	
Credits		6
Total Credits		27

Finance (Risk Management and Insurance) - Bachelor of Business Administration

Finance is the crossroads of economics, strategy and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in a variety of areas including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, risk management and insurance, and entrepreneurial finance.

Courses in the BBA in Finance are organized into four concentrations: Financial Analyst, Banking and Financial Planning, Risk Management and Insurance, and Entrepreneurial Finance. Students may pursue one or more concentrations. If a student chooses not to pursue a concentration, they may select four courses from any concentration or any BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
<i>Area I: Communications</i>		
<i>English Composition Level - 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	

ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
Area III: Laboratory Sciences ²		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
Area V: Humanities ²		3
Area VI: Creative and Fine Arts ²		3
General Education Elective ²		3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements</i>		
MATH 1430G	Applications of Calculus I	3
Choose one from the following (grade of C- or better required):		
If MATH 1350G is taken before MATH 1220G then the Statistics course will Satisfy the Area II Requirement for Gen.Ed and MATH 1220G must be taken as a foundation requirement ¹		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
Choose one of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
BFIN 406	Theory of Financial Decisions	3
<i>Twelve credits from:</i>		12

Risk Management and Insurance Concentration (12 credits from the following)

BFIN 322	Principles of Insurance (Required)
BFIN 323	Life/Health/Employee Benefits
BFIN 324	Property and Liability Insurance
BFIN 326	Business Risk Management
BFIN 421	Personal Financial Planning for Professionals
BFIN 392	Insurance Internship and Cooperative Education I
BFIN 498	Independent Study
or	
Four courses from any BFIN prefix above BFIN 310 or from any concentration below, for students not wishing to declare a concentration	

Second Language: (not required)

Electives, to bring the total credits to 120 ⁴	13
Total Credits	120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 220), College of Business foundation and business core (p. 842), Viewing a Wider World (p. 220) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any FIN prefix above FIN 310.

A Suggested Plan of Study for Students

Junior		
Fall		Credits
BFIN 341	Financial Analysis and Markets	3
BFIN elective		3
Credits		6
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
Credits		9
Senior		
Fall		
BFIN 406	Theory of Financial Decisions	3

BFIN elective	3
Credits	6
Spring	
BFIN elective	3
BFIN elective	3
Credits	6
Total Credits	27

Business Law - Undergraduate Minor

In a world that is increasingly subject to laws and regulations, every business needs employees who are savvy about the laws that affect business. The Business Law minor is comprised of a series of courses designed to provide a strong background in a wide range of laws that business needs to be aware of, and provide students with the ability to recognize – and avoid – legal pitfalls. Additionally, the Business Law minor will provide students with a clear understanding of how legal disputes are resolved and the ability to appreciate the cost and complexity of disputes, and enable students to reduce the costs and complexities by being able to communicate clearly with lawyers about the legal issues.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed in the NMSU College of Business. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies. Students interested in pursuing this minor should contact the Finance Department Head in BC 221 (<https://map.nmsu.edu/?ct/>).

Prefix	Title	Credits
Required Courses		
BLAW 316	Legal Environment of Business	3
BLAW 313	Sports and the Law	3
BLAW 385V	Employment and Consumer Law	3
BLAW 330	Entrepreneurial Law	3
Take any 2 courses from the following:		6
BLAW 325	Real Estate Principles and Law I	
HRTM 304	Hospitality and Travel Law	
AEEC 314	Agricultural and Natural Resource Law	
HNRS 335V	Legal Issues in Modern Society	
POLS 391	Constitutional Law	
Total Credits		18

Entrepreneurship and Innovation (Business Cluster) - Undergraduate Minor

The Entrepreneurship and Innovation minor is designed to promote entrepreneurship to students across the NMSU campus. This minor will appeal to creative and ambitious students who envision launching and managing their own business or entering careers in innovation-driven fields. The flexible design allows students to complete a designated, approved cluster of related courses that provide a discipline-specific entrepreneurial flavor. Such clusters are under development.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed in the NMSU College of Business. This minor is not open to students in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Core Courses		
ENTR 331	Business Creation and Valuation	3
MGMT 310V	Entrepreneurial Mindset	3
BLAW 330	Entrepreneurial Law	3
Business Cluster Courses: Choose any 3 from the following		9
B A 490	Selected Topics	
MKTG 312	Personal Selling	
MKTG 324	Product/Service Development	
Total Credits		18

Finance - Undergraduate Minor

The minor in Finance, available to students in most majors (business and non-business), affords students the opportunity to select their minor courses to provide a focus on any one of several sub-specialties within the field of Finance. Faculty advisors in the department can assist students in selecting their Finance electives to provide a focus in financial management, financial planning, or investments. (This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.)

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses and a minimum cumulative GPA of 2.0 in the BFIN courses. At least twelve credits for the minor must be completed in the NMSU College of Business.

Prefix	Title	Credits
Required Courses		
ACCT 2110	Principles of Accounting I	3
BFIN 341	Financial Analysis and Markets	3
Select any three additional, upper division, finance courses ¹		9
Select any additional upper division business course		3
Select one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Total Credits		21

¹ Upper division Finance courses must have a number greater than 310.

Risk Management and Insurance - Undergraduate Minor

The minor in Insurance, available to students in most majors (business and non-business), affords students the opportunity to supplement their major field of study with specialized expertise in the field of risk management and insurance.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed in the NMSU College of Business. The minor is not available to students in the Bachelor of Individualized Studies or the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
BFIN 322	Principles of Insurance	3
BFIN 341	Financial Analysis and Markets	3
or BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
BLAW 316	Legal Environment of Business	3
or BLAW 385V	Employment and Consumer Law	
Any three upper division finance courses chosen from the following.		9
BFIN 323	Life/Health/Employee Benefits	
BFIN 324	Property and Liability Insurance	
BFIN 326	Business Risk Management	
BFIN 392	Insurance Internship and Cooperative Education I	
BFIN 498	Independent Study	
BFIN 421	Personal Financial Planning for Professionals ¹	
Total Credits		18

¹ BFIN 421 Personal Financial Planning for Professionals cannot be taken if BFIN 303V Personal Financial Planning and Investing in a Global Economy is applied toward the minor.

Management

Undergraduate Program Information

The major in general business is based on a broad range of course options rather than a narrow focus on a single discipline. Graduates find careers in large and small businesses, in government agencies and in the nonprofit sector. The general business major is well suited to the part-time and working student because it allows the student to select courses that will better meet their individual schedule. The entrepreneurship concentration is ideal for a student interested in starting or acquiring a small business or entering a family business upon graduation. The curriculum provides a focus on small and new enterprises, thus reflecting the entrepreneurial nature of contemporary business in the U.S.

The Department of Management invites you to consider a major in management. Do you like to work with people? Need help solving people problems at work? Hope to start your own business? Want to run an environmental project, or a bank, a store, a farm or a government agency? Are you interested in how people from diverse backgrounds work together to achieve common goals? If you answered yes to any of these questions, you should consider a major in management. The mission of the department is to prepare graduates, with a Bachelor of Business Administration, for management careers in a broad spectrum of New Mexico, national and globally oriented businesses. Management graduates work in small and large agricultural, manufacturing, government, transportation, public utility, merchandising, health care, environmental and communications organizations among others.

The study of management offers the opportunity to develop skills in utilizing human, physical and economic resources to achieve

organizational objectives. These are important cross-functional skills in today's competitive job market. Students will acquire the skills and knowledge to develop their potential and to lead others in a common mission. Management majors may choose from program concentrations in human resource management, project and supply chain management or small business management and entrepreneurship.

Degrees for the Department

Bachelor Degree(s)

- General Business (Entrepreneurship) - Bachelor of Business Administration (p. 894)
- General Business - Bachelor of Business Administration (p. 892)
- General Business - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/general-business-bba-online/>)
- Management (Human Resource Management) - Bachelor of Business Administration (p. 896)
- Management (Project & Supply Chain Management) - Bachelor of Business Administration (p. 898)
- Management (Small Business Management & Entrepreneurship) - Bachelor of Business Administration (p. 900)

Doctoral Degree(s)

- Business Administration (Management) - Doctor of Philosophy (p. 180)

Minors for the Department

- Management - Undergraduate Minor (p. 902)

Carlo A. Mora-Monge, Ph.D., Interim Department Head

Professors Bishop, Flinchbaugh, Hoffman, Jun; **Assistant Professors** Pimentel; **College Professor** Driver; **College Assistant Professor** Ortiz

J. Bishop, Ph.D. (Virginia Polytechnic Institute and State University) - Organizational Behavior, Research Methods; M. Driver, Ph.D. (University of Alabama) - Human Resource Management, Ethics; C. Flinchbaugh, Ph.D. (University of Kansas) - Human Resource Management, Organizational Behavior; J. Hoffman (University of Nebraska) - Strategic Management, Entrepreneurship; M. Jun, Ph.D. (Georgia State University) - Supply Chain Management, Operations Management; L. Ortiz, Ph.D. (University of Texas-Pan American) - Human Resource Management, Small Business Management; V. Pimentel, Ph.D. (Washington State University) - Operations Management, Supply Chain Management.

Management Courses

MGMT 2110. Principles of Management

3 Credits (3)

An introduction to the basic theory of management including the functions of planning, organizing, staffing, leading, and controlling; while considering management's ethical and social responsibilities.

Learning Outcomes

1. Explain the major functions of management including planning, organizing, communications, controlling, motivating, leading, and staffing.
2. Recognize major developments in the history of management thought.
3. Describe the basic managerial processes including decision-making and other key skills necessary for managers to perform their roles.
4. Identify an organization's stakeholders and the importance of social and ethical responsibility of managers.
5. Explain the formulation and implementation of strategic planning, including the relationship between goals, plans, vision statements, and mission statements.
6. Describe the strategies managers use to help organizations adapt to changing internal and external environments.
7. Explain organizational change, forces for change, sources of resistance to change, and the techniques managers can use to implement and facilitate change.

MGMT 309. Human Behavior in Organizations

3 Credits (3)

Interpersonal and organizational behavior, motivation, communication, team building, leadership, diversity management, legal and ethical issues, and politics in organizations. Credit may not be earned for both MGMT 309 and MGMT 315V.

MGMT 310V. Entrepreneurial Mindset

3 Credits (3)

This course provides the opportunity to learn to think like an entrepreneur in the broader context of social entrepreneurship, intrapreneurship, creative problem solving, opportunity recognition, and innovation.

MGMT 332. Human Resources Management

3 Credits (3)

Survey course in human resources management. Includes recruitment, selection, equal employment opportunity, performance appraisal, training, compensation, safety, and union-management relations.

MGMT 333. Training and Development

3 Credits (3)

Training and development of human resources, including training needs assessment, training approaches and techniques, and evaluation of training effectiveness.

MGMT 335V. Business and Government

3 Credits (3)

Crosslisted with: ECON 335G

MGMT 344. Production and Operations Management

3 Credits (3)

Management of physical and human resources; management information systems in operations; applications in various organizations.

Prerequisite: MATH 1350G or A ST 311; and BCIS 338 or BCIS 350.

MGMT 345V. Quality and Competitiveness: An International Perspective **3 Credits (3)**

Quality management and competitiveness are studied in manufacturing, services, and the public sector with an international perspective. Topics include: global history of quality, foreign competition and its impact on quality and productivity, quality management and continuous improvement, international operations management, quality assessment, and a review of the emergence of quality and competitiveness in government, education and health care. May be repeated up to 3 credits.

Learning Outcomes

1. Developing critical thinking skills through challenging material and assignments.
2. Foster intelligent inquiry through assignments, participative lectures, team projects.
3. Develop an integration and synthesis of knowledge through applications to case studies and individual assignments.
4. Promote a breadth of knowledge on international developments in quality and competitiveness with a holistic view of quality and its impact on businesses, organizations, nations and individuals.

MGMT 347. Management Functions and Processes

3 Credits (3)

Planning, organizing, directing, and controlling operating units in an organization. Applications to a variety of types of organizations.

MGMT 351. Supply Chain Management

3 Credits (3)

Acquisition and control and delivery of materials, parts, equipment, and services for end use in the organization. Applications to service and manufacturing industries, nonprofit, and governmental institutions.

MGMT 361. Small Business Management

3 Credits (3)

Principles and practice of managing a small enterprise with emphasis on growth and performance.

MGMT 388V. Leadership and Ethics

3 Credits (3)

Exploration of the multifaceted nature of leadership and principal-based ethics in modern society through readings and seminar discussion. May be repeated up to 3 credits.

MGMT 391. Management Internship and Cooperative Education I

1-3 Credits

Application of management skills to the work environment. Open only to students majoring or minoring in management. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

Prerequisites: MGMT 309 and consent of instructor.

MGMT 448. Small Business Consulting

3 Credits (3)

Study analysis and presentation of recommendations for solving significant problems confronting small businesses.

Prerequisite(s): Senior standing or consent of instructor.

MGMT 449. Strategic Management

3 Credits (3)

Integrative approach to envisioning the future and shaping strategies for business success.

Prerequisite(s): BCIS 338 or BCIS 350; BLAW 316; BFIN 341; MGMT 309; MKTG 303; and one of the following: MGMT 344 or MGMT 470 or BCIS 485.

MGMT 451. Selection, Placement, and Performance Evaluation**3 Credits (3)**

Staffing processes for organizations and the evaluation of employee performance. Use of selection methods and measurement of work behavior.

MGMT 453. Leadership and Motivation**3 Credits (3)**

Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Crosslisted with: I E 453

MGMT 454. Work Teams in Organizations**3 Credits (3)**

Theories of small groups and their application to the work situation. Why and how groups form, grow, communicate, and maintain themselves.

Prerequisites: senior or above standing.

MGMT 458. Comparative International Management**3 Credits (3)**

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as I B 458.

MGMT 460. Compensation Management**3 Credits (3)**

An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration.

Prerequisite(s): MGMT 332 or consent of instructor.

MGMT 461. Seminar in Entrepreneurship**3 Credits (3)**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MKTG 461.

Prerequisite(s): Senior standing or consent of instructor.

MGMT 465. Contemporary Issues in Human Resources Management**3 Credits (3)**

Integrative course in human resources management, emphasizing the application of advanced concepts to complex personnel cases.

Prerequisite: MGMT 332.

MGMT 470. Project Management in Organizations**3 Credits (3)**

Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.

MGMT 490. Selected Topics**1-18 Credits (1-18)**

Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.

MGMT 491. Management Internship and Cooperative Education II**1-3 Credits**

Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

Prerequisite: MGMT 309 and consent of instructor.

MGMT 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

MGMT 502. Operations Management**3 Credits (3)**

Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources.

Prerequisite(s): Graduate students only.

MGMT 503. Organizational Behavior and Management Processes**3 Credits (3)**

Covers the theory and practice related to the successful management of human resources in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory.

Prerequisite: graduate students only.

MGMT 512. Quantitative Analysis for Business Decisions**3 Credits (3)**

Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making.

Prerequisite: graduate students only.

MGMT 548. Small Business Consulting**3 Credits (3)**

Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGMT 448 with differentiated assignments for graduate students.

Prerequisite(s): Graduate standing.

MGMT 590. Strategic Management**3 Credits (3)**

Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Restricted to majors.

Prerequisite: M.B.A. student in his or her final semester.

MGMT 591. Seminar in Entrepreneurship**3 Credits (3)**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.

Prerequisite(s): Graduate standing.

MGMT 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 6 credits may be earned.

Prerequisite: consent of instructor.

MGMT 600. Doctoral Research**1-15 Credits (1-15)**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

Restricted to management majors. May be repeated up to 88 credits.

MGMT 601. Research in Management
1 Credit (1)

Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.

MGMT 640. Instructional Development for Teaching Business
3 Credits (3)

Pedagogical issues and techniques in collegiate business education. Includes course and curriculum development, outcomes assessment, class management, and teaching techniques. Practical issues faced in college instruction. Restricted to doctoral students.

MGMT 645. Seminar in Human Resources Management
3 Credits (3)

Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 650. Seminar in Organizational Behavior
3 Credits (3)

Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students. May be repeated up to 3 credits.

Learning Outcomes

- 1. Varies

MGMT 655. Seminar in Organizational Systems and Theory
3 Credits (3)

Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 660. Research Design and Methodology
3 Credits (3)

Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students. May be repeated up to 3 credits.

Learning Outcomes

- 1. Varies

MGMT 661. Qualitative Research Methods
3 Credits (3)

In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action research, and ethnomethodology. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 670. Seminar in Operations Management
3 Credits (3)

Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology. Restricted to Doctoral students. May be repeated up to 3 credits.

MGMT 675. Seminar in Strategic Management
3 Credits (3)

Survey of current and classical readings in strategy. Introduces the doctoral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 685. Story Consulting to Organizations
3 Credits (3)

Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact)intervention with a local consenting organization. Restricted to doctoral students.

MGMT 690. Special Topics
3 Credits (3)

Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students.

Prerequisite(s): Vary according to seminar being offered.

MGMT 698. Special Topics
1-3 Credits

Prerequisite: consent of instructor.

MGMT 700. Doctoral Dissertation
1-15 Credits (1-15)

May be repeated up to 88 credits.

Prerequisite: advancement to candidacy.

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Phone: (575) 646-1201

Website: <http://business.nmsu.edu/departments/mgt/> (<https://business.nmsu.edu/>)

General Business - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grade of C- or better are required in general education communication courses		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		3
ENGL 2210G	Professional & Technical Communication	
<i>Oral Communication</i>		
Choose one from the following:		3

ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		3
MATH 1220G	College Algebra ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics (C- or better)	
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		3
MATH 1430G	Applications of Calculus I ¹	
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning	3
or MGMT 344	Production and Operations Management	
or MGMT 470	Project Management in Organizations	
Upper Division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
Major requirements (upper division business courses) ⁴		24
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following (grade of C- or better required):		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		16
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) Section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

⁴ No more than 9 credits may be taken in any one prefix

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Note: The general business option is offered through a 2+2 Online Distance Education Degree Completion Program as well. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs> (<https://business.nmsu.edu/academic-programs/undergraduate-programs/online-undergraduate-program.html>)

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose from one of the following: ¹		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (for multicultural/international students only and a C- or better) ¹	
Area V: Humanities Course ²		3
Elective Course		3
Credits		16

Semester 2

COMM 1115G	Introduction to Communication (C- or better)	3
MATH 1430G	Applications of Calculus I ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year**Semester 1**

ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
MATH 1350G	Introduction to Statistics (C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Elective Course		3
Credits		15

Semester 2

ECON 2120G	Principles of Microeconomics (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better)	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course ³		3
Credits		15

Third Year**Semester 1**

BCIS 338	Business Information Systems I ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Credits		15

Semester 2

Choose from one of the following:		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations ¹	
BCIS 485	Enterprise Resource Planning ¹	
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
VWW: Viewing a Wider World Course ³		3
Elective Course		3
Credits		15

Fourth Year**Semester 1**

Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
ECON Upper-Division Elective Course		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Elective Course		3
Credits		15

Semester 2

MGMT 449	Strategic Management ¹	3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Elective Course(s)		4
Credits		13
Total Credits		120

¹ These courses have prerequisites and it is the student's responsibility to check and fulfill all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ No more than 9 credits may be taken in any one prefix

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

General Business (Entrepreneurship) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		3
MATH 1220G	College Algebra ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		3
MATH 1430G	Applications of Calculus I ¹	
Viewing A Wider World ³		6

Departmental/College Requirements*Business Core: Lower Division (minimum grades of C- required)*

ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3

Business Core: Upper Division

BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning	3
or MGMT 344	Production and Operations Management	
or MGMT 470	Project Management in Organizations	

Upper Division Economics or Applied Statistics elective from the following prefixes (excluding A ST 311), ECON 3

Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311) 3

Major Courses

MGMT 332	Human Resources Management	3
MGMT 361	Small Business Management	3
MGMT 461	Seminar in Entrepreneurship	3
MGMT 448	Small Business Consulting	3
Major requirements (upper division) ⁴		12

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

Choose one from the following (grade of C- or better required): 3

If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement¹

MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	

Second Language: (not required)**Electives, to bring the total credits to 120⁵** 16**Total Credits** 120¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.² See the General Education (p. 220) Section of the catalog for a full list of courses³ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses⁴ **Of the remaining 12 credits for the entrepreneurship concentration, no more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)

- Management (MGT)
- Marketing (MKTG)

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose from one of the following: ¹		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities Course ²		3
Elective Course		3
Credits		16

Semester 2		
COMM 1115G	Introduction to Communication (C- or better)	3
MATH 1430G	Applications of Calculus I (C- or better) ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Area III: Laboratory Science ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Semester 1		
ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
MATH 1350G	Introduction to Statistics (C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Elective Course		3
Credits		15

Semester 2		
ECON 2120G	Principles of Microeconomics (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better)	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course ³		3
Credits		15

Third Year

Semester 1		
BCIS 338	Business Information Systems I ¹	3

BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
MGMT 332	Human Resources Management	3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Credits		15
Semester 2		
Choose from any of the following:		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations ¹	
BCIS 485	Enterprise Resource Planning ¹	
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
VWW: Viewing a Wider World Course ³		3
Elective Course		3
Credits		15
Fourth Year		
Semester 1		
MGMT 361	Small Business Management	3
ECON Upper-Division Elective Course		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Any Upper-Division Business Elective Course (excluding A ST 311) ⁴		3
Elective Course		3
Credits		15
Semester 2		
MGMT 449	Strategic Management ¹	3
MGMT 448	Small Business Consulting	3
MGMT 461	Seminar in Entrepreneurship	3
Elective Course(s)		4
Credits		13
Total Credits		120

¹ These courses have prerequisites and it is the student's responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ **Of the remaining 12 credits for the entrepreneurship concentration, no more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

Management (Human Resource Management) - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives. Students will choose one or more of the four options that follow.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics (C- or better)	
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
<i>Area V: Humanities ²</i>		
<i>Area VI: Creative and Fine Arts ²</i>		
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement)	3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements ⁴</i>		
Choose one from the following (grade of C- or better required):		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		
MATH 1350G	Introduction to Statistics (Foundation Requirement)	

A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning	3
or MGMT 344	Production and Operations Management	
or MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
MGMT 332	Human Resources Management	3
MGMT 333	Training and Development	3
MGMT 451	Selection, Placement, and Performance Evaluation	3
MGMT 460	Compensation Management	3
BCIS 461	Business Analytics I	3
MGMT Upper Division Electives		9
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		16
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

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in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year			
Fall			Credits
MATH 1220G	College Algebra (C- or better) ¹		3
BCIS 1110	Introduction to Information Systems		3
Choose one from the following:			4
ENGL 1110G	Composition I (C- or better) ¹		
ENGL 1110H	Composition I (C- or better) ¹		
ENGL 1110M	Composition I (C- or better) ¹		
Area V: Humanities Course ²			3
Elective Course ³			3
		Credits	16
Spring			
MATH 1430G	Applications of Calculus I ¹		3
BUSA 1110	Intro to Business		3
Choose one from the following:			3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)		
COMM 1115G	Introduction to Communication (C- or better)		
COMM 1130G	Public Speaking (C- or better)		
HNRS 2175G	Introduction to Communication Honors (C- or better)		
Area III: Laboratory Science Course ²			4
Area VI: Creative and Fine Arts Course ²			3
		Credits	16
Second Year			
Fall			
Elective Course ³			3
ECON 2110G	Macroeconomic Principles (counts towards Area IV, Gen.Ed) ¹		3
ACCT 2110	Principles of Accounting I		3
ENGL 2210G	Professional & Technical Communication (C- or better) ¹		3
Elective Course ³			3
		Credits	15
Spring			
Choose one from the following:			3
MATH 1350G	Introduction to Statistics ¹		
A ST 311	Statistical Applications ¹		
ECON 2120G	Principles of Microeconomics (counts towards Area IV, Gen. Ed) ¹		3
ACCT 2120	Principles of Accounting II ¹		3
Elective Course ³			4
VWW - Viewing a Wider World Course ⁴			3
		Credits	16
Third Year			
Fall			
MGMT 332	Human Resources Management		3
BCIS 338	Business Information Systems I ¹		3
MKTG 303	Principles of Marketing		3
MGMT 309	Human Behavior in Organizations		3
MGT Upper Division Elective Course			3
		Credits	15

Spring

BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGT Upper Division Elective Course		3
MGT Upper Division Elective Course		3
VWW - Viewing a Wider World ⁴		3

Credits **15**

Fourth Year**Fall**

BCIS 461	Business Analytics I (typically offered in Fall only) ¹	3
MGMT 451	Selection, Placement, and Performance Evaluation (typically offered in Fall only) ¹	3
Choose one from the following: ⁵		3
MGMT Upper Division Elective Course		
MGMT 333	Training and Development (typically offered in Fall only)	
Choose one from the following:		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations ¹	
BCIS 485	Enterprise Resource Planning ¹	
ECON or A ST Upper-Division Elective Course (excluding A ST 311)		3

Credits **15**

Spring

MGMT 460	Compensation Management (typically offered in Spring only) ¹	3
Choose one from the following: ⁵		3
MGMT Upper Division Elective Course		
MGMT 465	Contemporary Issues in Human Resources Management (typically offered in Spring only) ¹	
MGMT 449	Strategic Management ¹	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3

Credits **12**

Total Credits **120**

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Students who choose to take MGMT 333 Training and Development during Year 4-Fall will take a 3-credit MGT upper-division elective in Year 4-Spring. Students who choose to take a 3-credit MGMT upper-division elective during Year 4-Fall will take MGMT 465 Contemporary Issues in Human Resources Management during Year 4-Spring.

Management (Project & Supply Chain Management) - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives. Students will choose one or more of the four options that follow.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics (C- or better)	
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement (Majors in Economics and International Business must earn a grade of at least C-))	3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements ⁴</i>		
Choose one from the following (grade of C- or better required):		3

If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹

MATH 1350G	Introduction to Statistics (Foundation Requirement)	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning (counts as a major course also)	3
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
<i>Major Courses</i>		
MGMT 332	Human Resources Management	3
MGMT 344	Production and Operations Management	3
MGMT 351	Supply Chain Management	3
BCIS 461	Business Analytics I	3
MGMT 470	Project Management in Organizations	3
<i>MGMT Upper Division Electives</i>		9
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		16
Total Credits		120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement

in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities Course ²		3
Elective Course ³		3
Credits		16

Spring

MATH 1430G	Applications of Calculus I ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Fall		Credits
Elective Course ³		3
ECON 2110G	Macroeconomic Principles (counts towards Area IV, Gen.Ed and C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
Elective Course ³		3
Credits		15

Spring

Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better) ¹	
ECON 2120G	Principles of Microeconomics (counts towards Area IV, Gen. Ed, and C- or better) ¹	3
ACCT 2120	Principles of Accounting II (C- or better) ¹	3
Elective Course ³		4
VWW - Viewing a Wider World Course ⁴		3
Credits		16

Third Year

Fall		Credits
MGMT 332	Human Resources Management	3
MGT Upper Division Elective Course		3
BCIS 338	Business Information Systems I ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
Credits		15

Spring

MGMT 344	Production and Operations Management ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
MGMT Upper-Division Elective Course		3
VWW - Viewing a Wider World ⁴		3

Credits **15**

Fourth Year**Fall**

MGMT 351	Supply Chain Management	3
BCIS 461	Business Analytics I (typically offered in Fall only) ¹	3
BCIS 485	Enterprise Resource Planning ¹	3
ECON or A ST Upper-Division Elective Course (excluding A ST 311)		3
Elective Course ³		3

Credits **15**

Spring

MGT Upper-Division Elective Course		3
MGMT 470	Project Management in Organizations	3
MGMT 449	Strategic Management ¹	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3

Credits **12**

Total Credits **120**

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Management (Small Business Management & Entrepreneurship) - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives. Students will choose one or more of the four options that follow.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
ENGL 1110M	Composition I	
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (Foundation Requirement) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics (C- or better)	
<i>Area III: Laboratory Sciences Course (4 credits) ²</i>		
<i>Area V: Humanities ²</i>		3
<i>Area VI: Creative and Fine Arts ²</i>		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement)	3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Foundation Requirements ⁴</i>		
Choose one from the following (grade of C- or better required):		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement ¹		
MATH 1350G	Introduction to Statistics (Foundation Requirement)	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
<i>Business Core: Lower Division (minimum grades of C- required)</i>		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning	3
or MGMT 344	Production and Operations Management	

Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)	3
<i>Major Courses</i>	
MGMT 332 Human Resources Management	3
MGMT 310V Entrepreneurial Mindset	3
MGMT 361 Small Business Management	3
MGMT 448 Small Business Consulting	3
MGMT 470 Project Management in Organizations	3
BLAW 330 Entrepreneurial Law	3
MKTG 324 Product/Service Development	3
or MKTG 357 Internet and Social Media Marketing	3
<i>MGMT Upper Division Elective</i>	3
Second Language: (not required)	
Electives, to bring the total credits to 120⁵	16
Total Credits	120

¹ Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses and how to fulfill this requirement.

⁴ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G or A ST 311 must be completed.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

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First Year

Fall		Credits
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) ¹	
ENGL 1110H	Composition I (C- or better) ¹	
ENGL 1110M	Composition I (C- or better) ¹	
Area V: Humanities Course ²		3

Elective Course ³		3
Credits		16
Spring		
MATH 1430G	Applications of Calculus I ¹	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Fall		
Elective Course ³		3
ECON 2110G	Macroeconomic Principles (counts towards Area IV, Gen.Ed and C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
Elective Course ³		3
Credits		15
Spring		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (C- or better) ¹	
A ST 311	Statistical Applications (C- or better) ¹	
ECON 2120G	Principles of Microeconomics (counts towards Area IV, Gen. Ed, and C- or better) ¹	3
ACCT 2120	Principles of Accounting II (C- or better) ¹	3
Elective Course ³		4
VWW - Viewing a Wider World Course ⁴		3
Credits		16

Third Year

Fall		
MGMT 332	Human Resources Management	3
MKTG 324	Product/Service Development	3
or MKTG 357	or Internet and Social Media Marketing	
BCIS 338	Business Information Systems I ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
Credits		15
Spring		
MGMT 361	Small Business Management	3
MGMT 310V	Entrepreneurial Mindset	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
VWW - Viewing a Wider World ⁴		3
Credits		15

Fourth Year

Fall		
MGMT 448	Small Business Consulting ¹	3
BLAW 330	Entrepreneurial Law	3
Choose one from the following:		3
BCIS 485	Enterprise Resource Planning ¹	

MGMT 344	Production and Operations Management ¹	
ECON or A ST Upper-Division Elective Course (excluding A ST 311)		3
Elective Course ³		3
Credits		15
Spring		
MGMT 470	Project Management in Organizations	3
MGMT 449	Strategic Management ¹	3
MGMT Upper-Division Elective Course		3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
Credits		12
Total Credits		120

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Management - Undergraduate Minor

The management minor requires 18 upper division credits in management. Business majors must take any six upper-division management courses (3 credits each). The management minor for non-business majors consists of:

Prefix	Title	Credits
MGMT 309	Human Behavior in Organizations	3
Select five other upper division Management courses ¹		15
Total Credits		18

¹ One 3-credit upper division course in the College of Business may substitute for one of the required five management courses.

At least 12 credits for the minor must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

To obtain a Management minor, a grade of C- or better must be attained in the courses required.

Marketing

Undergraduate Program Information

Marketing majors learn skills and knowledge relevant to the co-creation of goods, services, and ideas that uniquely meet the needs and wants of global customer markets and society at large. Career opportunities exist in marketing management, advertising, market research, promotion management, sales and sales management, social media, distribution

management, and retailing. The major is designed to allow a great deal of choice so students may emphasize any combinations of these areas.

Most marketing majors enter into careers in business firms, although some find job opportunities in governmental and other nonprofit organizations. Still others become involved in owning and managing their own companies. Opportunities in entrepreneurship and small business are expanding at a rapid pace.

Graduate Program Information

The College offers a program leading to a Ph.D. degree (Doctor of Philosophy in Business Administration) (p. 180). The faculty of the Ph.D. Program in Business Administration is committed to training researchers and educators who will shape business scholarship, practice, and pedagogy. The program emphasizes preparing candidates to understand the complexities of modern business while they develop a specialized area of expertise in marketing or management. The Ph.D. in Business Administration provides graduates with the opportunity to pursue a variety of career paths within academia and within industry. Currently a concentration is offered in marketing.

Degrees for the Department

Bachelor Degree(s)

- Marketing (Advertising) - Bachelor of Business Administration (p. 910)
- Marketing (PGA Golf Management) - Bachelor of Business Administration (p. 911)
- Marketing (Professional Selling) - Bachelor of Business Administration (p. 913)
- Marketing (Strategic Marketing) - Bachelor of Business Administration (p. 915)
- Marketing - Bachelor of Business Administration (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/marketing-bba-online/>)

Doctoral Degree(s)

- Business Administration (Marketing) - Doctor of Philosophy (p. 180)

Minors for the Department

- Advertising - Undergraduate Minor (p. 917)
- Marketing - Undergraduate Minor (p. 917)
- Professional Selling - Undergraduate Minor (p. 917)

Professor, David Daniel, Department Head

Professors Hyman, Jasso, Niculescu; **Associate Professor** Zhu; **Assistant Professors** Lavoie, Manis; **College Professors** Blaugrund, Gavin; **College Assistant Professor** Holguin, Shabazz; **Emeritus Professor** Sautter

Marketing Courses

MKTG 1210. Advertising

3 Credits (3)

A survey of currently available advertising media. A psychological approach to consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures.

Prerequisite: MKTG 2110.

Learning Outcomes

1. Define advertising and the relevant application of psychology in delivering the message.
2. Explain the importance of various advertising media in the marketing mix.
3. Identify and explain the social, ethical and legal issues advertisers must consider.
4. Describe the significance of the marketing function in business.
5. Explain the importance of advertising and other marketing communication tools.
6. Demonstrate application of the planning process as it applies to marketing and advertising.
7. Describe the factors that are weighted when considering the use of radio and television in the creative advertising mix.
8. Describe the relationship between market segment, consumer behavior and selection of advertising campaign types.
9. List the alternative means of reaching a target market and the technical challenges of each.

MKTG 1220. Small Business Marketing

3 Credits (3)

An overview of public relations principles, practices and purposes as applied to small business. Topics include basics of news release writing, media awareness, development and maintenance of a positive public image, branding, ethical marketing, and the relationships of public relations with advertising and marketing. Methods and practices used in small business are explored.

Prerequisite: MKTG 2110.

Learning Outcomes

1. Explain the importance of creating and sustaining a positive public awareness and image.
2. Identify public relations practices as they relate to the management and marketing processes.
3. Define branding and discuss its importance for small business.
4. Describe the value of business event management and promotion for small business.
5. Discuss how media relations, public relations, advertising and marketing efforts are interrelated and the importance of each.

MKTG 180. Level 1, PGA's PGM Education Program (Part 1)

3 Credits (3)

Level 1 Part 1 of the PGA PGM Education Program. Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America. Students will complete the PGA Qualifying Level, Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), and the corresponding Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 181. Level 1, PGA's PGM Education Program (Part 2)

3 Credits (3)

Level 1 Part 2 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 1, the corresponding PGA Work Experience Activities, and PGA Teaching Seminars. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

Learning Outcomes

1. Know how students learn and process golf knowledge and skills, and identify the implications for teaching
2. Know how to define and distinguish between learning and performance
3. Understand how juniors learn golf knowledge and skills, and identify implications for teaching
4. Conduct a physical evaluation of a junior golfer and create developmentally appropriate exercise and training programs
5. Establish student/teacher relationships that promote greater student learning and enjoyment
6. Develop a communication style that fits the student and increases instructional effectiveness
7. Analyze student's instructional needs and set clear, purposeful learning and practice goals
8. Know the format for an effective golf lesson
9. Deliver effective explanations and demonstrations during a golf lesson 1
10. Engage in self-assessment of teaching skills and competencies 1
11. Recognize the appropriate clubhead path and clubface position information to improve a golfer's performance 1
12. Conduct appropriate assessments to determine the short game skill level of the golfer 1
13. Gain understanding of the short game elements to help lower scores and improve the player 1
14. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Define what information is require to properly assess a player's golf equipment 1
15. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Observe a player's swinging motion, ball flight, and equipment to evaluate the effectiveness of their equipment

MKTG 2110. Principles of Marketing**3 Credits (3)**

Survey of modern marketing concepts and practices focusing on the marketing mix: product, pricing, promotion, and distribution strategies. Topics include: the marketing environment, consumer behavior, marketing research, target marketing, and the ethical and social responsibilities of marketers. May be repeated up to 6 credits.

Prerequisite: BUSA 1110.

Learning Outcomes

1. Describe the professional, ethical, and social responsibilities of marketers.
2. Explain the role of the product in the marketing mix, including the product life cycle, the relevance of product innovation, and product classifications.
3. Illustrate the role of promotion in the marketing mix, including the communication process and the promotional mix.
4. Explain the role of price in the marketing mix, including pricing objectives, pricing policies, and pricing methods.
5. Describe the operation of channels of distribution and supply chains, including functions of intermediaries and degrees of coverage.
6. Define the concepts of target markets and market segmentation with respect to elements of the marketing mix.
7. Explain the importance of market research and information systems in supporting marketing decision making.
8. Describe the dynamic environment(s) in which marketing decisions must be made.

MKTG 2220. Digital Marketing**3 Credits (3)**

This course focuses on planning to create and market a website. Internal marketing topics such as registering with search engines, increasing traffic, segmenting and targeting markets, establishing an online presence, developing a marketing plan and reshaping business for the Web market are covered.

Prerequisite: MKTG 2110.

Learning Outcomes

1. Describe how search engines work. (Use knowledge to make recommendations to a website on how it can improve its organic search rankings - perform search engine optimization).
2. Describe the various methods of online display advertising.
3. Determine the appropriate key performance indicators (KPIs) for any type of website.
4. Describe and implement best practices in marketing to a database of current and potential customers via email.
5. Utilize knowledge of social media tactics to design an effective social media campaign.
6. Implement online reputation management tactics to improve the online reputation of a brand.
7. Develop and present a digital marketing plan for a small, local business.

MKTG 280. Level 1, PGA's PGM Education Program (Part 3)**3 Credits (3)**

Level 1 Part 3 of the PGA PGM Education Program. This class will focus on Facility Management 1B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), Level 1 Checkpoint Exams, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 281. Level 2, PGA's PGM Education Program (Part 1)**3 Credits (3)**

Level 2 Part 1 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 2, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

Learning Outcomes

1. Explain how students learn golf knowledge and skills, and identify the implications for teaching
2. Explain how students process information when learning golf skills
3. Identify and explain the principles of effective practice
4. Explain how juniors learn golf knowledge and skills, and identify the implications for teaching
5. Structure an effective golf lesson
6. Analyze student's instructional needs and set clear, purposeful learning and practice goals
7. Deliver effective explanations and demonstrations during a golf lesson
8. Engage in self-assessment of teaching skills and competencies
9. Recognize and apply the appropriate clubhead path and clubface position information to improve a golfer's performance 1
10. Conduct appropriate assessments to determine the skill level of the golfer 1
11. Demonstrate basic knowledge of anatomy and physiology, and conduct a physical observation to identify movement capabilities and limitations that may affect a golfer's performance 1
12. Define club performance terms and specifications, and describe their effect on ball flight and player performance

MKTG 303. Principles of Marketing**3 Credits (3)**

Process, functions, and principles in the current marketing system.

Learning Outcomes

1. Understand primary and changing perspectives on marketing and strategic management.
2. Understand the fundamental principles and theories of marketing.
3. Develop the capacity to obtain and process relevant information and analytical skills.
4. Evaluate the impact of interactive media on marketing management.
5. Apply relevant marketing concepts and analytical tools, identify viable alternatives, make informed choices, and recommend marketing implementation plans.
6. Develop skills in organizing more effective strategic marketing and in implementing the market planning process.
7. Develop, evaluate, and implement marketing management strategies in complex environments through recent, popular case study analyses.
8. Formulate marketing management strategies on critical issues, problems, and business opportunities.
9. Broaden perspectives of ethics and social responsibility, keep abreast of global developments, and adapt to changing environments.

MKTG 305. Marketing and Food Agricultural Products**3 Credits (3)**

This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. May be repeated up to 3 credits.

Crosslisted with: AEEC 305.

Prerequisite(s): ECON 1110G or ECON 2120G.

Learning Outcomes

1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations
4. Know the basic outline and components of a marketing plan

MKTG 310. Marketing Research**3 Credits (3)**

Design, collection analysis, and presentation of research data.

Prerequisites: MATH 1350G or A ST 311, and MKTG 303, or consent of instructor.

Learning Outcomes

1. Translate a marketing problem into a feasible research question.
2. Recognize marketing research as a process that involves a sequence of activities, each compatible with the preceding activities.
3. Compare and contrast alternative research designs.
4. Identify the sources of marketing information and the various means for gathering such information.
5. Recognize the biases and limitations of marketing data and basic data analysis.
6. Interpret univariate and basic bivariate data analysis techniques (i.e., should be able to decide when a technique is appropriate and recognize the managerial implications of analytical results).
7. Design and execute a basic survey research project.
8. Assess ethical issues associated with various research approaches.

MKTG 311V. Consumer Behavior**3 Credits (3)**

The different aspects of consumer behavior and the variables affecting consumer decisions. Analysis of current concepts and models.

Learning Outcomes

1. Know the consumer behavior concepts by integrating and adapting theories developed in disciplines such as psychology, sociology, anthropology, and economics.
2. Use specific tools to tackle and analyze customer issues.
3. Develop the ability to apply consumer behavior concepts from the perspective of marketing managers and public policy makers.
4. Increase the awareness of and enhance the ability to make ethical decisions in consumer-related issues.

MKTG 312. Personal Selling**3 Credits (3)**

Implementation of the promotion process through interpersonal communications between salesperson and prospects. Serving customers by sales representatives.

Learning Outcomes

1. Demonstrate how personal selling can strategically enhance interpersonal communication skills, career management, personal productivity.
2. Identify key issues and trends such as opportunities or threats, for evolving emerging sales approaches platforms.

MKTG 313. Retail Management**3 Credits (3)**

Investigates retail business operations and focuses on the strategic profit model, store location, layout, display, merchandising, operations, and personnel.

Learning Outcomes

1. Analyze the role of retailing in society and basic retailing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and retailing opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of retailing strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, packaging, pricing, product/service design, methods of delivery and the product life cycle
5. Relate the concepts of marketing and retailing research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action

MKTG 314. Advertising Strategy**3 Credits (3)**

Utilization of advertising as a business administration function; communication with consumers as a means of attaining marketing goals.

Learning Outcomes

1. Analyze advertising from a consumer perspective
2. Compare advertising strategy theories and concepts
3. Evaluate advertising critically and creatively

MKTG 317. International Marketing**3 Credits (3)**

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as IB 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues.
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

MKTG 324. Product/Service Development**3 Credits (3)**

Covers product innovation, development, commercialization and resource recovery, price determination and administration strategies, and complementing planning processes.

Learning Outcomes

1. Understand the product/service development process.
2. Identify market opportunities for new products.
3. Use structured methods to evaluate and test product concepts.
4. Apply tools learned in class to develop new products/services.
5. Plan the launch of a product and evaluate its impact on the market.
6. Efficiently work with and communicate ideas to team members.

MKTG 354. Sports Marketing**3 Credits (3)**

The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.

Learning Outcomes

1. Discuss the domain of sports marketing
2. Apply basic marketing tools (e.g., research, segmentation) to sports marketing contexts
3. Recognize, evaluate, and accommodate the perspectives of participants and spectators as sports consumers
4. Identify appropriate marketing mix options for sports products
5. Appraise recent sports marketing trends
6. Plan a career in sports marketing

MKTG 357. Internet and Social Media Marketing**3 Credits (3)**

Focuses on the consumer psychology and marketing strategies at work in advertising and selling brands via the Internet and social media networks.

Learning Outcomes

1. Apply the concepts of the marketing mix to the formulation/evaluation of marketing strategies relative to Social Media policies that combine business objectives with appropriate use of Social Media channels and content.
2. Compare and contrast the history of Social Media and recognize the various platforms of Social Media.
3. Select/defend segmentation and target market selection relative to a specific population product/service that engages target audiences with a marketing message.
4. Analyze business objectives and connect to appropriate Social Media tactics.
5. Evaluate Social Media marketing content to shape the way we connect to and build relationships with users, consumers and businesses.
6. Relate the concepts of marketing research to establish metrics for measuring Social Media marketing success.

MKTG 380. Level 2, PGA's PGM Education Program (Part 2)**3 Credits (3)**

Level 2 Part 2 of the PGA PGM Education Program. This class will focus on Facility Management 2 and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Define the business at the facility level in terms of vision, core values, facility characteristics and mission.
2. Utilize the four Interaction Strategies in a variety of routine and challenging customer situations.
3. Identify core business areas that support a customer-focused environment
4. Know the characteristics of a merchandising operation that align with a facility's business plan
5. Understand how to define, assess, and develop tournament business at a facility.

MKTG 381. Level 3, PGA's PGM Education Program (Part 1)**3 Credits (3)**

Level 3 Part 1 of the PGA's PGM Education Program. This class will focus on Teaching and Coaching 3, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management

Learning Outcomes

1. Explain how various types of feedback function to influence learning
2. Define the major variables that influence learning and explain how they operate with implications for practice, learning, and teaching
3. Provide effective instructional feedback after students' practice and performance
4. Explain how the form, precision, timing, frequency, and regulation of augmented feedback influence learning with implications for teaching and practice conditions
5. Explain how the key practice factors influence learning with implication for designing practice conditions
6. Establish relationships that promote greater student learning and enjoyment
7. Plan long-term developmental programs for beginning and intermediate players
8. Communicate effectively with students
9. Develop a communication style that increases instructional effectiveness 1
10. Effectively determine and design an appropriate practice routine to the benefit of the golfer 1
11. Effectively determine and assign the appropriate drill or drill with an aid to improve the swing shape of the golfer 1
12. Use relevant technology to promote student learning 1
13. Effectively demonstrate and apply the appropriate specialty shot information to the benefit of the golfer 1
14. Demonstrate basic knowledge of current swing methodologies of noted instructors 1
15. Physical development of junior golfers 1
16. Assess the physical capabilities of adult golfer, describe implications for performance, and provide potential physical adjustments 1
17. Describe how to use bench skills, tools, and technologies for measuring and altering club performance 1
18. Perform analyses and make appropriate alterations to change ball flight, players performance, and teacher effectiveness

MKTG 400. Marketing Internship/Field Experience**3 Credits (3)**

Internship of field experience in application of marketing principles. The student must accept an internship before being allowed to enroll in the course. Consent of instructor required. Restricted to MKTG majors.

MKTG 449. Promotion Management**3 Credits (3)**

Covers concepts and problems in the use of advertising, internet marketing, social media marketing, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.

Learning Outcomes

1. Analyze the role of advertising and promotion in society and basic marketing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and promotional opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of promotional strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, pricing, product/service design, and e-commerce
5. Relate the concepts of marketing and advertising research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action in the promotional environment

MKTG 451. Food and Agribusiness Market Assessment**3 Credits (3)**

This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: AEEC 451.

Prerequisite(s): AEEC 305 or MKTG 305 or consent of instructor.

Learning Outcomes

1. Identify, organize and conduct market research specific to the project
2. Develop an understanding of primary and secondary research collection and analysis
3. Exhibit enhanced relationship management, communication skills, and team building
4. Develop written communication with final deliverable for implementation into the business world

MKTG 453. Sales Management**3 Credits (3)**

The nature of the sales management function in industry. Focuses on intra and interdepartmental sales management activities.

Prerequisite: MKTG 312.

Learning Outcomes

1. Examined the linkage between personal selling, as a basket of activities, and the management of those marketing personnel who do selling (i.e., salespeople).
2. Examined the role of the sales force in the achievement of a firm's marketing objectives.
3. Undertaken numerous case-based analyses of typical sales management issues, including the hiring, firing, training, motivation, compensation, deployment, and evaluation of the firm's sales personnel.
4. Developed decision-making skills and analytic capabilities in the development and management of both sales programs and salespeople.

MKTG 461. Seminar in Entrepreneurship**3 Credits (3)**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MGMT 461.

Prerequisite(s): Senior standing or consent of instructor.

MKTG 462. Advanced Sales**3 Credits (3)**

Advanced instruction and skill development in interpersonal communication skills to broaden understanding of the professional sales role (especially in team selling situation), career management, personal productivity, negotiation, and coordination with other functional areas.

Prerequisite: MKTG 312.

Learning Outcomes

1. Students will learn "how" to sell (i.e., the behaviors and planning associated with selling today).
2. Analyze the concept of what/how is perhaps equally important but not nearly as obvious, how and why buyers "buy".
3. The course focus will be particularly on so-called "business-to-business" (B2B) sales jobs, as that is where many of the most interesting – and lucrative – sales positions reside.

MKTG 480. Level 3, PGA's PGM Education Program (Part 2)**3 Credits (3)**

Level 3 Part 2 of the PGA's PGM Education Program. This class will focus on Facility Management 3, the Business Simulation Seminars, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management Majors

Learning Outcomes

1. Assess the current state of the business by conducting a SWOT Analysis
2. Describe the golf industry job market and the knowledge and skills required to succeed
3. Identify areas where food services and golf operations should coordinate efforts
4. Determine golf car needs in order to acquire a fleet that supports the facility's mission, customers, and physical characteristics
5. Describe the organizational structure, key departments, reporting relationships, and job descriptions of a facility
6. Utilize industry-proven pricing strategies to meet business objectives
7. Describe the Performance System for supervising and delegating
8. Describe practices that improve the golf course and protect the environment

MKTG 481. PGA Golf Management Final Experience**1 Credit (1)**

The following are requirements for successful completion of this senior level PGA Golf Management capstone course: 16 months of internship, completion of the Qualifying Level, Level 1, Level 2, and Level 3 of the PGA's PGM Education Program and successful completion of the PGA's Playing Ability Test. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Describe the golf industry job market and the knowledge and skills required to succeed
2. Access PGA employment resources and participate in professional growth and development

MKTG 489. Strategy and Policy**3 Credits (3)**

Techniques and analysis of marketing strategy and policy planning and formulation. Senior standing or consent of instructor.

Prerequisite(s): MKTG 310.

Learning Outcomes

1. Relate marketing strategy to the environmental constraints and opportunities with which managers must deal
2. Compare marketing strategy theories and concepts
3. Evaluate appropriate strategic marketing decisions in various situations

MKTG 490. Selected Topics**1-18 Credits (1-18)**

Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.

MKTG 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

MKTG 503. Marketing Management**3 Credits (3)**

Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions.

Learning Outcomes

1. Identify the fundamental principles and theories of marketing
2. Outline primary and changing perspectives on marketing and strategic management
3. Apply relevant marketing concepts and analytical tools
4. Develop capacity to obtain and process relevant information with enhanced analytical skills
5. Identify viable alternative to make informed choices and recommend marketing implementation plans
6. Evaluate the impact of interactive media on marketing management
7. Develop skills in organizing more effective strategic marketing and implementing the market planning process
8. Practice implementing marketing management strategies in complex environments through case study analyses
9. Formulate marketing management strategies on critical issues, problems, and business opportunities 1
10. Synthesize perspectives of ethics and social responsibility in adapting to changing environments

MKTG 591. Seminar in Entrepreneurship**3 Credits (3)**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGMT 591.

Prerequisite(s): Graduate standing.

MKTG 601. Marketing Management**3 Credits (3)**

Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.

Learning Outcomes

1. Identify the contemporary principles and theories of marketing strategy research
2. Outline primary guidelines and trendy directions of marketing strategic research
3. Improve theoretical foundation for research development in marketing strategy
4. Develop capacity of analytical and quantitative skills required for empirics
5. Apply relevant marketing theories, concepts and analytical methodology in research development
6. Formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena
7. Practice complex research design, theoretical development and empirical operationalization
8. Synthesize perspectives of ethics and social responsibility in scholarly research

MKTG 620. Contemporary Marketing Readings**3 Credits (3)**

Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to apply theory that they have learned to the process of doing research.

MKTG 625. Consumer Behavior**3 Credits (3)**

Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary issues relevant to the study of marketing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to develop theories and frameworks.
2. Students will be able to discuss the latest research topics related to consumer behavior.
3. Students will be able to generate research ideas (interesting questions about consumer behavior and research hypotheses).
4. Students will be able to design experiments to test their research ideas and hypotheses.

MKTG 640. Measurement and Structural Equation Modeling**3 Credits (3)**

Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. May be repeated up to 3 credits.

Prerequisite(s): A ST 505.

MKTG 670. Marketing Theory**3 Credits (3)**

The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to identify the contemporary principles and theories of marketing strategy research.
2. Students will be able to outline primary guidelines and trendy directions of marketing strategic research.
3. Students will be able to improve theoretical foundation for research development in marketing strategy.
4. Students will be able to develop capacity of analytical and quantitative skills required for empirics.
5. Students will be able to apply relevant marketing theories, concepts and analytical methodology in research development.
6. Students will be able to formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena.
7. Students will be able to implement complex research design, theoretical development, and empirical operationalization.
8. Students will be able to synthesize perspectives of ethics and social responsibility in scholarly research.

MKTG 690. Special Topics in Marketing**3 Credits (3)**

A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.

MKTG 698. Selected Topics**1-9 Credits (1-9)**

Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.

MKTG 700. Doctoral Dissertation**1-15 Credits (1-15)**

May be repeated up to 88 credits.

Prerequisite: advancement to candidacy.

Name: Department Head - David Daniel

Office Location: BC Suite 212

Phone: (575) 646-3341

Website: /nmsu/business/marketing/ (p. 902)

PGA Golf Management Program

Name: *Director* Pat Gavin; *Program Specialist* Josh Salmon; *Program Coordinator* Henry Stetina

Office Location: BC Suite 212

Phone: (575) 646-2814

Website: /nmsu/business/marketing/marketing-pga-golf-management-bachelor-business-administration/ (p. 911)

Marketing (Advertising) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: A more general marketing major is offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs/> (<https://business.nmsu.edu/degree-programs/undergraduate-programs/>)

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
Grades of C- or better are required in general education communications courses.		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{2,3}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-)	3
Viewing A Wider World ⁴		6
Departmental/College Requirements		
<i>Foundation Requirements</i>		
Choose one from the following: ³		3
(If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement)		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grade of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3

MKTG 303	Principles of Marketing	3
One of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses		
<i>Major Core Classes</i>		
MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
<i>Concentration Courses</i>		
MKTG 311V	Consumer Behavior	3
MKTG 314	Advertising Strategy	3
MKTG 357	Internet and Social Media Marketing	3
MKTG 449	Promotion Management	3
<i>Major electives</i>		
Choose two from the following:		6
MKTG 313	Retail Management	
MKTG 317	International Marketing	
MKTG 324	Product/Service Development	
MKTG 354	Sports Marketing	
Electives, to bring the total credits to 120 ⁵		16
Total Credits		120

¹ See the General Education (p. 220) of the catalog for a full list of courses.

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and either MATH 1350G Introduction to Statistics or A ST 311 Statistical Applications must be completed.

⁴ See the Viewing a Wider World (p. 224) of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited.⁴

First Year

Semester 1		Credits
ENGL 1110G	Composition I (C- or better) ¹	4
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Area V: Humanities Course ²		3
Elective Course		3
Credits		16

Semester 2		
COMM 1115G	Introduction to Communication (C- or better)	3
BUSA 1110	Intro to Business (C- or better)	3
MATH 1430G	Applications of Calculus I ¹	3
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Semester 1		
ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
MATH 1350G	Introduction to Statistics (C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Elective Course		3
Credits		15

Semester 2		
ECON 2120G	Principles of Microeconomics (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better) ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) ³		3
Credits		15

Third Year

Semester 1		
MKTG 311V	Consumer Behavior	3
MKTG Upper-Division Elective		3
BCIS 338	Business Information Systems I ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
Credits		15

Semester 2		
MKTG 310	Marketing Research (usually delivered face to face in Fall and Spring; delivered online in Spring only) ¹	3
MKTG 314	Advertising Strategy	3
Choose from one of the following: ¹		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning ¹	
VWW: Viewing a Wider World Course (excluding MKTG 311V) ³		3
Elective Course		3
Credits		15

Fourth Year

Semester 1		
MKTG 357	Internet and Social Media Marketing	3
MKTG 449	Promotion Management	3
ECON Upper-Division Elective		3

Any Upper-Division Business Elective Course (excluding A ST 311)	3
Elective Course	3

Semester 2		Credits
MKTG 489	Strategy and Policy (usually delivered face to face in Fall and Spring; delivered online in Summer only) ¹	3
MKTG Upper-Division Elective		3
MGMT 449	Strategic Management ¹	3
Elective Course(s)		4
Credits		13
Total Credits		120

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Most, but not all, upper-division MKTG courses are offered online. However, most MKTG courses that are offered online are only offered once per year. Most online courses that are available for *on-campus majors* to take (i.e., not through the *NMSU-O campus*) have substantially limited enrollment – please plan accordingly.

⁵ While this course can *currently* be substituted for by other upper-division MKTG courses, it is likely to be required in future catalogs and taking it is strongly encouraged.

Marketing (PGA Golf Management) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120.5 credits with 58.5 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: Students must apply separately to the PGA Golf Management Program for acceptance. Acceptance is limited to the fall of every year.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
Grades of C- or better are required in general education communications courses.		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{2,3}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Area III: Laboratory Sciences Course (4 credits) ¹		
<i>Area V: Humanities</i> ¹		3

Area VI: Creative and Fine Arts ¹		3
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) ³	3
Viewing A Wider World ⁴		6
Departmental/College Requirements		
Foundation Requirements		
Choose one from the following: ³		3
(If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement.)		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
Business Core: Lower Division (minimum grade of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
One of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses		
MKTG 180	Level 1, PGA's PGM Education Program (Part 1)	3
MKTG 181	Level 1, PGA's PGM Education Program (Part 2)	3
MKTG 280	Level 1, PGA's PGM Education Program (Part 3)	3
MKTG 281	Level 2, PGA's PGM Education Program (Part 1)	3
MKTG 310	Marketing Research	3
MKTG 313	Retail Management	3
MKTG 380	Level 2, PGA's PGM Education Program (Part 2)	3
MKTG 381	Level 3, PGA's PGM Education Program (Part 1)	3
MKTG 480	Level 3, PGA's PGM Education Program (Part 2)	3
MKTG 481	PGA Golf Management Final Experience	1
MKTG 489	Strategy and Policy	3
Elective in Marketing, upper division		6
Electives, to bring the total credits to 120 ⁵		3
Total Credits		120

¹ See the General Education (p. 220) of the catalog for a full list of courses.

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G

College Algebra, MATH 1430G Applications of Calculus I, and either MATH 1350G Introduction to Statistics or A ST 311 Statistical Applications must be completed.

⁴ See the Viewing a World (p. 224) of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120.5 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited. ⁴

First Year

Fall		Credits
MATH 1215	Intermediate Algebra	3
BCIS 1110	Introduction to Information Systems	3
ENGL 1110G	Composition I ¹	4
Area V: Humanities ¹		3
MKTG 180	Level 1, PGA's PGM Education Program (Part 1) (Q-Level/Facility MGT 1A) Complete PGA's Qualifying Level, Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), W.E. Activities If you haven't passed PAT => Attempt Playing Ability Test (PAT)	3
Credits		16

Spring		
MATH 1220G	College Algebra ^{2,3}	3
BUSA 1110	Intro to Business	3
Area III: Laboratory Science Course ¹		4
COMM 1115G	Introduction to Communication ¹	3
MKTG 181	Level 1, PGA's PGM Education Program (Part 2) (Teaching and Coaching 1) (Teaching Seminar 2 Days) Complete Teaching and Coaching 1, W.E. Activities, Teaching and Coaching Seminars. If you haven't passed PAT => Attempt Playing Ability Test (PAT)	3
Credits		16

Summer

Summer Internship 1 (3 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
Credits		0

Second Year

Fall		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grad of at least C-) ³	3
ECON 2110G	Macroeconomic Principles (Satisfies 1st Social/Behavioral Science)	3
ACCT 2110	Principles of Accounting I	3
ENGL 2210G	Professional & Technical Communication	3
MKTG 280	Level 1, PGA's PGM Education Program (Part 3)	3

(Facility MGT 1B) Complete Facility Management 1 B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), W.E. Activities, Level 1 Exams. If you haven't passed PAT => Attempt Playing Ability Test (PAT)

Credits		15
Spring		
ECON 2120G	Principles of Microeconomics	3
Statistics Requirement ³		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
Area VI: Creative and Fine Arts Course ¹		3
ACCT 2120	Principles of Accounting II	3
MKTG 281	Level 2, PGA's PGM Education Program (Part 1)	3
(Teaching and Coaching 2) (Teaching Seminar 3 Days) Complete Teaching and Coaching 2, W.E. Activities, Teaching and Coaching Seminars. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		15
Summer		
Summer Internship 2 (3 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		0
Third Year		
Fall		
MKTG 313	Retail Management	3
BCIS 338	Business Information Systems I	3
MKTG 303	Principles of Marketing	3
MKTG 310	Marketing Research	3
MKTG 380	Level 2, PGA's PGM Education Program (Part 2)	3
(Facility MGT 2) Complete Facility MGT 2 & Business Planning B, Customer Relations B, golf Ops A, Merchandising B, Tournament Ops B), W.E. Activities. Level 2 Exams. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		15
Spring		
MKTG Upper Level Elective		3
MGMT 309	Human Behavior in Organizations	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MKTG 381	Level 3, PGA's PGM Education Program (Part 1)	3
(Teaching and Coaching 3) (Teaching Seminar 2 Days) Complete Teaching and Coaching 3, W.E. Activities, Teaching and Coaching Seminars. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		15
Summer		
Summer Internship 3 (3 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		0
Fourth Year		
Fall		
MKTG Upper Level Elective		3
MGMT 344	Production and Operations Management	3
ECON Upper level Elective		3
Viewing the Wider World (VWW) ⁴		3
MKTG 480	Level 3, PGA's PGM Education Program (Part 2)	3

(Facility MGT 3) (Business Simulations 1 Day) Complete Facility MGT 3 (Business Planning C, Golf Ops B, Merchandising C, Golf Car Fleet B, Supervising and Delegating A, Turfgrass B, Food and Bev A, Career Enhancement C), W.E. Activities, Level 3 Exams, Business Simulations. If you haven't passed PAT => Attempt Playing Ability Test (PAT)

Credits		15
Spring		
MGMT 449	Strategic Management	3
MKTG 489	Strategy and Policy	3
Upper Level Elective in any Business Class		3
Viewing the Wider World (VWW) ⁴		3
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		12
Summer		
Summer Internship 4 (7 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		0
Fifth Year		
Fall		
MKTG 481	PGA Golf Management Final Experience	1
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		

Credits		1
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and either MATH 1350G Introduction to Statistics or A ST 311 Statistical Applications must be completed.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Marketing (Professional Selling) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: A more general marketing major is offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs/> (<https://business.nmsu.edu/degree-programs/undergraduate-programs/>)

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
Grades of C- or better are required in general education communications courses.		

<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{2,3}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) ³	3
Viewing A Wider World ⁴		6
Departmental/College Requirements		
<i>Foundation Requirements</i>		
Choose one from the following: ³		3
(If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement)		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grade of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
One of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses		
<i>Major Core Classes</i>		
MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
<i>Concentration Courses</i>		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
MKTG 453	Sales Management	3
MKTG 462	Advanced Sales	3
<i>Major electives</i>		6
Choose two from the following:		
MKTG 313	Retail Management	

MKTG 317	International Marketing	
MKTG 324	Product/Service Development	
MKTG 354	Sports Marketing	
Electives, to bring the total credits to 120 ⁵		16
Total Credits		120

¹ See the General Education (p. 220) of the catalog for a full list of courses.

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and either MATH 1350G Introduction to Statistics or A ST 311 Statistical Applications must be completed.

⁴ See the Viewing a Wider World (p. 224) of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

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First Year

Semester 1		Credits
ENGL 1110G	Composition I (C- or better) ¹	4
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Area V: Humanities Course ²		3
Elective Course		3
Credits		16

Semester 2		Credits
COMM 1115G	Introduction to Communication (C- or better)	3
BUSA 1110	Intro to Business (C- or better)	3
MATH 1430G	Applications of Calculus I ¹	3
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Semester 1		Credits
ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
MATH 1350G	Introduction to Statistics (C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3

Elective Course		3
Credits		15
Semester 2		
ECON 2120G	Principles of Microeconomics (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better) ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) ³		3
Credits		15
Third Year		
Semester 1		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
BCIS 338	Business Information Systems I ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
Credits		15
Semester 2		
MKTG 310	Marketing Research (usually delivered face to face in Fall and Spring; delivered online in Spring only) ¹	3
MKTG Upper-Division Elective		3
Choose from one of the following: ¹		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning ¹	
VWW: Viewing a Wider World Course (excluding MKTG 311V) ³		3
Elective Course		3
Credits		15
Fourth Year		
Semester 1		
MKTG 453	Sales Management	3
MKTG Upper-Division Elective		3
ECON Upper-Division Elective		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Elective Course		3
Credits		15
Semester 2		
MKTG 489	Strategy and Policy (usually delivered face to face in Fall and Spring; delivered online in Summer only) ¹	3
MKTG 462	Advanced Sales	3
MGMT 449	Strategic Management ¹	3
Elective Course(s)		4
Credits		13
Total Credits		120

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Most, but not all, upper-division MKTG courses are offered online. However, most MKTG courses that are offered online are only offered once per year. Most online courses that are available for *on-campus*

majors to take (i.e., not through the *NMSU-O campus*) have substantially limited enrollment – please plan accordingly.

⁵ While this course can *currently* be substituted for by other upper-division MKTG courses, it is likely to be required in future catalogs and taking it is strongly encouraged.

Marketing (Strategic Marketing) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: A more general marketing major is offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website: <http://business.nmsu.edu/academics/undergraduate/online-programs/> (<https://business.nmsu.edu/degree-programs/undergraduate-programs/>)

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
Grades of C- or better are required in general education communications courses.		
<i>English Composition - Level 1</i> ¹		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{2,3}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) ³	3
Viewing A Wider World ⁴		6
Departmental/College Requirements		
<i>Foundation Requirements</i>		
Choose one from the following: ³		3
(If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement)		
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
<i>Business Core: Lower Division (minimum grade of C- required)</i>		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
<i>Business Core: Upper Division</i>		

BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
One of the following:		3
BCIS 485	Enterprise Resource Planning	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses		
<i>Major Core Classes</i>		
MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
<i>Concentration Courses</i>		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
MKTG 313	Retail Management	3
MKTG 314	Advertising Strategy	3
<i>Major electives</i>		6
Choose two from the following:		
MKTG 317	International Marketing	
MKTG 324	Product/Service Development	
MKTG 354	Sports Marketing	
Electives, to bring the total credits to 120⁵		16
Total Credits		120

¹ See the General Education (p. 220) of the catalog for a full list of courses.

² MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

³ All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and either MATH 1350G Introduction to Statistics or A ST 311 Statistical Applications must be completed.

⁴ See the Viewing a Wider World (p. 224) of the catalog for a full list of courses.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

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from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited.⁴

First Year

Semester 1		Credits
ENGL 1110G	Composition I (C- or better) ¹	4
MATH 1220G	College Algebra (C- or better) ¹	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Area V: Humanities Course ²		3
Elective Course		3
Credits		16

Semester 2

COMM 1115G	Introduction to Communication (C- or better)	3
BUSA 1110	Intro to Business (C- or better)	3
MATH 1430G	Applications of Calculus I ¹	3
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Second Year

Semester 1

ENGL 2210G	Professional & Technical Communication (C- or better) ¹	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
MATH 1350G	Introduction to Statistics (C- or better) ¹	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Elective Course		3
Credits		15

Semester 2

ECON 2120G	Principles of Microeconomics (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better) ¹	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) ³		3
Credits		15

Third Year

Semester 1

MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
BCIS 338	Business Information Systems I ¹	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets ¹	3
Credits		15

Semester 2

MKTG 310	Marketing Research (usually delivered face to face in Fall and Spring; delivered online in Spring only) ¹	3
MKTG 314	Advertising Strategy	3
Choose from one of the following: ¹		3
MGMT 344	Production and Operations Management ¹	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning ¹	
VWW: Viewing a Wider World Course (excluding MKTG 311V) ³		3
Elective Course		3
Credits		15

Fourth Year**Semester 1**

MKTG 313	Retail Management	3
MKTG Upper-Division Elective		3
ECON Upper-Division Elective		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Elective Course		3

Credits **15**

Semester 2

MKTG 489	Strategy and Policy (usually delivered face to face in Fall and Spring; delivered online in Summer only) ¹	3
MKTG Upper-Division Elective		3
MGMT 449	Strategic Management ¹	3
Elective Course(s)		4

Credits **13**

Total Credits **120**

¹ These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Most, but not all, upper-division MKTG courses are offered online. However, most MKTG courses that are offered online are only offered once per year. Most online courses that are available for *on-campus majors* to take (i.e., not through the *NMSU-O campus*) have substantially limited enrollment – please plan accordingly.

⁵ While this course can *currently* be substituted for by other upper-division MKTG courses, it is likely to be required in future catalogs and taking it is strongly encouraged.

Advertising - Undergraduate Minor

If you are considering the Minor in Advertising, please visit the Department of Marketing, Business Complex, room 209 to arrange a consultation with a Marketing Faculty member for guidance and a suggested Plan of Study for the minor, etc. Students must have a cumulative grade point average of 2.0 in the 18 credits in order to earn the Minor in Advertising. Also, at least twelve credits for the minor must be completed at NMSU.

This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

Prefix	Title	Credits
Requirements		
MKTG 303	Principles of Marketing	3
MKTG 311V	Consumer Behavior	3
MKTG 314	Advertising Strategy	3
MKTG 449	Promotion Management	3
Additional credits from any College of Business prefix (including MKTG) ¹		6
Total Credits		18

¹ All courses must be upper-division (300 level or above).

Marketing - Undergraduate Minor

If you are considering the Minor in Marketing, please visit the Department of Marketing to arrange a consultation with a Marketing faculty member for guidance, a suggested Plan of Study, or possible course substitutions. Students must have a cumulative grade point average of 2.0 for the 18 credits taken in the minor. At least 12 credits for the minor must be completed at NMSU.

This minor is not available to majors in Individualized Studies or Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

Prefix	Title	Credits
Requirements		
MKTG courses ¹		12
Additional credits from any College of Business prefix (including MKTG)		6
Total Credits		18

¹ HRTM 301 Hotel, Restaurant, and Tourism Marketing may be substituted.

1. All courses must be upper-division (300 level or above).

Professional Selling - Undergraduate Minor

If you are considering the Minor in Professional Selling, please visit the Department of Marketing to arrange a consultation with a Marketing faculty member for guidance, a suggested Plan of Study, or possible course substitutions. Students must have a cumulative grade point average of 2.0 for the 18 credits in taken in the minor. At least 12 credits for the minor must be completed at NMSU.

This minor is not available to majors in Individualized Studies or Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

Prefix	Title	Credits
Required Courses		
MKTG 303	Principles of Marketing	3
MKTG 312	Personal Selling	3
MKTG 462	Advanced Sales	3
<i>Must complete 9 credits from the following:</i>		9
MKTG 453	Sales Management	
MKTG 461	Seminar in Entrepreneurship	
MKTG 400	Marketing Internship/Field Experience	
MGMT 310V	Entrepreneurial Mindset	
BCIS 461	Business Analytics I	
HRTM 432	Hotel Revenue and Sales Management	
Total Credits		18

College of Engineering

Dean - Lakshmi Reddi, Ph.D., P.E.

Associate Dean (Academic Programs) - David Jauregui, Ph.D., P.E.

Associate Dean (Research) - Satyajayant Misra, Ph.D.

Associate Dean (Outreach and Recruitment) - Patricia Sullivan, Ph.D.

Assistant Dean (Student Success and Experiential Learning) - Gabe Garcia, Ph.D.

College Chief of Staff - Linda Fresques

The College of Engineering comprises six departments:

- Chemical Engineering (p. 923);
- Civil Engineering (p. 937);
- Electrical and Computer Engineering (p. 950);
- Engineering Technology and Surveying Engineering (p. 1001);
- Industrial Engineering (p. 1054);
- Mechanical and Aerospace Engineering (p. 1062).

Mission of the College of Engineering

The College of Engineering will uphold the land grant mission of NMSU through nationally recognized programs in education, research and professional and public service.

With respect to our undergraduate programs, we will accomplish our mission by focusing on the following goals:

1. To be nationally and internationally recognized for academic and research programs in engineering and engineering technology.
2. Provide world-class engineers and engineering technologists for industrial, government, and academic constituents of the College of Engineering.
3. To be the University of Choice for undergraduate engineering and engineering technology education in the region.
4. To serve as an engine for economic development in New Mexico through the advancement of engineering and technology.

Furthermore, graduates receiving baccalaureate degrees will demonstrate:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Undergraduate Student Advisement

Starting with the fall 2017 semester, students entering the College of Engineering will be advised by the Center for Academic Advising and Student Support (CAASS) located in Educational Services, Suite 200. Students may also change majors at the CAASS. Students uncertain about choosing a major may list themselves as undeclared in the College of Engineering and be advised by the CAASS. Undeclared students will be asked to choose a major after two semesters in the college. Students are encouraged to consult with departmental mentors on subjects related to course offerings, student organizations, internships, research opportunities, graduate education, and career options. Students must have a declared major in order to graduate.

Undergraduate General Education

With the exception of math and science, the college accepts all coursework approved for inclusion in the New Mexico General Education Common Core. Calculus I, General Chemistry I and Engineering Physics I are required to satisfy areas II and III of the common core.

S/U Coursework

The college requires most degree requirements to be taken with traditional grading. Students may take selected humanities and social science courses under the S/U option. Other exceptions are specifically noted in the program descriptions later in this catalog.

Undergraduate Math Placement

Entering freshmen are placed into an appropriate math course based upon the results of the Math Placement Exam administered regularly by the NMSU mathematics department. Students with advanced placement or transfer credit for mathematics will be placed accordingly.

Minors

Minors are available from most departments within the College of Engineering, and they are outlined in the individual program descriptions.

Undergraduate Cooperative Education

After two semesters of satisfactory academic work (2.5 GPA or higher), an engineering student may go on a work phase with one of the many companies or governmental agencies with which the university has co-op agreements. The experience obtained through alternating periods of academic and field work greatly contributes to the preparation of a student for professional life. Work phases are considered to be a vital part of the educational process, and students are counseled in the selection of co-op positions that will lead to progressive learning experiences. Earnings while on work phase provide a source of financial assistance to meet educational expenses.

A significant number of undergraduate engineering students are in the cooperative education program. Students may, with the approval of their Department Head, earn credit while participating in a co-op work phase. Co-op credits do not normally count toward the degree requirements, but are displayed on the transcript.

Undergraduate General Academic Requirements

For regular admission to the university and the College of Engineering, incoming freshman and transfer applicants must meet the university's qualifications for regular admission as stated in the undergraduate catalog in effect at the time of application. Students admitted to the College of Engineering will be classified by the college as a PRE-[major] until the standard requirements described below for admission to the program major are met.

PRE-[major] students will be admitted into their respective programs once they have earned a minimum grade of C- in all of the following courses:

Prefix	Title	Credits
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1120G (engineering technology)		
ENGL 1110G/1110H/1110M	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1430G (engineering technology)		
PHYS 1310G	Calculus -Based Physics I	3
or PHYS 1230G (engineering technology)		

Any of the above courses with earned AP credit (minimum score of 3) is exempt from the list. Transfer students may meet this criteria with determined passing credit of equivalent courses. PRE-[major] students will be advised by their EG-[major] department.

NMSU College of Engineering reserves the right to independently test any student's English proficiency upon arrival, including those who have earned scores satisfying minimum admission criteria. If the demonstrated level of English proficiency is not sufficient for academic success as determined by university regulations, support classes may be required to improve proficiency.

Students must earn a minimum cumulative GPA of 2.0 before enrolling in engineering courses numbered 300 or above. Students seeking to continue in engineering upper division courses with a GPA below 2.0 need to meet with the Associate Dean of Academics to create a course plan designed to increase their GPA and meet this criteria.

Students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree and also courses taken to satisfy the general education requirements for Area I-Communications, Area II-Mathematics, and Area III-Laboratory Sciences. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. An undergraduate student may attempt an engineering, math, or physical science course no more than three times to earn a grade of C- or better. Anytime a student earns a grade less than a C-, a meeting with the appropriate engineering academic advisor is required to develop a plan for addressing this issue. Ultimately, if the student fails to earn a minimum grade of C- after three attempts in any of these courses, then the student will not be able to continue as an engineering major and will be counseled on other degree options.

Digital Badges

Learning a knowledge-based skill by spending a concentrated, short period of time can lead to the awarding of a competency in the form of a digital badge. Digital badges can be combined or a longer skill-

based instructional path can be used to secure a micro-credential which may lead to college credit. Skills leading to digital badges and micro-credentials can be acquired in various ways including workshops, online classes, and focused courses through NMSU OnDemand or outside of NMSU.

The College of Engineering encourages students to engage in experiential and focused learning that leads to knowledge-based skills relevant in industry including specific software, project management, leadership, quality, entrepreneurship, and critical thinking. Digital badge and micro-credential earners can also benefit by having the ability to combine classroom knowledge with acquired skills, especially in design classes.

Other benefits of digital badges include: being able to choose what knowledge-based skills you want to develop; strategically combining several badges to form an overarching micro-credential; and sharing your achievements online with others including prospective employers.

Badges and micro-credentials recognized by the College of Engineering are those that are validated by assessment, supported by evidence, and relevant to the practice of engineering.

Students in the College of Engineering have been earning digital badges and micro-credentials independently or through sponsored projects. Starting with this catalog, the College of Engineering degree programs are providing recommendations to students on what skills can enhance their learning and when in the curricular path would digital badges and overarching micro-credential be most beneficial. Specific information on digital badges and micro-credentials can be found on the degree program pages of the catalog.

Engineering Transfer Policy

NMSU Administrative Rules and Procedures, Section 4.61, Transfer Credit states the following: PART 3A, Student. "It is the student's responsibility to provide the necessary materials for consideration by Departmental Faculty of their requests for transfer credit" and PART 3B, Departmental Faculty. "Departmental Faculty review and decide requests for transfer credit". Policy for engineering majors enrolling in courses at other institutions to meet College of Engineering Departmental Core Requirements¹ includes:

1. NMSU main campus engineering majors may take core classes at other institutions of higher education to meet NMSU College of Engineering Departmental Core in the following situations: (1) if the NMSU core course cannot accommodate any more eligible students and (2) the course is not offered during a given semester of the academic year.
2. The following conditions and restrictions apply to any course not taken on the NMSU main campus.
 - The department must approve the course prior to enrollment (student shall provide a corresponding course syllabus and any other documentation required to Department Head).
 - The course must be a class in a program that is accredited by an accreditation commission of ABET, Inc. and cannot be graded in the S/U grade mode.
 - The course must be substantially the same as the equivalent NMSU class and the student must have satisfied all NMSU prerequisite requirements.
 - The student shall provide a corresponding course syllabus and any other documentation required.

- If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.

In addition to 2 above, the following conditions apply to any on-line course not taken from the NMSU main campus.

- Scheduled exams, if any, shall be proctored².
- If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.

¹ Core requirements are defined as required departmental, discipline-related courses within the major.

² The student may choose to have NMSU proctored exams (<https://inside.nmsu.edu/digitallearning/proctoru/>)

For more information about transferring to New Mexico State University from another accredited institution, visit the NMSU Transfer Center.

Requirements for Graduation

The minimum requirements for undergraduate degrees are:

1. Satisfaction of the university requirements as previously outlined in the Regulations (p. 31) section of this catalog.
2. Satisfaction of the college requirements as outlined under General Academic Requirements, above.
3. Satisfaction of the departmental rules and course requirements as outlined in the individual program descriptions.

NOTE: In order to maintain quality, remain current, and satisfy changes in accreditation criteria, requirements which have been published may be changed. Any such changes will be announced and will not be retroactive. Always consult an academic advisor from your department before registering for classes.

Master's Accelerated Program

Students who have a minimum GPA of 3.0 are eligible for the Masters Accelerated Program (MAP) in engineering. The MAP allows a student to earn both a bachelor's and master's degree in as little as five years.

A master's degree is increasingly becoming the professional degree of choice for engineering practice. Many employers encourage, or even require, their employees to seek the degree during their early career, and master's holders often experience increased upward mobility and earn substantially greater salaries as a result.

General requirements:

- It takes 30 to 32 credit hours to complete a master's degree.
- Up to 12 credits of your undergraduate coursework 450 and above may be counted toward the master's degree.
- It's possible to complete the master's degree in 2-3 semesters after graduation with a bachelor's degree.

Visit the Master's Accelerated Program (MAP) (<https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html>) page for more information.

Graduate Degrees

Graduate study is available in

- Aerospace Engineering (p. 1063),
- Chemical Engineering (p. 924),
- Civil Engineering (p. 939),
- Electrical Engineering (p. 952),
- Environmental Engineering (p. 939),
- Industrial Engineering (p. 1055),
- Information Technology (<https://catalogs.nmsu.edu/nmsu/engineering/engineering-technology-surveying/#degreestext>), and
- Mechanical Engineering (p. 1063).

A multi-disciplinary graduate degree with concentration in Advanced Manufacturing (p. 921) is also available. See individual program descriptions for graduate degree requirements.

Bachelor Degrees

A

- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 1071)

C

- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 934)
- Civil Engineering - Bachelor of Science in Civil Engineering (p. 946)

E

- Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering (p. 969)
- Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering (p. 971)
- Electrical Engineering (Control & Power) - Bachelor of Science in Electrical Engineering (p. 973)
- Electrical Engineering (Controls & Robotics) - Bachelor of Science in Electrical Engineering (p. 975)
- Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering (p. 977)
- Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering (p. 979)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 966)
- Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics (p. 994)
- Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics (p. 995)
- Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics (p. 997)
- Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics (p. 999)
- Engineering Technology - Civil (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology (p. 1027)
- Engineering Technology - Civil (Transportation Technology) - Bachelor of Science in Engineering Technology (p. 1029)

- Engineering Technology - Civil - Bachelor of Science in Engineering Technology (p. 1025)
- Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology (p. 1031)
- Engineering Technology - Information - Bachelor of Science in Engineering Technology (p. 1033)
- Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology (p. 1035)

G

- Geomatics - Bachelor of Science in Geomatics (p. 1037)
- Geomatics - Bachelor of Science in Geomatics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/geomatics-bs-geomatics-online/>)

I

- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 1059)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (p. 1043)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-cyber-defense-bict-online/>)
- Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-network-technologies-bict-online/>)
- Information and Communication Technology (Network Technologies) - Bachelor of Information Communication Technology (p. 1046)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (p. 1049)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-software-development-bict-online/>)
- Information and Communication Technology - Bachelor of Information and Communication Technology (p. 1039)
- Information and Communication Technology - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-bict-online/>)

M

- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 1073)

Masters Degrees

The College of Engineering offers three types of Master's curriculum: thesis, project or coursework-only. Students interested in research and a career in R&D may prefer the M.S. thesis option, while students who select the M.E. or M-IT degrees may be more interested in acquiring knowledge and applying it in their professional workplace.

- The Master of Science (M.S.) degree is completed either with a thesis or a project.

- The Master of Engineering (M.E.) degree is completed without the preparation of a formal research thesis or project and is based only on coursework.
- The Master of Information Technology (M-IT) degree is completed without the preparation of a formal research thesis or project and is based only on coursework.

A

- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 90)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/aerospace-engineering-meae-online/>)
- Aerospace Engineering - Master of Science (p. 90)

C

- Chemical Engineering - Master of Science in Chemical Engineering (p. 116)
- Chemical Process Industry - Master of Engineering in Chemical Process Industry (p. 116)
- Chemical Process Industry - Master of Engineering in Chemical Process Industry (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/chemical-process-industry-mecpi-online/>)
- Civil Engineering - Master of Engineering in Civil Engineering (p. 118)
- Civil Engineering - Master of Engineering in Civil Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/civil-engineering-mece-online/>)
- Civil Engineering - Master of Science in Civil Engineering (p. 119)

E

- Electrical Engineering - Master of Engineering in Electrical Engineering (p. 137)
- Electrical Engineering - Master of Engineering in Electrical Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/electrical-engineering-meee-online/>)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 139)
- Electrical Engineering - Master of Science in Electrical Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/electrical-engineering-msee-online/>)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 143)

I

- Industrial Engineering - Master of Engineering in Industrial Engineering (p. 151)
- Industrial Engineering - Master of Engineering in Industrial Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/industrial-engineering-meie-online/>)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 152)
- Industrial Engineering - Master of Science in Industrial Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/industrial-engineering-msie-online/>)

- Information Technology - Master of Information Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/information-technology-mit-online/>)

M

- Mechanical Engineering - Master of Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/mechanical-engineering-meme-online/>)
- Mechanical Engineering - Master of Engineering in Mechanical Engineering (p. 155)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 156)

Advanced Manufacturing - Concentration

The graduate concentration in advanced manufacturing educates students and creates a skilled workforce for the growing needs of new technologies and advanced products in the 21st century. The program provides hands-on experience on designing, adapting, and building parts using advanced materials by including new processes, changing the supply chain, and adapting business models. It also includes the design optimization, materials selection and characterization, process parameter mapping, data analytics, software development, and final part inspection among other concepts. This concentration is maintained by the College of Engineering but is open to any Master's level major/degree.

Prefix	Title	Credits
Required Courses		
IE 575	Advanced Manufacturing Processes	3
IE 571	Advanced Quality Control	3
CE 510	Introduction to Nondestructive Testing	3
CHME 564	Polymer Science & Engineering	3
CHME 491/AGRO 450	Undergraduate Special Topics (AGRO 450 CHME 491 Development of Agricultural Technologies)	3
Electives		
5 Electives (Select 500 Level Courses from EE, CHME, IE, CE, or MAE) ¹		15
Total Credits		30

¹ With Approval of the advisor and instructor

Selection of Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

Although there is no oral exam, students will be required to complete an exit-interview with one of Advanced Manufacturing concentration and one graduate faculty member from the master of engineering they select to study.

Doctoral Degree

A

- Aerospace Engineering - Doctor of Philosophy (p. 173)

E

- Engineering (Chemical Engineering) - Doctor of Philosophy (p. 187)
- Engineering (Civil Engineering) - Doctor of Philosophy (p. 188)
- Engineering (Electrical Engineering) - Doctor of Philosophy (p. 188)
- Engineering (Industrial Engineering) - Doctor of Philosophy (p. 190)
- Engineering (Mechanical Engineering) - Doctor of Philosophy (p. 191)

Graduate Certificates

- Digital Communications - Graduate Certificate (p. 206)
- Digital Signal Processing - Graduate Certificate (p. 206)
- Electric Energy Systems - Graduate Certificate (p. 206)
- Systems Engineering - Graduate Certificate (p. 211)
- Systems Engineering - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/systems-engineering-gr-certificate-online/>)
- Telemetry - Graduate Certificate (p. 211)

Undergraduate Minors

- Aerospace Engineering - Undergraduate Minor (p. 1074)
- Agricultural Engineering - Undergraduate Minor (p. 948)
- Biomedical Engineering - Undergraduate Minor (p. 936)
- Brewery Engineering- Undergraduate Minor (p. 936)
- Computational Engineering- Undergraduate Minor (p. 936)
- Computer Engineering - Undergraduate Minor (p. 981)
- Digital Electronic Applications - Undergraduate Minor (p. 1052)
- Digital Forensics - Undergraduate Minor (p. 1052)
- Electrical Engineering - Undergraduate Minor (p. 981)
- Entrepreneurship - Undergraduate Minor (p. 1060)
- Environmental Engineering - Undergraduate Minor (p. 948)
- Geomatics - Undergraduate Minor (p. 1052)
- Geotechnical Engineering - Undergraduate Minor (p. 949)
- Information Security Technology - Undergraduate Minor (p. 1053)
- Lean Manufacturing and Analytics - Undergraduate Minor (p. 1061)
- Manufacturing - Undergraduate Minor (p. 1053)
- Materials Engineering - Undergraduate Minor (p. 937)
- Mechanical Engineering - Undergraduate Minor (p. 1075)
- Nuclear Chemical Engineering - Undergraduate Minor (p. 937)
- Pre-Law in Intellectual Property - Undergraduate Minor (p. 937)
- Pre-Medicine Studies- Undergraduate Minor (p. 937)
- Renewable Energy Technologies - Undergraduate Minor (p. 1053)
- Structural Engineering - Undergraduate Minor (p. 949)
- Supply Chain and Operations Research Analytics - Undergraduate Minor (p. 1061)
- Systems Engineering - Undergraduate Minor (p. 1062)
- Water Resource Engineering - Undergraduate Minor (p. 950)

Graduate Minor

- Advanced Manufacturing - Graduate Minor (p. 212)
- Materials Engineering - Graduate Minor (p. 217)

Accreditation

The following programs are accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org/>.

- Aerospace Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Engineering Physics
- Industrial Engineering
- Mechanical Engineering

The following programs are accredited by the Engineering Technology Accreditation Commission of ABET, <https://www.abet.org/>.

- Engineering Technology – Civil
- Engineering Technology – Electronics and Computer
- Engineering Technology – Information
- Engineering Technology – Mechanical

The following program is accredited by the Applied and Natural Science Accreditation Commission of ABET, <https://www.abet.org/>.

- Geomatics

The college is a member of the American Society for Engineering Education (ASEE).

Other programs under the College of Engineering, such as Information and Communications Technology, are accredited under the Higher Learning Commission (HLC) institutional accreditation.

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

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

Chemical & Materials Engineering Mission

The New Mexico State University Chemical & Materials Engineering (CHME) Department strives to prepare Chemical Engineering Bachelor of Science graduates to successfully and safely practice the chemical engineering profession, to engage in life-long personal and professional development, and to contribute to the betterment of their community and society. The undergraduate chemical engineering program of the CHME Department is accredited by the Engineering Accreditation Commission of ABET, Inc. Completion of an ABET accredited degree is required for licensure in New Mexico.

Undergraduate Program Information

Chemical engineers solve problems by combining the fundamentals of physical sciences (chemistry and physics) and life sciences (biology,

microbiology, biochemistry) with the principles of engineering analysis, mathematics, and economics. The curriculum of study leading to the BSChE continuously builds on prerequisite knowledge. The capstone course requires completion of a series of seven prerequisite courses, each having its own prerequisites. In this manner, the BSChE produces graduates with highly developed problem-solving capabilities, strong communication and interpersonal skills, and an ability to seek out and assimilate knowledge beyond the classroom. Graduates apply these competencies to solve problems across a wide range of industries in the private and public sectors.

The work of a chemical engineer typically leads to the development of processes that convert raw materials (chemicals) into more useful or valuable products. Chemical engineers are pioneers of modern materials and associated processes that are essential to the fields of:

- nanotechnology;
- fuel cells;
- computer chip manufacture;
- environmental restoration and pollution prevention;
- biomedical, biotechnology and bioengineering;
- pharmaceutical manufacturing;
- food production;
- transportation (automotive and aerospace);
- advanced materials;
- petrochemical and refining;
- chemical synthesis and production; and
- power & energy (including the nuclear industry).

Graduates are also well-prepared to continue the study of law, medicine or advanced engineering topics at the graduate level.

Undergraduate Program Educational Objectives

The Chemical & Materials Engineering Department at New Mexico State University strives to produce undergraduates who will:

1. apply their problem-solving and communication skills to chemical engineering industries, government research labs, academia, and related fields;
2. implement safety practices in their work;
3. be on the path to leadership; and
4. build new skills sets through continuing education and professional development.

These Program Educational Objectives (PEOs), which are modified based on input from our constituencies, are consistent with the missions of NMSU, the College of Engineering and the Department of Chemical & Materials Engineering.

Graduate Program Information

The Department of Chemical and Materials Engineering offers graduate study leading to the M.E., M.S. and Ph.D. degrees with an emphasis in chemical engineering. Admission to the program is in accord with the general regulations of the Graduate School. The Graduate Record Examination (GRE) General Test is required for all applicants. All graduate students are required to pass all graduate engineering courses with a minimum grade of B-.

All graduate students must select a thesis or dissertation advisor by the end of their first semester in the chemical engineering graduate program. In addition, doctoral students must complete their Program of Study and Committee form by the end of their first semester. Masters students must complete their Program of Study form by the end of their first semester. Thesis/dissertation may be pursued in absentia at various industrial sites by special arrangement.

Graduate teaching and research assistantships, fellowships and traineeships are available. For consideration for financial assistance, completed applicants must be received by March 1. All support is contingent upon availability, eligibility and satisfactory progress toward the degree.

Each student admitted to the CHME grad program who has an undergraduate degree in a discipline other than chemical engineering must schedule a meeting with the CHME Department Head to identify undergraduate course deficiencies that the student must take to obtain a graduate degree in chemical engineering.

Graduate Program Educational Objectives

Chemical & Materials Engineering graduate students must:

1. demonstrate skills in the (1) design of experiments or simulations, (2) collection of experimental/simulated data, (3) development of appropriate models, and (4) make appropriate use of those models;
2. complete an independent research project, resulting in at least a thesis/dissertation and peer-reviewed journal article(s);
3. defend original research in front of a panel of peers and experts;
4. be knowledgeable of the contemporary issues that are relevant to their chosen area of research.

Degrees for the Department

Bachelor Degree(s)

- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 934)

Master Degree(s)

- Chemical Engineering - Master of Science in Chemical Engineering (p. 116)
- Chemical Process Industry - Master of Engineering in Chemical Process Industry (p. 116)
- Chemical Process Industry - Master of Engineering in Chemical Process Industry (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/chemical-process-industry-mecpi-online/>)

Doctoral Degree(s)

- Engineering (Chemical Engineering) - Doctor of Philosophy (p. 187)

Minors for the Department

- Biomedical Engineering - Undergraduate Minor (p. 936)
- Brewery Engineering- Undergraduate Minor (p. 936)
- Computational Engineering- Undergraduate Minor (p. 936)
- Materials Engineering - Graduate Minor (p. 217)
- Materials Engineering - Undergraduate Minor (p. 937)
- Nuclear Chemical Engineering - Undergraduate Minor (p. 937)

- Pre-Law in Intellectual Property - Undergraduate Minor (p. 937)
- Pre-Medicine Studies- Undergraduate Minor (p. 937)

Department Head: Joseph H. Holles¹

Associate Department Head: Martha C. Mitchell

Professors Holles¹, Houston, Luo, Mitchell, **Associate Professors** Andersen, Brewer, Manz **Assistant Professors** Martinez-Monteagudo, Zhou **Emeritus Professors** Bhada, Ghassemi, Johnson, Patton, Rockstraw¹

Research Interests:

P.K. Andersen (Ph.D., University of California, Berkeley) physicochemical hydrodynamics, nuclear chemical engineering, modeling and simulation, education and training; *C.E. Brewer* (Ph.D., Iowa State) biomass thermochemical processing, sustainable agriculture, biorenewable resources, brewery engineering; *J.H. Holles*¹ (Ph.D., Virginia) heterogeneous catalysis, structure/property relationships in catalysis, pseudomorphic overlayer bimetallic catalysts, research preparation for undergraduate and graduate students; *J. P. Houston* (Ph.D., Texas A&M) biomedical engineering, biophotonics, flow cytometry; *H. Luo* (Ph.D., Tulane) nanostructured materials, thin films, photovoltaics, batteries, electrocatalysts, photocatalysts; *T.A. Manz* (Ph.D., Purdue) quantum chemistry simulations of materials, catalysis, and space physics; *S. Martinez-Monteagudo* (Ph.D., University of Alberta, Canada) food engineering, valorization of byproduct streams, synthesis of sweeteners, and green extraction methods; *M.C. Mitchell* (Ph.D., Minnesota) computer modeling and simulation of molecular-level phenomena, thermodynamic characterization of aerospace fuels, statistical mechanics, engineering education, diversity and inclusion in STEM; *M. Zhou* (Ph.D., New Mexico State) hydrogen production, CO₂ reduction, fuel cell and solar cell.

¹ Registered Professional Engineer

Chemical Engineering Courses

CHME 101. Introduction to Chemical Engineering Calculations

2 Credits (2)

Introduction to the discipline of chemical engineering, including: an overview of the curriculum; career opportunities; units and conversions; process variables; basic data treatments; and computing techniques including use of spreadsheets.

Prerequisite/Corequisite: MATH 1220G.

Learning Outcomes

1. Describe career opportunities available to holders of a BSChE degree.
2. Find and use learning and advising resources within CHME and Engineering.
3. Create a course registration plan for future semesters that meets the degree and prerequisite requirements for the BSChE in the timeliest manner.
4. Diagram a process with unit operations and material and energy flows.
5. Perform unit analysis and unit conversions accurately and efficiently.
6. Validate calculated results using estimation techniques.
7. Apply the concept of significant figures to numerical answers.
8. Identify and describe process variable measurements using engineering vocabulary.
9. Express and convert concentrations using mass, mole, and volume bases. 1
10. Convert between absolute and relative pressure and temperature scales. 1
11. Perform calculations in Excel using built-in and custom functions. 1
12. Generate 2-D plots of data and functions in Excel. 1
13. Perform a regression of data to a mathematical model.

CHME 102. Material Balances

2 Credits (2)

Perform material balances in single- and multi-phase, reacting and non-reacting systems under isothermal conditions.

Prerequisite: MATH 1220G.

Learning Outcomes

1. Analyze data using trendlines. Linearize when necessary.
2. Use unit conversions when solving problems.
3. Turn a verbal or written problem statement into a diagram and a mathematical form.
4. Write and solve material balances on single and multi-unit processes, for both nonreactive and reactive processes.
5. Identify what phase a substance is in and then be able to use the correct equations to relate volume to mass and moles.
6. Use Raoult's and Henry's law when solving mass balances.

CHME 201. Energy Balances & Basic Thermodynamics

3 Credits (3)

Chemical Engineering energy balances; combined energy and material balances including those with chemical reaction, purge and recycle; thermochemistry; application to unit operations. Introduction to the first and second laws of thermodynamics and their applications. May be repeated up to 3 credits.

Prerequisite: CHME 102 and MATH 1250G.

Prerequisite/Corequisite: CHEM 1216 or CHEM 1215G.

Learning Outcomes

1. Correctly implement unit conversions (outcome (a) an ability to apply knowledge of mathematics, science, and engineering),
2. Analyze and solve elementary material balances on single and multi-unit process, for both nonreactive and reactive processes,
3. Apply the first law of thermodynamics to batch and flow processes,
4. Locate thermophysical property data in the literature and estimate properties when data are not available,
5. Conduct combined material and energy balances around continuous multi-unit processes with and without chemical reaction,
6. Perform process calculations using psychrometric charts, enthalpy concentration diagrams and steam tables,
7. Derive and solve differential equations for transient heat and material balances on dynamic systems.
8. Determine individual learning style and describe how learners of that style can help themselves,
9. Use modern engineering tools (example, Excel) to solve material and energy balance problems

CHME 303. Chemical Engineering Thermodynamics

4 Credits (4)

Applications of the First Law and Second Law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances. Modeling of physical properties for use in energy and entropy balances, heat and mass transfer, separations, reactor design, and process control.

Prerequisite: CHME 201.

Prerequisite/Corequisite: MATH 1511G.

Learning Outcomes

1. Use an engineering approach to solve a problem (identify scope, create diagram, determine knowns and unknowns, apply appropriate equations, calculate solutions and evaluate reasonableness of the solution)
2. Solve engineering problems using material, energy and entropy balances
3. Compile appropriate property data for chemical compounds and mixtures
4. Choose and solve appropriate equations of state
5. Use equilibrium relationships to solve chemical engineering problems
6. Acquire and apply new knowledge as needed, using appropriate learning strategies (maps to ABET Student Outcome seven) by analyzing a current environmental issue in chemical engineering

CHME 305. Transport Operations I: Fluid Flow 3 Credits (3)

Theory of momentum transport. Unified treatment via equations of change. Shell balance solution to 1-D problems in viscous flow. Analysis of chemical engineering unit operations involving fluid flow. General design and operation of fluid flow equipment and piping networks. May be repeated up to 3 credits.

Prerequisite: CHME 201.

Prerequisite/Corequisite: MATH 1521G.

Learning Outcomes

1. Mathematical Solutions: solve applied math problems involving linear ordinary differential equations with boundary conditions; solve partial differential equations that can be analytically solved with boundary conditions; identify how coordinate systems are used with ODEs and PDEs; simplify second order PDEs with assumptions; identify when an analytical solution to a PDE is possible and when numerical methods are required.
2. Basic Fluid Concepts and Calculations: identify the properties of fluids, calculate problems that involve pressure measurements, fluid statics, and fluid kinematics; describe physical phenomena of fluid flow; define and explain viscosity, density, specific gravity, surface forces, velocity fields, Newtonian vs. Non-Newtonian, laminar flow, turbulent flow, Reynold's number, and other fluid motion topics.
3. Bernoulli and Energy Equations: apply the Bernoulli equation to sets of fluid problems; solve energy balances in the context of fluids and fluid motion, distinguish between approximations of and appropriate models for Bernoulli's Equation (i.e friction losses, x , pumps, compressors, turbines, surface forces, gas-liquid flow, non-Newtonian fluids, and the Moody diagram).
4. Momentum Analysis: apply momentum balances using the governing equations of momentum to solve one dimensional velocity profile problems of external or internal viscous fluid flow; interpret the different approximations of the momentum balance; classify differential vs. integral forms of momentum analysis; and calculate problems using the Navier Stoke's Equations.
5. Special topics: identify different turbo- and fluid-machinery; explain why computational fluid dynamics is important; solve problems using external flow with applications: boundary layers, lift, drag; and calculate problems with dimensional analysis methods.

CHME 306. Transport Operations II: Heat and Mass Transfer 4 Credits (4)

Theory of heat and mass transport. Unified treatment via equations of change. Analogies between heat and mass transfer. Shell balance solution to 1-D problems in heat and mass transfer. Analysis of chemical engineering unit operations involving heat transfer. Design principles for mass transfer equipment. May be repeated up to 4 credits.

Prerequisite: CHME 305.

Prerequisite/Corequisite: MATH 392.

Learning Outcomes

1. Adopt a systematic problem solving approach, consistently and effectively.
2. Diagram heat flows for conductive, convective, and radiative processes.
3. Find and use material property values.
4. Convert and use appropriate units of energy, power, flux, etc.
5. Write conservation equations for planar, cylindrical, and spherical systems.
6. Apply assumptions such as steady state, number of dimensions, order of magnitude, and/or constant properties to simplify conservation equations.
7. Solve the energy conservation equation for the temperature distribution using appropriate boundary and/or temporal conditions.
8. Calculate heat fluxes into and out of a control volume.
9. Draw resistance circuits and calculate the overall heat transfer coefficient, U , for compound systems. 1
10. Calculate the temperature distribution, heat flux, efficiency, and effectiveness of extended surfaces such as fins. 1
11. Use lumped capacitance and exact solution models to solve transient heat transfer problems. 1
12. Calculate transport dimensionless numbers and explain what they represent. 1
13. Use fluid velocity profiles to calculate boundary layer shapes and thicknesses. 1
14. Calculate convection heat transfer coefficient, h , for external and internal flows using formulas and graphs of experimental results. 1
15. Explain the causes and relative magnitudes of free convection. 1
16. Calculate free convection coefficients using equations and experimental results. 1
17. Label key regimes and heat transfer features of boiling and condensation curves. 1
18. Compare and contrast parallel, cross, and countercurrent flow in heat exchangers. 1
19. Determine the needed surface areas and/or fluid flow rates for heat exchangers given unit operation or process energy needs. 2
20. Calculate and explain heat exchanger efficiency. 2
21. Predict likelihood and account for consequences of fouling. 2
22. Define radiation terminology such as blackbody, grey surface, emissivity, etc. 2
23. Relate surface temperature to radiation wavelength and energy. 2
24. Calculate the view factor between two surfaces and use it to calculate heat transfer. 2
25. Write and solve the mass and molar forms of the one-D mass conservation equations. 2
26. Calculate absolute and relative species velocities and fluxes. 2
27. Use heat transfer relationships and analogous equations to solve diffusion and advection mass transfer problems. 2
28. Predict which kind(s) of heat transfer will be relevant for a given situation. 2
29. Describe implications of problem solutions and perform additional "what if" calculations to understand patterns in the bigger picture.

CHME 307. Transport Operations III: Staged Operations 3 Credits (3)

Theory of mass transport. Mass transfer coefficients. Analysis of chemical engineering unit operations involving mass transfer and separations. Equilibrium stage concept. General design and operation of mass-transfer equipment and separation sequences. Restricted to Chemical Engineering Majors. May be repeated up to 3 credits.

Prerequisite: CHME 303, CHME 306.

Corequisite: CHEM 313.

Learning Outcomes

1. Determine which kind of separation (e.g., distillation, adsorption, membrane, etc.) is best suited to separate a particular mixture
2. Design various kinds of separation units to achieve a target flow rate and purity
3. Evaluate the cost effectiveness and energy requirements of a separation
4. Perform McCabe-Theile analysis
5. Include efficiencies and mass transfer effects in the design of separation units

CHME 323 L. Transport Operations and Instrumentation Laboratory 2 Credits (6P)

Laboratory experiments demonstrate the principles of process measurement and instrumentation through the determination of thermodynamic properties, transport phenomena properties, heat transfer, and material physical properties. Treatment of data includes regression techniques, analysis of error, and statistical analysis. Restricted to: Chemical Engineering majors. May be repeated up to 1 credit.

Prerequisite: I E 311.

Prerequisite/Corequisite: CHME 306.

Learning Outcomes

1. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework and to achieve the following.
2. Organize and carry out experimental design and actual hands-on experiments.
3. Understand safety regulations and safe operation procedures in the Chemical Engineering laboratory.
4. Be able to analyze and interpret experimental data with theories learned in previous courses.
5. Write organized and cohesive technical and reports.
6. Organize and prepare standard operating procedures.
7. Work effectively in a team environment.
8. Prepare and present technical works and answer questions.

CHME 341. Chemical Kinetics and Reactor Engineering 3 Credits (3)

Analysis and interpretation of kinetic data and catalytic phenomena. Applied reaction kinetics; ideal reactor modeling; non-ideal flow models. Mass transfer accompanied by chemical reaction. Application of basic engineering principles to design, operation, and analysis of industrial reactors. Restricted to: CHME, CMEG, CH E majors. May be repeated up to 3 credits.

Prerequisite: CHME 303, CHME 306.

Learning Outcomes

1. Perform mole balances in systems involving reactions.
2. Calculate conversion in batch and flow systems.
3. Size single and staged continuous-stirred tank, and plug flow reactors.
4. Develop rate laws from mechanisms and experimental data.
5. Calculate pressure drops and the effect on kinetics in packed-bed PFRs.
6. Apply the differential and integral methods of kinetic data analysis.
7. Maximize product selectivity for systems involving multiple reactions.
8. Understand effects of non-isothermal operation and unsteady-state behavior.
9. Apply rate limiting step and quantify performance in catalytic systems. 1
10. Quantify mass transfer limitations on heterogeneous systems. 1
11. Understand the idea of a residence time distribution, and the effect on reactor ideality.

CHME 352 L. Simulation of Unit Operations 2 Credits (2P)

Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover how to access variables, define and converge design specifications and converge tear/recycle streams. Restricted to: CHME majors. May be repeated up to 1 credit.

Prerequisite/Corequisite: CHME 307, CHME 441.

Learning Outcomes

1. Apply Aspen Plus programming solutions to specify and converge unit operations involving: non-rigorous balance units (RSTOIC, SEP, MIX, FSPLIT, SSPLIT DUPL); pressure changers (PUMP, COMPR, VALVE); pipe networks (PIPE, PIPELINE); heat exchangers (HEATER, HEATX); reactors and kinetic models (RPLUG, RCSTR, BATCH, REQUIL, RGIBBS); flash drums and decanters (FLASHII, DECANter); distillation columns (DSTWU, intro to RADFRAC)

CHME 361. Engineering Materials 3 Credits (3)

Bonding and crystal structure of simple materials. Electrical and mechanical properties of materials. Phase diagrams and heat treatment. Corrosion and environmental effects. Application of concepts to metal alloys, ceramics, polymers, and composites. Selection of materials for engineering design. May be repeated up to 3 credits.

Prerequisite: CHEM 1215G or CHEM 1216.

Learning Outcomes

1. Explain the effects of composition, bonding, structure, and defects on material properties.
2. Compute the response of materials to external influences.
3. Predict rates of materials failures.
4. Select materials for applications.

CHME 391. Industrial Employment**1-3 Credits (1-3)**

Employment in chemical, petroleum, food, biotechnology, materials, environmental, pharmaceutical, or other industry relevant to the discipline, with opportunity for professional experience and training in chemical engineering. Requires written report covering work period approved by employer. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Gain educational and work experiences that are directly related to the BSCE curriculum and the student's career goals.
2. Develop an understanding of the demands, responsibilities, and opportunities of professional employment.
3. Be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations.
4. Gain a better understanding of decision-making and implementation processes.
5. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 392. Numerical Methods in Engineering**3 Credits (3)**

Study and application of numerical methods in solving problems commonly encountered in engineering. MATLAB will be used as the working environment for implementing and performing the numerical methods in computers.

Prerequisite/Corequisite: MATH 1521G.

Learning Outcomes

1. Use MATLAB as a tool to solve chemical engineering problems;
2. Import and graph data using MATLAB;
3. Write and use script M-files and function M-files;
4. Understand the differences between script M-files and function M-files and why they are used in different situations;
5. Be able to translate algebraic equations into matrices, and use MATLAB to solve systems of linear algebraic equations;
6. Fit equations to data, obtain parameters, and determine the goodness of fit;
7. Linearize non-linear equations and obtain parameters for the nonlinear equations;
8. Use MATLAB to symbolically and numerically integrate one-dimensional integrals;
9. Solve systems of ordinary differential equations analytically (by hand); 1
10. Solve systems of ordinary differential equations numerically and analytically using MATLAB. 1
11. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 395V. Brewing Science and Society**3 Credits (3)**

An overview of the science of brewing and the interrelationships between society, technology, business, and the evolution of the current beer market. Topics covered are history of brewing and the interrelationships between societal attitudes, technology, and cultural preferences; beer styles and evaluation techniques; production and characteristics of ingredients used in brewing; brewing unit operations; biochemistry of malting, mashing, and fermentation; engineering in the brewery; homebrewing; and societal and health issues related to beer and alcohol. Students must be at least 21 years of age by the first day of instruction of the semester to enroll in this course.

CHME 412. Process Dynamics and Control**3 Credits (3)**

Process modeling, dynamics, and feedback control. Linear control theory and simulation languages. Application of Laplace transforms and frequency response to the analysis of open-loop and closed-loop process dynamics. Dynamic response characteristics of processes. Stability analysis and gain/phase margins. Design and tuning of systems for control of level, flow, and temperature.

Prerequisite(s): CHME 441.

CHME 423 L. Unit Operations Laboratory**2 Credits (6P)**

Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control systems with closed-loop process control, instrumentation and development of empirical models from process data. Includes written and oral reports. May be repeated up to 1 credit.

Prerequisite: CHME 307, CHME 441.

Corequisite: CHME 412.

Learning Outcomes

1. Understand and apply engineering experimentation techniques and safety procedures common to the chemical industry.
2. Apply principles developed in chemical engineering courses to the analysis of chemical engineering processes and unit operations.
3. Know the materials characterization methods.
4. Improve skills necessary for group work—interpersonal skills, coordination of the efforts of several persons, leader and subordinate roles, etc. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework.

CHME 448. Industrial Safety**3 Credits (3)**

An introduction to the fundamentals of chemical process safety, including toxicology, industrial hygiene, source models, fires and explosions, relief systems, hazard identification, risk assessment, environmental fate and transport, hazardous waste generation, pollution prevention, and regulatory requirements. May be repeated up to 3 credits.

Corequisite: CHME 323 L.

Learning Outcomes

1. Demonstrate a knowledge and understanding of the elements of process safety management.
2. Be able to pro-actively identify and analyze safety hazards.
3. Demonstrate knowledge and understanding of risk management tools, programs and processes associated with process safety.
4. Understand the OSHA PSM requirements.
5. Understand and appreciate the need for professional integrity and ethical decision making in the professional practice of engineering.
6. Demonstrate an understanding of issues encountered including business, environmental, health, safety and public interest issues.

CHME 451. Intellectual Property for Engineers and Scientists**3 Credits (3)**

An overview of intellectual property with an emphasis on patents. Terminology, patentability requirements, invention disclosures, inventorship, scope of claims, patent application content and the patent prosecution process, and post-allowance matters including infringement and enforcement. May be repeated up to 3 credits.

Learning Outcomes

1. Assess what kind of protection – patent, trade secret, copyright, trademark – is appropriate for particular intellectual property.
2. Describe relevant subject matter and standards for protection under patent, trade secret, copyright, and trademark.
3. Differentiate inventorship, authorship and ownership in an intellectual property context.
4. Devise search strategies to assess ‘prior art’ and public information that may affect availability of intellectual property protection.
5. Generate sample content for a patent application (including claims) and a trademark application.
6. Analyze office actions and propose solutions for issues raised during patent prosecution and trademark prosecution.
7. Compare and contrast the procedures for obtaining a patent, securing a trademark, registering a copyright and establishing trade secret protection.
8. Describe basic considerations relating to enforcement and infringement of intellectual property.

CHME 452. Chemical Process Design & Economic Evaluation**3 Credits (3)**

Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. May be repeated up to 3 credits.

Prerequisite: CHME 307, CHME 441.

Learning Outcomes

1. Write and explain the meanings of the basic equations related to engineering economic analysis.
2. Formulate mathematical models and solve problems involving process design and economic analysis.
3. Discuss the environmental, social, and economic implications of process design.
4. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 455. Chemical Plant Design**3 Credits (3)**

Design and analysis of integrated process plants. Consideration given to optimizing performance, operability, reliability, safety, control, energy integration, and cost effectiveness. Requires written report covering solution of a capstone design problem. Restricted to: CHME majors.

Prerequisite(s): CHME 452.

CHME 455 L. Chemical Plant Simulation**1 Credit (1P)**

Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control. May be repeated up to 1 credit.

Prerequisite: CHME 412, CHME 352 L.

Learning Outcomes

1. Understand how to input from the Aspen Plus Graphical User Interface (GUI).
2. How to specify unit operations in Aspen Plus.
3. Be able to perform a sensitivity analysis and an optimization.
4. Understand how to apply a design specification in Aspen Plus.
5. Understand how to use Calculator Blocks such as Fortran or Excel.
6. Be able to specify a catalytic reactor with LH kinetics.
7. Be able to optimize a RADFRAC distillation column on an economic basis.
8. Be able to converge complex multicomponent RADFRAC distillations.
9. Be able to use the economics analyzer package in conjunction with a simulation.

CHME 461. Calculation of Material and Molecular Properties**3 Credits (3)**

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CHME 561.

Prerequisite(s): CHEM 1226, MATH 1521G or MATH 1521H, (PHYS 2140 or PHYS 1320G).

CHME 464. Polymer Science & Engineering**3 Credits (3)**

This course covers concepts in science and engineering of macromolecules, such as synthesis and chemistry, characterization of molecular weight, morphology, rheology, and mechanical behavior, structure and property relationships, and polymer processing. Taught with CHME 564. May be repeated up to 3 credits.

Prerequisite: CHEM 313 or CHEM 2115.

Learning Outcomes

1. Describe the fundamental concepts in polymer science and engineering;
2. Analyze the microstructure and molecular weight of polymers;
3. Discuss the chemistry, importance and applications of natural polymers;
4. Interpret different synthesis methods of polymers;
5. Analyze the kinetics of polymerization;
6. Discuss the polymer rheology and viscoelastic behavior of polymers;
7. Explain the characterization and processing of polymers; and
8. Argue the selection of polymer and/or design a specific polymer for specific applications (through final project).
9. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 465. Rheology and Viscoelasticity**3 Credits (3)**

Navier-Stokes equation; non-Newtonian fluids; flow fields; rheometry; viscoelastic models; non-linear viscoelasticity; material functions; complex fluids, including emulsions, suspensions and nanocomposites. Taught with CHME 565. Consent of Instructor required.

Prerequisite(s): CHME 306.

CHME 467. Nanoscience and Nanotechnology**3 Credits (3)**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: PHYS 520. May be repeated up to 3 credits.

Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

CHME 470. Introduction to Nuclear Energy**3 Credits (3)**

Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology.

Prerequisite(s): CHEM 1215G, MATH 1521G or MATH 1521H.

CHME 471. Health Physics**3 Credits (3)**

Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis.

Prerequisite(s): MATH 1521G or MATH 1521H, CHME 470.

CHME 476. Nuclear Fuel Cycles**3 Credits (3)**

Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Consent of Instructor required.

Prerequisite(s): CHME 470.

CHME 478. Electrochemistry: Basics & Applications**3 Credits (3)**

Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.

Learning Outcomes

1. Understand the mechanisms responsible for electrochemical device.
2. Realize the current progress in electrochemistry.
3. Identify the problems and hurdles for electrochemical device practical applications.

CHME 479. Corrosion and Degradation of Materials**3 Credits (3)**

Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstructure on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories.

Prerequisite(s): CHME 361.

CHME 481. Biomedical Engineering and Engineering Healthcare**3 Credits (3)**

Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. May be repeated up to 3 credits.

Prerequisite: CHEM 1226.

Learning Outcomes

1. Solve problems related to the design of biomedical instruments.
2. Apply basic mathematics, biology concepts, and laws of physics and chemistry to solve biomedical engineering type problems.
3. Explain differences in biomedical research and industries.
4. Identify the current challenges in the field of biomedical engineering and predict what investigators and industries are doing to tackle such problems.
5. Critique biomedical engineering research through interpretation of peer-reviewed literature, formal presentations and formal reports.
6. Design a solution to a current biomedical engineering problem by computational modeling, experimental design, and/or researching a specific subject in biomedical engineering (i.e. reading peer-reviewed research articles/manuscripts/textbooks).
7. Engage in hands-on learning of biomedical devices such as the building of a simple flow-cytometer.

CHME 486. Biofuels**3 Credits (3)**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits.

Prerequisite: CHEM 313 or consent of instructor.

Learning Outcomes

1. Understand basic concepts about biomass derived energy;
2. Identify potential biomass feedstocks including energy crops;
3. Understand the concept of 1st generation, 2nd generation and advance biofuels;
4. Understand terminologies related to biomass conversion and biofuel production;
5. Have an understanding of the existing and emerging biomass to energy technologies;
6. Understand and apply mass and energy balances in biomass conversion;
7. Apply engineering thermodynamics, organic chemistry, chemistry of plant materials;
8. Familiarize with characterization of biomass feedstocks;
9. Understand the unit processes/ unit operations involved in biofuel/ bioenergy production; 1
10. Be able to do the basic engineering calculations related to biofuel production; 1
11. Understand the concept of a biorefinery system and be able to develop major unit operations of an integrated biorefinery; 1
12. Describe techno-economic analyses of biofuel conversion technologies; 1
13. Have an understanding of environmental implications; and 1
14. Apply biomass-derived energy in different applications.

CHME 490. Senior Seminar**1 Credit (1)**

Research seminar attended by graduate students is open to CHME undergraduates who are research active May be repeated up to 2 credits. Students must be in Senior Standing to enroll in this course.

Prerequisite(s)/Corequisite(s): CHME 498. Restricted to: CHME, CH E majors.

CHME 491. Special Topics**3 Credits (3)**

Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

CHME 495. Brewing Science & Engineering**3 Credits (3)**

Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll. Crosslisted with: FSTE 430.

Learning Outcomes

1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

CHME 495 L. Brewing Science & Technology Lab**1 Credit (3P)**

Brewing and brewing operations in a one-barrel brewery. Topics addressed will include brewery safety, characteristics and handling of brewing ingredients, recipe formulation, water treatment, wort preparation, fermentation, waste disposal, and packaging.

Corequisite(s): CHME 495.

CHME 498. Undergraduate Research**1-3 Credits (1-3P)**

Provides an opportunity for undergraduate students to work in research or areas of special interest such as design problems and economic studies under the direction of a faculty member. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Prepare a written research report conforming to the format of the CHME writing standard;
2. Articulate a clear research question or problem and formulate a hypothesis;
3. Identify and demonstrate appropriate research methodologies;
4. Define, articulate, and use appropriate terminology, concepts, and theory;
5. Use library and other tools to search for existing body of research relevant to their topic;
6. Know existing body of research relevant to their topic and explain how their project fits;
7. Identify and practice research ethics and responsible conduct in research;
8. Know and apply problem solving skills to constructively address research setbacks;
9. Work collaboratively with other researchers, using listening and communication skills; 1
10. Work autonomously in an effective manner, setting and meeting deadlines; 1
11. Reflect on own research, identifying lessons learned, strengths, and ways to improve; 1
12. Communicate confidently and constructively with graduate students, other researchers, and faculty; 1
13. Explain research to others in the field and to broader audiences through presentations; and 1
14. Articulate the relevance of their research to their coursework and professional future, synthesizing their research, academic, and professional interests and goals. 1
15. Criterion Three Student Outcomes specifically addressed by this course are NOT found in a mapping of outcomes against all CHME courses in the curriculum as this is a technical elective, not a required core course.

CHME 501. Graduate Thermodynamics for Chemical Engineers**3 Credits (3)**

Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics. Restricted to: CHME, CH E majors.

CHME 506. Graduate Transport Phenomena(s)**3 Credits (3)**

Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence.

CHME 516. Graduate Numerical Methods in Chemical Engineering**3 Credits (3)**

Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering.

CHME 542. Graduate Reactor Analysis and Design (s)**3 Credits (3)**

Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems.

CHME 548. Industrial Safety**3 Credits (3)**

Same as CHME 448 with graduate-level projects.

Prerequisite(s): CHEM 1216 or CHEM 1215G.

CHME 564. Polymer Science & Engineering**3 Credits (3)**

Synthesis, structure, property relationships of synthetic polymers. Taught with CHME 464. May be repeated up to 3 credits.

Prerequisite(s): CHME 201, CHEM 314.

CHME 565. Rheology and Viscoelasticity**3 Credits (3)**

This course is an introduction to rheology and viscoelasticity. In particular, the flow behavior of Non-Newtonian Fluids and Viscoelastic Fluids will be covered. Rheometry, the technique for characterization of fluids, will be discussed. Most of the course is quantitative and uses mathematical modeling. Taught with CHME 465.

Prerequisite(s): CHME 306.

CHME 567. Nanoscience and Nanotechnology**3 Credits (3)**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Taught with CHME 467.

Prerequisite(s): (CHEM 1225G or CHEM 1226) and (PHYS 1230G or PHYS 1310G).

CHME 578. Electrochemistry: Basics & Applications**3 Credits (3)**

Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.

Learning Outcomes

1. Understand the mechanisms responsible for electrochemical devices, realize the current progress and identify the problems that challenge the practical applications.

CHME 586. Biofuels**3 Credits (3)**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their compositions; types of biofuels; thermochemical and biochemical conversion technologies; assessment of economic, environmental and social sustainability; and emerging topics in biofuels research and development. Course includes a term paper related to biofuels. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic concepts about biomass derived energy;
2. Identify potential biomass feedstocks including energy crops;
3. Understand the concept of 1st generation, 2nd generation and advance biofuels;
4. Understand terminologies related to biomass conversion and biofuel production;
5. Have an understanding of the existing and emerging biomass to energy technologies;
6. Understand and apply mass and energy balances in biomass conversion;
7. Apply engineering thermodynamics, organic chemistry, chemistry of plant materials;
8. Familiarize with characterization of biomass feedstocks;
9. Understand the unit processes/ unit operations involved in biofuel/ bioenergy production; 1
10. Be able to do the basic engineering calculations related to biofuel production; 1
11. Understand the concept of a biorefinery system and be able to develop major unit operations of an integrated biorefinery; 1
12. Describe techno-economic analyses of biofuel conversion technologies; 1
13. Have an understanding of environmental implications; and 1
14. Apply biomass-derived energy in different applications.

CHME 590. Graduate Seminar**1 Credit (1)**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. May be repeated up to 6 credits. Restricted to: CHME majors.

CHME 594. Professional Communication in Chemical Engineering**2 Credits (2)**

Connections between interpersonal relationships and the effective communication of information. Strategies for formal and informal written and verbal communication in the context of presentations, interviews, reports and publications. Factors affecting non-verbal communication. Special focus will be given to understanding and adapting to the audience's perspective. 2 credits. Open to chemical engineering graduate students or by permission of instructor. This class will prepare you to communicate technical information effectively within a variety of contexts and to a variety of audiences. Class assignments will be partially based on current student needs such as preparing presentations for professional conferences, giving research progress reports, and writing research manuscripts. Restricted to: CHME majors.

Prerequisite(s): CHME graduate student standing.

CHME 595. Chemical Process Design and Business Analysis
3 Credits (3)

Graduate chemical process design principles, emphasizing literature review, patent search, heuristics application, process simulation assistance to process creation, synthesis of reactor and separator trains, second-law analysis, heat and power integration, process equipment mechanical design specifications, process design optimization, cost accounting and capital estimation, annual costs, earnings, and profitability analysis.

Prerequisite(s)/Corequisite(s): CHME 506, CHME 516, CHME 542.

Prerequisite(s): CHME 452, CHME 455 L or equivalent.

CHME 596. Chemical Process Industries Research
1 Credit (1)

Independent graduate-level chemical process design project development, literature search, and proposal/defense.

Prerequisite(s): CHME 595.

CHME 597. Advanced Chemical Process Industry Analysis
2 Credits (2)

In-depth analysis and defense of a timely commercially-relevant chemical process design.

Prerequisite: CHME 596.

CHME 599. Master's Thesis
1-15 Credits (1-15)

Thesis.

CHME 690. Graduate Seminar
1 Credit (1)

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated up to 8 credits. Restricted to: CHME majors.

CHME 698. Ph.D. Research
1-9 Credits (1-9P)

Advanced topics for current research. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.

Learning Outcomes

1. To make progress toward a PhD degree.

CHME 700. Doctoral Dissertation
1-9 Credits (1-9)

Individual research in selected topics of current interest in chemical engineering. May be repeated up to 88 credits.

Learning Outcomes

1. Demonstrate skills in the (a) design of experiments or simulations, (b) collection of experimental/simulated data, (c) development of appropriate models, and (d) make appropriate use of those models;
2. Complete an independent research project, resulting in at least a thesis/dissertation and peer-reviewed journal article(s);
3. Defend original research in front of a panel of peers and experts;
4. Be knowledgeable of the contemporary issues that are relevant to their chosen area of research.

Office Location: Jett Hall 268 (<https://map.nmsu.edu/?ct/>)

Phone: (575) 646-1214

Website: <http://chme.nmsu.edu/> (<http://chme.nmsu.edu>)

Chemical Engineering - Bachelor of Science in Chemical Engineering

The BS Chemical Engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

Requirements (Total Credits 124)

In addition to satisfying the requirements of New Mexico State University and the College of Engineering, CHME majors must pass departmental courses with a grade of C- or better.

CHME majors must have completed CHME 201 Energy Balances & Basic Thermodynamics prior to taking any 400-level CHME elective courses.

Degree requirements can also be found summarized in flow diagrams found on the CHME website (<https://chme.nmsu.edu/academics/undergrad/chme-flow-diagrams/>).

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication	3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
		11
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
<i>Area IV: Social/Behavioral Sciences Course (3 credits) ¹</i>		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing a Wider World ³		3
Departmental/College Requirements		
CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3

CHME 323 L	Transport Operations and Instrumentation Laboratory	2
CHME 352 L	Simulation of Unit Operations	2
CHME 361	Engineering Materials	3
CHME 392	Numerical Methods in Engineering	3
CHME 412	Process Dynamics and Control	3
CHME 423 L	Unit Operations Laboratory	2
CHME 441	Chemical Kinetics and Reactor Engineering	3
CHME 448	Industrial Safety	3
CHME 452	Chemical Process Design & Economic Evaluation	3
CHME 455	Chemical Plant Design	3
CHME 455 L	Chemical Plant Simulation	1
CHME Electives ⁴		6
Non-Departmental Requirements		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
<i>Natural Science</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 433	Physical Chemistry I	3
<i>Engineering</i>		
I E 311	Engineering Data Analysis	3
I E 365	Quality Control	3
Second Language: (not required)		
Electives, to bring the total credits to 124		0
Total Credits		124

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses
Also see the 9-credit hour rule at the bottom of the page. CHMEs meet the 9-credit hour rule through the sequence CHEM 313/314/433, and thus only need to complete 3 credits of VWV.

⁴ chme.nmsu.edu/academics/syllabi/#CHME_Elective_Courses (https://chme.nmsu.edu/academics/Syllabi.html#CHME_Elective_Courses)

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
CHME 101	Introduction to Chemical Engineering Calculations	2
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
ENGL 1110G	Composition I	4
Area VI: Creative and Fine Arts Course ²		3
Credits		17

Spring

CHME 102	Material Balances	2
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
COMM 1115G	Introduction to Communication	3
Credits		17

Second Year

Fall		
CHME 201	Energy Balances & Basic Thermodynamics	3
CHEM 313	Organic Chemistry I	3
MATH 2530G	Calculus III	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGL 2210G	Professional & Technical Communication	3
Credits		16

Spring

CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
I E 311	Engineering Data Analysis	3
CHEM 314	Organic Chemistry II	3
MATH 392	Introduction to Ordinary Differential Equations	3
Credits		16

Third Year

Fall		
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 323 L	Transport Operations and Instrumentation Laboratory ⁵	2
CHME 361	Engineering Materials	3
CHME 392	Numerical Methods in Engineering	3
CHEM 433	Physical Chemistry I	3
CHEM 315	Organic Chemistry Laboratory	2
Credits		17

Spring

CHME 307	Transport Operations III: Staged Operations	3
CHME 352 L	Simulation of Unit Operations	2
CHME 441	Chemical Kinetics and Reactor Engineering	3
Area IV: Social/Behavioral Sciences Course ²		3

CHME Elective ⁴	3
Credits	14
Fourth Year	
Fall	
CHME 412	Process Dynamics and Control 3
CHME 423 L	Unit Operations Laboratory ⁵ 2
CHME 448	Industrial Safety 3
CHME 452	Chemical Process Design & Economic Evaluation 3
IE 365	Quality Control 3
Credits	14
Spring	
CHME 455	Chemical Plant Design 3
CHME 455 L	Chemical Plant Simulation 1
CHME Elective ⁴	3
Area V: Humanities Course ²	3
Viewing a Wider World Course ³	3
Credits	13
Total Credits	124

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

² See the General Education (p. 220) section of the catalog for a full list of courses. For Area IV,V, and VI courses, students may take them at any time their schedule allows.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Also see the 9-credit hour rule at the bottom of the page. CHMEs meet the 9-credit hour rule through the sequence CHEM 313/314/433, and thus only need to complete 3 credits of VWV.

⁴ chme.nmsu.edu/academics/syllabi/#CHME_Elective_Courses (https://chme.nmsu.edu/academics/Syllabi.html#CHME_Elective_Courses)

⁵ CHME 323L and CHME 423L are generally offered fall and spring semesters. Students can take them either semester.

Biomedical Engineering - Undergraduate Minor

The Biomedical Engineering minor-of-study is a 20-credit hour program of study designed to accomplish two objectives:

1. Require courses in basic biology, anatomy, physiology to provide students a basic understanding of life and the design and mechanics/dynamics of the human body. Also required is the only biomedical engineering course taught on the NMSU campus.
2. Permit students to select from a wide range of elective courses (<https://chme.nmsu.edu/academics/minors/biomedical-engineering/>) (<https://chme.nmsu.edu/academics/minors/biomedical-engineering/>) numbered above 400 that emphasize engineering topics with application to the design and development of medical devices.

Prefix	Title	Credits
Required Courses		
CHME 481	Biomedical Engineering and Engineering Healthcare	3

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 353	Pre-Professional Human Anatomy	4
BIOL 354	Physiology of Humans	3
Electives		6
Total Credits		20

Brewery Engineering- Undergraduate Minor

It has long been recognized that the study of chemical engineering is appropriate to the understanding of a vast range of concepts associated with the brewing industry. In 1935, an article by M. B. Donald described many of the fundamental process steps for which the BS degree in Chemical Engineering prepares a student to begin work in the industry.

The following 18 credit hour minor of study is designed to prepare CHME students for careers in the brewing industry or as a craft brew entrepreneur as per the 4-year curriculum suggestions by the Master Brewer's Association of the Americas. Elective courses are to be selected from the lists and guidelines maintained on the Brewery Engineering minor of study webpage (<https://chme.nmsu.edu/academics/minors/brewery-engineering/>).

Prefix	Title	Credits
CHME 395V	Brewing Science and Society	3
CHME 495	Brewing Science & Engineering	3
CHME 495 L	Brewing Science & Technology Lab	1
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BCHE 395	Biochemistry I	3
Electives		3
Total Credits		18

Computational Engineering- Undergraduate Minor

The minor in Computational Engineering is designed to provide students with a concentration in the broad spectrum of computations in engineering, including experience with an object-oriented programming language, a background in computational math techniques, and a number of courses that develop or apply engineering software across a broad base of engineering design problems.

Electives must be taken from the list maintained on the Computational Engineering minor webpage (<https://chme.nmsu.edu/academics/minors/computational-engineering/>)

Prefix	Title	Credits
CHME 392	Numerical Methods in Engineering	3
or M E 261	Mechanical Engineering Problem Solving	
Choose one from the following:		3
IE 311	Engineering Data Analysis	
STAT 371	Statistics for Engineers and Scientists I	
Choose one from the following:		3
C S 151	C++ Programming	
ICT 352	Software Technology I	
E T 262	Software Technology I	

An equivalent pre-approved object-oriented programming course	
Electives	9
Total Credits	18

Materials Engineering - Undergraduate Minor

The Materials Engineering minor at New Mexico State University is part of a materials education program that addresses the growing demand for engineers and scientists with understanding of the wide range of materials, their properties and means of characterization. A student must pass 18 credits of courses with a grade C- or better. The minor elective courses are chosen from list available on the Chemical and Materials Engineering website (<http://chme.nmsu.edu/academics/minors/materials-engineering/>). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 361	Engineering Materials	3
Electives ¹		15
Total Credits		18

Nuclear Chemical Engineering - Undergraduate Minor

The Nuclear Chemical Engineering minor at New Mexico State University is part of a nuclear education program that addresses the growing demand for engineers and scientists with background in the nuclear industry. A student must pass 18 credits of elective courses with a grade C- or better. The courses are upper division courses. Three elective courses must be selected from the list maintained on the CHME website (<http://chme.nmsu.edu/academics/minors/nuclear-chemeng/> (<https://chme.nmsu.edu/academics/minors/nuclear-chemeng/>)). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 470	Introduction to Nuclear Energy	3
CHME 476	Nuclear Fuel Cycles	3
Electives		12
Total Credits		18

Pre-Law in Intellectual Property - Undergraduate Minor

The Pre-Law Intellectual Property minor at New Mexico State University is part of a pre-law education program that addresses the growing demand for lawyers with a strong understanding of a broad cross-section of STEM subjects. A student must pass 19 credits of courses with a grade C- or better chosen from Pre-Law Intellectual Property minor (<https://chme.nmsu.edu/academics/minors/pre-law-intellectual-property-minor/>) page available on the Chemical and Materials Engineering website. No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 449	Intellectual Property for Engineers and Scientists	3
COMM 351	Persuasion Theory and Practice	3
BLAW 316	Legal Environment of Business	3
ENGL 2130G	Advanced Composition	3
POLS 308	Prepping for Law School Admissions Test	1
POLS 1120G	American National Government	3
PHIL 1145G	Philosophy, Law, and Ethics	3
Total Credits		19

Pre-Medicine Studies- Undergraduate Minor

The Pre-Medical School minor at New Mexico State University is part of a pre-medicine education program that addresses the growing demand for doctors, surgeons, and biomedical researchers with a strong understanding of a broad cross-section of STEM subjects and who model the human body as a series of interacting chemical process units. This minor of study is designed for students seeking a strong pre-med background (for both MCAT prep and program entry prereq completion) or who may be targeting a graduate degree in biomedical engineering. A student must pass 22 credits of courses with a grade C- or better. The minor includes 19 credit hours of required courses, and 3 credit hours of elective courses. No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
CHME 305	Transport Operations I: Fluid Flow	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 353	Pre-Professional Human Anatomy	4
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	1
BIOL 354	Physiology of Humans	3
BIOL 354 L	Laboratory of Human Physiology	1
BCHE 395	Biochemistry I	3
Elective		3
Total Credits		22

Civil Engineering Undergraduate Program Information Mission Statement

The mission of the Civil Engineering Department for the undergraduate program is to offer a high-quality accredited Bachelor of Science (B.S.) degree that prepares our graduates for professional licensure leading to successful civil engineering careers in the industry and government, and for success in graduate education. Toward this end, the Civil Engineering Department will recruit and retain qualified and diverse faculty that are committed to student learning and development, and serve as role models to the undergraduate students.

Continued excellence in our undergraduate program is paramount to our mission by providing a strong technical foundation to our graduates for engineering design and problem solving; preparing quality graduates

for licensure and professional careers in civil engineering; implementing modern and effective learning methods; maintaining close student-faculty learning interactions; and instilling life-long learning skills and goals for professional growth after graduation.

Program Educational Objectives

Through NMSU's high-quality accredited civil engineering program, graduates will:

1. Be successfully employed in civil engineering or related careers and will become independent thinkers, ethical leaders, effective communicators, and collaborative professionals.
2. Be prepared to pursue professional licensure, appropriate certifications, graduate degrees, and/or professional development activities by fostering life-long learning skills and strategies.
3. Be competitive with graduates from programs across the world through their experience interacting with recognized faculty and industry professionals, and excelling in intercollegiate activities.
4. Build on fundamental knowledge and apply technical skills across disciplines in civil engineering and related fields to make data-driven decisions using engineering judgement.

Program Criteria

The Civil Engineering curriculum is developed based on the program criteria established collaboratively by the Engineering Accreditation Commission (EAC) of ABET Inc. and the American Society of Civil Engineers (ASCE). The curriculum specifically prepares civil engineering students at the baccalaureate level to graduate with the ability to:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, general chemistry, and probability and statistics to assess uncertainty.
2. Analyze and solve problems in various areas of civil engineering.
3. Conduct experiments associated with civil engineering, as well as analyze and interpret the collected data.
4. Design a system, component, or process in various civil engineering contexts considering sustainability.
5. Explain basic concepts related to project management, business, public policy, and leadership.
6. Analyze issues related to professional ethics and explain the importance of professional licensure.

In accordance with the program criteria of ABET and ASCE, the Civil Engineering faculty responsible for teaching design-oriented courses are qualified in their respective professional areas by means of licensure, or a combination of education and design experience. Furthermore, the faculty are given responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

Graduate Program Information

Mission Statement

The mission of the Civil Engineering Department regarding graduate education is to provide research-based and practice-oriented post-baccalaureate programs leading to Master of Science (M. S.), Master of Engineering (M. E.), and PhD degrees for students in the areas of environmental, geotechnical, structural, transportation, and water resources engineering. Toward this end, the Civil Engineering Department will recruit and retain qualified and diverse faculty that are committed to

student learning and development, scholastic and research excellence, and professional service.

Continued excellence in our graduate program is paramount to our mission by providing advanced academic and technical foundations to our graduates; providing interdisciplinary and collaborative research opportunities and teaching experiences; implementing learning methods that promote critical-thinking and problem-solving; seeking external funding to support innovative research and graduate assistantships; and fostering an intellectual and creative environment that values diversity (of people, research and interests) and research ethics.

The Civil Engineering Department offers excellent opportunities for advanced study and professional training in several fields leading to the M.E. in Civil Engineering, M.S. in Civil Engineering, M.S. in Environmental Engineering, and Ph.D. degrees. Students work closely with the faculty on contemporary issues including, but not limited to, applications of machine / deep learning, biogeotechnologies, evapotranspiration monitoring of crops and riparian vegetation, ground stabilization, groundwater recharge, high performance materials, non-destructive testing and evaluation, remote sensing, renewable energy, resilient infrastructure, reservoir evaporation monitoring, riparian rehabilitation, structural health monitoring, sustainable construction, and water treatment and reuse.

The department has excellent facilities for teaching and research purposes including laboratories for mechanical, chemical and biological research. In addition, the department conducts research at various field sites located throughout New Mexico in collaboration with local, state, and federal agencies. Noteworthy features of the graduate programs are the energetic, highly motivated faculty and the low student-faculty ratio. The department regularly has several ongoing research projects of various size and scope employing graduate and undergraduate students. Teaching and research assistantships are available to qualified students and office space is normally provided to M.S. thesis and PhD students.

Students enrolling for graduate studies in civil engineering must have received a bachelor's degree in engineering or one of the allied fields. A candidate for the M.S. in Civil Engineering or M.S. in Environmental Engineering degree may choose either a thesis or a non-thesis track. The M.E. in Civil Engineering degree requires only coursework. When a student enrolls for the Ph.D. program, a doctoral committee is formed to assist the student in planning a program appropriate to the student's background and goals and to administer the required examinations. All Ph.D. candidates in civil engineering must have a demonstrated proficiency in English and two research tools. Mutual understanding between the Ph.D. candidate and his or her doctoral committee on the final nature of these two research tools will be on an individual basis.

Master's Accelerated Program

The Master's Accelerated Program (MAP) option provides students the opportunity to complete a B.S. in Civil Engineering and a master's degree (M.E. in Civil Engineering, M.S. in Civil Engineering or M.S. in Environmental Engineering) with 144 to 150 credit hours; the non-accelerated path requires 156 credit hours (B.S. requires 126 credit hours plus the M.E. or M.S. which require 30 credit hours each). Students accepted into this program will follow the normal path of the Civil Engineering undergraduate curriculum, of which up to 12 credit hours comprised of senior-level (> 450) and/or graduate-level (> 500) courses will be counted towards the master's degree; the MAP courses must be approved by the department head and completed with a grade of B or better. When students receive their bachelor's degree in Civil Engineering, there are 18 to 24 credit hours left for the master's degree which can

be completed in 2 to 3 semesters for full-time students. Students must apply for admission during the final semester of their junior year and obtain prior approval by the department head to pursue the MAP option.

Degrees for the Department

Bachelor Degree(s)

- Civil Engineering - Bachelor of Science in Civil Engineering (p. 946)

Master Degree(s)

- Civil Engineering - Master of Engineering in Civil Engineering (p. 118)
- Civil Engineering - Master of Science in Civil Engineering (p. 119)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 143)

Doctoral Degree(s)

- Engineering (Civil Engineering) - Doctor of Philosophy (p. 188)

Minors for the Department

- Agricultural Engineering - Undergraduate Minor (p. 948)
- Environmental Engineering - Undergraduate Minor (p. 948)
- Geotechnical Engineering - Undergraduate Minor (p. 949)
- Structural Engineering - Undergraduate Minor (p. 949)
- Water Resource Engineering - Undergraduate Minor (p. 950)

Department Faculty Members

Professors Bandini¹ (Assoc. Department Head), Jáuregui¹ (Associate Dean of Academics), Khandan¹, Newton¹ (Interim Department Head), Papelis (Director of Carlsbad Environmental Monitoring & Research Center), Reddi¹ (Dean of College of Engineering), White¹ (Emeritus), Xu

Associate Professors Bawazir, Cho¹, Cortes, Wang, Y. Zhang²

Assistant Professors Choe¹, Li, Q. Zhang

Professors of Practice Al Aqtash

U. Al Aqtash, Ph.D. (New Mexico State) – geotechnical engineering; P. Bandini, Ph.D. (Purdue) – geotechnical engineering; A. S. Bawazir, Ph.D. (New Mexico State) – agricultural/water resources engineering; H. Cho, Ph.D. (Texas A&M) – water resources engineering; D. Choe, Ph.D. (Texas A&M) – structural engineering; D. Cortes, Ph.D. (Georgia Tech) – geotechnical engineering; D. V. Jáuregui, Ph.D. (Texas-Austin) – structural engineering; N. N. Khandan, Ph.D. (Drexel) – environmental engineering; R. Li, Ph.D. (Florida State) – environmental engineering; C. Newton, Ph.D. (Washington) – structural engineering; L. Papelis, Ph.D. (Stanford) – environmental engineering; L. N. Reddi, Ph.D. (Ohio State) – geotechnical engineering; H. Wang, Ph.D. (Lanzhou-China) – environmental/materials engineering; K. R. White, Ph.D. (Texas Tech) – structural engineering; P. Xu, Ph.D. (ENGREF, Paris, France) – environmental engineering; Q. Zhang, Ph.D. (Pittsburgh) – structural engineering; Y. Zhang, Ph.D. (Missouri-Columbia) – environmental engineering.

¹Professional Engineer (PE) in United States

²Professional Engineer (PEng) in Canada

Agricultural Engineering Courses

A EN 459. Groundwater, Wells & Pumps

3 Credits (3)

Occurrence and movement of groundwater; design of water wells; selection and specification of pumps and power units. May be repeated up to 3 credits.

Prerequisite: C E 382 or consent of instructor.

Learning Outcomes

1. Understand the occurrence and movement of groundwater in aquifers, and extraction of it.
2. Ability to interpret pump specifications and data.
3. Select and detail power units for pumping systems.

A EN 478. Irrigation and Drainage Engineering

3 Credits (2+3P)

Design and operation of surface and sprinkler irrigation systems; pumping and conveyances; introduction to principles and practices of drainage systems and wells.

Prerequisite: C E 382 or consent of instructor.

A EN 498. Special Topics

1-3 Credits

May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

Civil Engineering Courses

C E 109. Computer Drafting Fundamentals

3 Credits (2+2P)

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and E T 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

C E 151. Introduction to Civil Engineering

3 Credits (3)

Problem solving and use of computer software for civil engineering applications. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 1220G.

C E 198. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 233. Mechanics-Statics**3 Credits (3)**

Engineering mechanics using vector methods. May be repeated up to 3 credits.

Prerequisite(s): MATH 1521G or MATH 1521H, PHYS 1310G and cumulative GPA of 2.0.

C E 234. Mechanics-Dynamics**3 Credits (3)**

Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits. Crosslisted with: M E 234.

Prerequisite(s): C E 233, MATH 1521G or MATH 1521H, PHYS 1310G.

C E 256. Environmental Engineering and Science**3 Credits (3)**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: ENVS 2111

Prerequisite: CHEM 1215G and MATH 1511G or ENGR 190.

Learning Outcomes

1. To understand the nature of water quality parameters in the context of Civil Engineering and Environmental Science (Water Treatment/Wastewater Treatment/Environmental Science)
2. To learn to apply engineering and scientific solutions to water quality problems
3. To understand environmental regulations and their consequences on the design of pollution control systems

C E 256 L. Environmental Science Laboratory**1 Credit (1P)**

Laboratory experiments associated with the material presented in C E 256. Same as ENVS 2111L.

Corequisite(s): C E 256.

C E 298. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 301. Mechanics of Materials**3 Credits (3)**

Stress, strain, and elasticity of materials. May be repeated up to 3 credits.

Prerequisite: ENGR 233.

Learning Outcomes

1. Calculate deformations, stresses, and strains of various types of members under loading.
2. Calculate principal stresses and strains.
3. Perform two-dimensional stress and strain transformation.
4. Analyze statically indeterminate structures using the method of consistent deformations.
5. Construct shear and moment diagrams for beam type structures.
6. Calculate beam deflections and rotations using various methods.
7. Determine buckling loads for elastic columns.

C E 311. Civil Engineering Materials**3 Credits (2+3P)**

Introduction to the structure, physical properties, testing and mechanical behavior of civil engineering materials and components made from these materials.

Prerequisite: C E 301.

C E 315. Structural Analysis**4 Credits (3+3P)**

Classical analysis of determinate and indeterminate structures; introduction to modern methods of structural analysis using computer programs.

Prerequisite(s): C E 301.

C E 331. Fluid Mechanics and Hydraulics**3 Credits (3)**

Fluid Mechanics and Hydraulics. Fundamentals and theory of fluid mechanics, compressible fluids, flow of incompressible fluids in open and closed conduits.

Prerequisite: PHYS 1310G, ENGR 233 or C E 233.

Learning Outcomes

1. Students learn how to read and interpret problem statements related to fluid mechanics and hydraulics, how to work in teams as well as apply critical thinking skills to solve problems.
2. Students develop an understanding of the theories and principles of hydraulics to understand hydraulic engineering components and subsystems.

C E 331 L. Fluid Mechanics and Hydraulics Laboratory**1 Credit (1P)**

Fundamentals and Theory of Fluid Mechanic, compressible and incompressible flow of fluids in open and closed conduits.

Prerequisite(s)/Corequisite(s): C E 331. Restricted to: C E majors.

C E 355V. Technology and the Global Environment**3 Credits (3)**

A scientific basis for understanding changes in the global environment that result through the complex interactions of natural phenomena and the impacts of the activities of man.

Prerequisites: junior or senior standing, and the general education requirements for math and natural sciences.

C E 356. Fundamentals of Environmental Engineering**3 Credits (3)**

Introduction to water treatment and water pollution and the analysis and design of selected treatment processes.

Prerequisite(s): C E 256.

C E 357. Soil Mechanics**3 Credits (2+3P)**

Engineering properties of soils, consolidation settlement, compaction, water flow through soils, geostatic stresses, soil shear strength, lateral earth pressure, and soil laboratory testing.

Prerequisite: GEOL 1110G and C E 301.

Learning Outcomes

1. The course covers the basic principles governing the mechanical behavior of soils.
2. Students will develop an understanding of soil mechanics, flow through porous media, and mass-volume relationships, as well as the laboratory methods for measuring the mechanical and index properties of soils.
3. Students will be able to interpret and use the laboratory test results for soil classification and for solving simple geotechnical engineering problems.

C E 382. Hydraulic and Hydrologic Engineering**3 Credits (3)**

Analysis and design of hydraulic systems, including pipe networks, open channels, regulating structures, and pumping systems. Surface water and groundwater hydrology, analysis and design. May be repeated up to 3 credits.

Prerequisite(s): C E 331 and C E 331 L.

C E 398. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 435. Technical Communication for Engineers**3 Credits (3)**

The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types.

Learning Outcomes

1. Ability to write in a way that is clear.
2. Ability to write in a way that is concise.
3. Ability to write in a way that is concrete.

C E 444. Elements of Steel Design**3 Credits (3)**

Analysis and design of tension members, beams, columns, and bolted and welded connections.

Prerequisite(s)/Corequisite(s): C E 311. **Prerequisite(s):** C E 315.

C E 445. Reinforced Concrete Design**3 Credits (3)**

Design and mechanics of structural reinforced concrete members.

Prerequisite(s)/Corequisite(s): C E 311. **Prerequisite(s):** C E 315.

C E 452. Geohydrology**3-4 Credits (3+1P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: ENVS 452 and GEOL 452.

Prerequisite(s): Junior or Senior.

C E 454. Wood Design**3 Credits (3)**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 455, Masonry Design.

Prerequisite(s)/Corequisite(s): C E 311. **Prerequisite(s):** C E 315.

C E 455. Masonry Design**3 Credits (3)**

Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454.

Prerequisite: C E 315.

Prerequisite/Corequisite: C E 311.

Learning Outcomes

1. Introduce students to topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to understand the code requirements applicable to problems in masonry design.

C E 457. Foundation Design**3 Credits (2+3P)**

Application of principles of classical soil mechanics to the design of shallow and deep foundations, and the fundamentals of geotechnical site investigation.

Prerequisite(s): C E 357.

C E 469. Structural Systems**3 Credits (3)**

Design of structural systems for buildings and bridges. May be repeated up to 3 credits.

Prerequisite(s): C E 444 or C E 445.

C E 470. Design of Municipal and Hazardous Waste Landfills**3 Credits (3)**

Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills.

Prerequisite(s): C E 357 and C E 452, or consent of instructor.

C E 471. Transportation Engineering**3 Credits (3)**

Highway and traffic design and systems. Students must be in junior or senior standing to enroll.

Prerequisite: MATH 1521G.

Learning Outcomes

1. Provide understanding of the principles of transportation engineering with a focus on highway engineering and traffic analysis
2. Provide basic skill set that will allow a student to address most of the transportation problems that are likely to appear in professional practice and on the Fundamentals of Engineering exam (FE) and the Principles and Practice of Engineering exam (PE)
3. Provide foundation for future coursework in transportation should a student wish to pursue further coursework in the field

C E 477. Engineering Economics and Construction Management**3 Credits (3)**

Engineering economics, construction and project management.

Prerequisite/Corequisite: C E 357.

Learning Outcomes

1. Understand time value of money and be able to perform economic analyses on engineering problems to determine whether a given project is worthwhile or to prioritize multiple alternatives based on present worth.
2. Understand the mathematical and ethical implications of benefit/cost and internal rate of return analyses
3. Estimate durations and requirements of individual construction tasks
4. Develop construction schedules using Critical Path Method (CPM) Analysis
5. Understand the legal and ethical concerns involved in economic analysis and construction engineering.

C E 479. Pavement Analysis and Design**3 Credits (3)**

Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, and rehabilitation concepts.

Prerequisite(s): C E 357.

C E 481. Civil Engineering Capstone Design**3 Credits (3)**

Culminating multidisciplinary project-oriented capstone design. Ethics, professional development, global issues.

Prerequisite(s)/Corequisite(s): C E 457, C E 471, C E 477. **Prerequisite(s):** C E 356, C E 382, and either C E 444 or C E 445.

C E 482. Hydraulic Structures**3 Credits (3)**

Engineering design of water-regulating structures. Capstone design course. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): C E 477. **Prerequisite(s):** C E 382.

C E 483. Surface Water Hydrology**3 Credits (3)**

Hydrologic cycle and relationships between rainfall and surface water runoff.

Prerequisite: C E 331 or consent of instructor.

C E 485. Design of Earth Dams**3 Credits (3)**

Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors.

Prerequisite: C E 357, C E 382.

Learning Outcomes

1. Course introduces the students to small earthen dam siting, design and construction based on the knowledge and skills acquired in earlier coursework.
2. Course incorporates engineering standards and realistic constraints and prepares students for entry-level work.
3. Students work in teams to design a small earthen dam.

C E 490. Introduction to Artificial Intelligence for Civil Engineers**3 Credits (3)**

Introduces various machine learning methods for solving various civil engineering problems. Topics include: supervised & unsupervised machine learning; classification and linear regressions; K-nearest neighbor; decision tree, bagging, & boosting; random forest; and support-vector machines.

Prerequisite: STAT 371.

Learning Outcomes

1. Identify appropriate data analysis methods for various civil engineering problems.
2. Perform various Machine Learning (ML) analyses to solve civil engineering problems.
3. Evaluate various forms of Machine Learning (ML) analysis results.

C E 497. Senior Seminar**1 Credit (1)**

Selected topics on the civil engineering profession and orientation for professional practice. Preparation for the FE exam. Students must be able to submit their application for degree while enrolled in this course.

Learning Outcomes

1. Prepare students for professional and ethical aspects of employment or graduate studies.

C E 498. Special Topics**1-3 Credits**

May be repeated for a maximum of 9 credits.

Prerequisite: consent of department head.

C E 501. Advanced Mechanics of Materials**3 Credits (3)**

Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on elastic foundations, column theories, torsion, thick-wall cylinders. Same as M E 501.

Prerequisites: C E 301, MATH 392.

C E 502. Advanced Mechanics of Steel Structures**3 Credits (3)**

Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion.

Prerequisite: C E 444.

Learning Outcomes

1. Introduce students to advanced topics in structural mechanics of steel structures that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in plastic design of steel structures

C E 503. Special Design and Analysis Program**3-6 Credits**

Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. May be repeated once for a total of 6 credits.

Prerequisite: consent of instructor/committee.

C E 504. Advanced Engineering Design**3 Credits (3)**

Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled.

Prerequisite: consent of instructor/committee.

C E 506. Advanced Soil Mechanics**3 Credits (3)**

Stress and strain analyses in soil, stress paths; drained and undrained shear strengths of granular soils and clays, consolidation, liquefaction, soil improvement.

Prerequisite: C E 457 or consent of instructor.

C E 507. Design of Earth Retaining Structures**3 Credits (3)**

Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing.

Prerequisite(s): C E 357.

Prerequisite(s)/Corequisite(s): C E 457.

C E 508. Advanced Soil Behavior**3 Credits (3)**

The course covers particle-scale phenomena that govern the macro-scale behavior of soils. Topics covered in the class include classical concepts as well as contemporary advances in soil mechanics. The students will develop a fundamental understanding of soil-water interaction, theories of contact level deformation, and mass and energy transport through granular media. Consent of Instructor required.

Prerequisite(s): C E 357 or Instructor Consent.

C E 509. Deep Foundations**3 Credits (3)**

Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads.

Prerequisite: C E 457 or consent of instructor.

C E 510. Introduction to Nondestructive Testing**3 Credits (3)**

This course explores the application of different Nondestructive Testing (NDT) methods in material characterization and product qualification.

Prerequisite(s): C E 311 or CHME 361 or Consent of Instructor.

C E 514. Numerical Methods in Civil Engineering**3 Credits (3)**

Mathematical, numerical, and programming foundations of applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB.

Learning Outcomes

1. To provide necessary background and skills to use MATLAB as a programming language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods.

C E 515. Finite Element Methods**3 Credits (3)**

Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software.

Prerequisite: graduate standing or consent of instructor.

C E 531. Open Channel Hydraulics**3 Credits (3)**

Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation.

Prerequisite: C E 382 or consent of instructor.

C E 535. Technical Communication for Engineers**3 Credits (3)**

The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types. Same as C E 435 with differentiated assignments for graduate students.

Learning Outcomes

1. Ability to write in a way that is clear
2. Ability to write in a way that is concise
3. Ability to write in a way that is concrete

C E 544. Advanced Design of Steel Structures**3 Credits (3)**

Connection design; beam-column analysis and design; composite construction; and plate girder design.

Prerequisite: C E 444.

Learning Outcomes

1. Introduce students to advanced topics in steel design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural steel design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural steel design

C E 545. Advanced Concrete Design**3 Credits (3)**

Advanced topics in ultimate strength design of reinforced concrete that include: concrete footings, retaining structures, short and long columns, torsion members, deep beams and shear walls, two-way slabs, and shear and moment transfer at slab-column connections.

Prerequisites: C E 445.

Learning Outcomes

1. Introduce students to advanced topics in reinforced concrete design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural concrete design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural concrete design

C E 547. Bridge Engineering**3 Credits (3)**

Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation.

Prerequisite: C E 444 or C E 445.

Learning Outcomes

1. Introduce students to topics in bridge design that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in bridge design

C E 554. Wood Design**3 Credits (3)**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design.

C E 555. Masonry Design**3 Credits (3)**

Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554.

Learning Outcomes

1. Introduce students to advanced topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to practice masonry design.
3. Provide the background needed to understand the code requirements applicable to difficult problems in masonry design.

C E 557. Water Resources Development**3 Credits (3)**

Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details.

C E 571. Structural Dynamics**3 Credits (3)**

Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading.

Prerequisite: ENGR 234 and C E 315.

Learning Outcomes

1. Introduce students to topics in structural dynamics that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in seismic and blast-resistant design

C E 572. Earthquake Engineering**3 Credits (3)**

Earthquake characteristics; seismic loads; elastic and inelastic response; analysis and design of buildings for earthquakes.

Prerequisites: graduate standing and consent of instructor.

C E 579. Ground Improvement**3 Credits (3)**

The objective of this course is to introduce common ground improvement techniques, including mechanical (compaction, soil reinforcement, preloading and accelerated consolidation) and chemical (cementing, ion-replacement, polymer bonding) stabilization methods, as well as seepage and dewatering. Emphasis will be placed on developing an understanding of the underlying physical and chemical processes involved in each case.

Prerequisite(s): C E 357.

C E 581. Ground Water Hydrology**3 Credits (3)**

Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality.

Prerequisites: MATH 392, G EN 452, and C E 382, or consent of instructor.

C E 582. Statistical Hydrology**3 Credits (3)**

Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. May be repeated up to 3 credits.

C E 585. Slope Stability Analysis and Design**3 Credits (3)**

Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.

Learning Outcomes

1. Be familiar with the implications of drainage conditions and pore water pressure in the soil as they relate to soil shear strength and slope stability.
2. Be able to recognize the differences between short-term and long-term analyses (total versus effective stress analyses) applied to slope stability.
3. Be able to perform hand calculations of slope stability for very simple cases.
4. Be familiar with the set of input data usually required to perform stability analyses using software.
5. Be able to design soil slopes with various soil profiles and geometry and reinforcement using slope stability software.
6. Recognize and understand the effects of geologic and groundwater conditions on the stability of soil slopes.
7. Understand the mechanisms by which the most common methods of slope stabilization work (tie-backs, soil nailing, geosynthetics).

C E 590. Advanced Artificial Intelligence for Civil Engineers**3 Credits (3)**

Deep learning methods for solving civil engineering problems.

Topics include: introduction, backpropagation, training, regulations, and techniques of Neural Networks (NN); image processing using Convolutional Neural Networks (CNN); time-series data analysis using Recurrent Neural Networks (RNN); Gated Recurrent Units; and introduction to Transfer Learning.

Prerequisite: STAT 371 and MATH 392.

Learning Outcomes

1. Identify appropriate data analysis methods and utilize mathematical formulations of Deep Learning (DL) for various civil engineering problems.
2. Perform various Deep Learning (DL) analyses to solve civil engineering problems.
3. Evaluate various forms of Deep Learning (DL) analysis results.

C E 596. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester.

C E 599. Master's Thesis**1-15 Credits**

Thesis.

C E 600. Doctoral Research**1-15 Credits**

Research.

C E 604. Advanced Engineering Topics**3 Credits (3)**

In depth study of a topic at the forefront of environmental engineering & science. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally.

C E 614. Advanced Numerical Methods in Civil Engineering**3 Credits (3)**

Advanced mathematical, numerical, and programming for applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB. Same as C E 514 with differentiated material and assignments for C E 614 students.

Learning Outcomes

1. To provide necessary background and skills to use MATLAB as a programming language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods, and (7) time series analysis such as Fourier transform, wavelet, and basic filtering.

C E 615. Advanced Finite Element Methods**3 Credits (3)**

Finite element method with emphasis on stress analysis. May include development and use of plane stress, plane strain, and 3-D and shell elements. Includes static, dynamic, and nonlinear analysis.

Prerequisite: graduate standing.

C E 682. Topics in Hydrodynamics II**3 Credits (3)**

Selected topics in hydrometeorology, including the transfer of water and energy between the land surface and the lower atmosphere.

Learning Outcomes

1. This course helps lay the foundation for theoretical concepts useful in measurement, analysis and estimation of evaporation/evapotranspiration. Students learn some of the theoretical concepts and relationships useful in the phenomenon of evaporation as well as gain some field experience on measurement of evapotranspiration and open water evaporation.

C E 698. Special Research Programs**1-3 Credits**

May be subtitled. May be repeated for a maximum of 9 credits.

C E 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

Environmental Engineering Courses

ENVE 450. Aquatic Chemistry**3 Credits (3)**

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on acid-base reactions, precipitation-dissolution reactions, complexation, and redox reactions. Same as ENVE 550.

Prerequisite: C E 256.

Learning Outcomes

1. Students will be able to use fundamental principles of physical chemistry as applied to acid-base, precipitation-dissolution, complexation, and redox reactions to determine the composition of waters, including natural waters and waters encountered in water and wastewater treatment processes.

ENVE 451. Unit Processes/Operation of Water Treatment**3 Credits (3)**

Theory and applications of unit processes in environmental engineering. Physical and chemical water treatment methods are emphasized.

Crosslisted with: ENVE 551.

Prerequisite: C E 356.

Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for water treatment, including sedimentation, coagulation, flocculation, filtration, and disinfection.

ENVE 452. Unit Processes/Operation of Wastewater Treatment**3 Credits (3)**

Theory and applications of unit processes in environmental engineering. Biological wastewater treatment methods are emphasized. Crosslisted with: ENVE 552.

Prerequisite: C E 356.

Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for wastewater treatment, including sedimentation, aerobic and anaerobic microbial treatment, and disinfection.

ENVE 456. Environmental Engineering Design**3 Credits (3)**

Design of chemical, physical, and biological operations and processes involved in water and wastewater treatment. Student can also be a graduate student to enroll if they have not completed C E 356.

Prerequisite: C E 356.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 459. Environmental Microbiology**3 Credits (3)**

An introduction to the diverse roles of microorganisms in natural and engineered environments. The topics include cellular architecture, energetics, and growth; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodegradation and bioremediation of contaminants. Students must be a Senior or in Graduate Standing to enroll.

Learning Outcomes

1. Students will be able to demonstrate the significance of microbial processes in natural and engineered processes.

ENVE 487. Air Pollution Control Systems Design**3 Credits (3)**

An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of air pollution control equipment. Students must be a Senior or in graduate standing to enroll.

Learning Outcomes

1. Students will be able to explain the source and nature of air pollution.
2. Students will be able to relate air pollution to regulations using a risk analysis approach.
3. Students will be able to design air pollution control systems.

ENVE 504. Advanced Environmental Engineering Design**3 Credits (3)**

Advanced engineering design covering the subject matter of the Environmental Engineering capstone undergraduate design course plus an additional report or project. May be subtitled. Consent of instructor required.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 550. Aquatic Chemistry**3 Credits (3)**

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 450.

Prerequisite(s): C E 256.

ENVE 551. Unit Processes/Operation of Water Treatment**3 Credits (3)**

Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 451.

Prerequisite(s): C E 356.

ENVE 552. Unit Processes/Operation of Wastewater Treatment**3 Credits (3)**

Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 452.

Prerequisite(s): Consent of instructor.

ENVE 556. Advanced Water Treatment and Reuse**3 Credits (3)**

Overview of both the theoretical and practical aspects of advanced water treatment technologies and water reuse applications. Basic design features of the processes are presented, with emphasis on the underlying principles, including why and how a process works, what the significant variables are, and what the limitations of the process are. Problem solving skills and technical communication skills are emphasized.

Prerequisite: ENVE 551.

Learning Outcomes

1. Students will be able to design advanced water treatment processes, including membrane filtration, electrodialysis, ion exchange, advanced oxidation, photolysis, and distillation.
2. Students will gain knowledge in water reuse applications including water quality criteria, regulations, and implementation issues.

ENVE 557. Surface Water Quality Modeling**3 Credits (3)**

Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Students must be in Graduate standing to enroll.

Learning Outcomes

1. The students will be able to use mathematical models to model the transport of constituents important for water quality, such as bacteria, viruses, nutrients, contaminants, and oxygen, in aqueous environments.

ENVE 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be repeated up to 6 credits.

ENVE 599. Master's Thesis**15 Credits**

Thesis. May be repeated for a maximum of 6 credits.

ENVE 630. Fate and Transport of Environmental Contaminants**3 Credits (3)**

Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem.

Prerequisite: ENVE 557.

Learning Outcomes

1. The students will be able to use mathematical models to model the transport of contaminants in gas, aqueous, and soil environments.

Department Contact Information

Interim Department Head: Craig Newton, PhD

Associate Department Head: Paola Bandini, PhD, PE

Administrative Assistant: Irma Morales

Associate Engineer: Tyler Sims

Program Coordinator: Sandra Fernandez

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Civil Engineering - Bachelor of Science in Civil Engineering Requirements (126 Credits)

In addition to the university requirements for graduation, all students including transfers must satisfy the requirements contained in the academic policies for the NMSU College of Engineering. Students must have a 2.0 grade-point average in all departmental courses and all prerequisites and co-requisites must be taken as required. If a student takes a class and a co-requisite for that class at the same time and does not achieve a grade of C- or better in the co-requisite, the student may take no further classes for which the course or the co-requisite are prerequisite. A student who completes a class three times without achieving a grade of C- or better will be dismissed from the Civil Engineering program, and not allowed to take any Civil Engineering courses from the department.

Students must complete all University degree requirements, which include the following: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 126 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements or elective credits, but may be needed for enrollment in the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communications</i>		
COMM 1115G	Introduction to Communication	3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ECON 2110G or ECON 2120G	Macroeconomic Principles Principles of Microeconomics	3
<i>Area V: Humanities ¹</i>		
<i>Area VI: Creative and Fine Arts ¹</i>		
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
Viewing A Wider World ³		
Departmental/College Requirements		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
STAT 371	Statistics for Engineers and Scientists I	3
<i>Natural Science</i>		
GEOL 1110G	Physical Geology	4
PHYS 1320G & PHYS 1320L or CHEM 1225G	Calculus -Based Physics II and Calculus -Based Physics II Lab General Chemistry II Lecture and Laboratory for STEM Majors	4
<i>Technical</i>		
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
E T 109	Computer Drafting Fundamentals	3
SUR 222	Introduction to Geomatics	3
<i>Civil Engineering</i>		
C E 151	Introduction to Civil Engineering	3
C E 256 & 256 L	Environmental Engineering and Science and Environmental Science Laboratory	4
C E 301	Mechanics of Materials	3
C E 311	Civil Engineering Materials	3
C E 315	Structural Analysis	4
C E 331 & 331 L	Fluid Mechanics and Hydraulics and Fluid Mechanics and Hydraulics Laboratory	4
C E 356	Fundamentals of Environmental Engineering	3
C E 357	Soil Mechanics	3
C E 382	Hydraulic and Hydrologic Engineering	3
C E 445	Reinforced Concrete Design	3
C E 457	Foundation Design	3
C E 471	Transportation Engineering	3

C E 477	Engineering Economics and Construction Management	3
C E 497	Senior Seminar	1
<i>Elective Courses</i>		
Choose two from the following:		
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
C E 444	Elements of Steel Design	
C E 452	Geohydrology	
C E 454	Wood Design	
C E 455	Masonry Design	
C E 460	Site Investigation	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design	
C E 483	Surface Water Hydrology	
C E 510	Introduction to Nondestructive Testing	
C E 544	Advanced Design of Steel Structures	
C E 545	Advanced Concrete Design	
ENVE 450	Aquatic Chemistry	
ENVE 451	Unit Processes/Operation of Water Treatment	
ENVE 452	Unit Processes/Operation of Wastewater Treatment	
ENVE 487	Air Pollution Control Systems Design	
<i>Capstone Design Course</i>		
Choose one from the following:		
C E 469	Structural Systems	
C E 482	Hydraulic Structures	
C E 485	Design of Earth Dams	
ENVE 456	Environmental Engineering Design	
Second Language: (not required)		
Electives, to bring the total credits to 126		
Total Credits		126

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to complete prerequisite(s) prior to enrolling in this course depending on math placement.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
C E 151	Introduction to Civil Engineering ¹	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ²	4
ENGL 1110G	Composition I ²	4

ENGR 190	Introduction to Engineering Mathematics ³	4
Credits		15
Spring		
E T 109	Computer Drafting Fundamentals ⁴	3
GEOL 1110G	Physical Geology ³	4
MATH 1511G	Calculus and Analytic Geometry I ^{2,5}	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab ²	4
Credits		15
Second Year		
Fall		
COMM 1115G	Introduction to Communication ²	3
ECON 2110G or ECON 2120G	Macroeconomic Principles ² or Principles of Microeconomics	3
ENGL 2210G	Professional & Technical Communication ²	3
ENGR 233	Engineering Mechanics I ²	3
MATH 1521G	Calculus and Analytic Geometry II ²	4
Credits		16
Spring		
C E 256 & 256 L	Environmental Engineering and Science and Environmental Science Laboratory ³	4
C E 301	Mechanics of Materials ²	3
ENGR 234	Engineering Mechanics II ²	3
MATH 2530G	Calculus III ²	3
SUR 222	Introduction to Geomatics ³	3
Credits		16
Third Year		
Fall		
C E 315	Structural Analysis ³	4
C E 331 & 331 L	Fluid Mechanics and Hydraulics and Fluid Mechanics and Hydraulics Laboratory ³	4
C E 356	Fundamentals of Environmental Engineering ³	3
STAT 371	Statistics for Engineers and Scientists I ³	3
Select a General Education Area V (Humanities) Course ^{1,5}		3
Credits		17
Spring		
C E 311	Civil Engineering Materials ³	3
C E 357	Soil Mechanics ³	3
C E 382	Hydraulic and Hydrologic Engineering ³	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II ² or General Chemistry II Lecture and Laboratory for STEM Majors	4
Select a General Education Area VI (Creative and Fine Arts) Course ^{1,6}		3
Credits		16
Fourth Year		
Fall		
C E 445	Reinforced Concrete Design ³	3
C E 477	Engineering Economics and Construction Management ⁷	3
MATH 392	Introduction to Ordinary Differential Equations ²	3
Select a A EN, C E, or ENVE Elective Course ^{3,8}		3
Select a Viewing a Wider World (VWW) Course ^{1,9}		3
Credits		15
Spring		
C E 457	Foundation Design ¹⁰	3
C E 471	Transportation Engineering ¹⁰	3

C E 497	Senior Seminar ³	1
Select a A EN, C E, or ENVE Elective Course ^{3,8}		3
Select a Capstone Design Course ^{3,8}		3
Select a Viewing a Wider World (VWW) Course ^{1,9}		3
Credits		16
Total Credits		126

¹ Courses are typically taught in the Fall semester.

² Courses are typically taught in the Fall, Spring and Summer semesters.

³ Courses are typically taught in the Fall and Spring semesters.

⁴ See the Viewing a Wider World (p. 224) section of the catalog to see a full list of courses.

⁵ Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree but students may need to complete any prerequisites prior to enrolling in this course depending on math placement.

⁶ See the General Education (p. 220) section of the catalog for a full list of courses

⁷ Courses are typically taught in the Fall and Summer semesters.

⁸ See your advisor for more detailed information about selecting elective courses that are approved to fulfill this requirement.

⁹ Courses are typically taught in the Spring semester.

Agricultural Engineering - Undergraduate Minor

Prefix	Title	Credits
Soil Science		
Select one from the following:		3-4
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 477	Environmental Soil Physics	
SOIL 479	Environmental Soil Chemistry	
Plant and Animal Science		
ANSC 351V or HORT 365	Agricultural Animals of the World Principles of Crop Production	3
Institutions/Economics		
Select one from the following:		3
AEEC 2130G	Survey of Food and Agricultural Issues	
AEEC 315V	World Agriculture and Food Problems	
AEEC 337V	Natural Resource Economics	
AEEC 384V	Water Resource Economics	
Irrigation		
A EN 478 or A EN 498	Irrigation and Drainage Engineering Special Topics	3
Design		
A EN 459	Groundwater, Wells & Pumps	3
Total Credits		15-16

Environmental Engineering - Undergraduate Minor

This minor will build upon existing B.S. degree programs at NMSU in engineering and environmental science, and provides further preparation in modern and emerging technologies for upgrading the Nation's ageing utilities and infrastructure in the water, energy, and environment sectors. It includes 3 required courses (9 credits) from civil and environmental

engineering, and 3 elective courses (9-10 credits) from civil engineering, environmental engineering, environmental science, and/or engineering technology.

Prefix	Title	Credits
Required courses (3 courses)		9
C E 256	Environmental Engineering and Science ¹	
C E 356	Fundamentals of Environmental Engineering	
ENVE 456	Environmental Engineering Design	
Elective courses (3 courses) ²		9-10
To be selected from the following list of courses (numbered 300-499) ³		
<i>Upper level courses in Civil Engineering</i>		
C E 355V	Technology and the Global Environment	
ENVE 450	Aquatic Chemistry	
ENVE 451	Unit Processes/Operation of Water Treatment	
ENVE 452	Unit Processes/Operation of Wastewater Treatment	
ENVE 459	Environmental Microbiology	
ENVE 487	Air Pollution Control Systems Design	
<i>Upper level courses in Environmental Science</i>		
ENVS 452	Geohydrology ⁴	
ENVS 462	Sampling and Analysis of Environmental Contaminants	
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	
<i>Upper level courses in Engineering Technology</i>		
E T 381	Renewable Energy Technologies	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
Total Credits		18-19

¹ Cross-listed with ENVS 2111 Environmental Engineering and Science

² May all be taken in same department or different departments

³ Courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval and maximum of 6 credits)

⁴ Cross-listed with C E 452 Geohydrology

Geotechnical Engineering - Undergraduate Minor

This minor builds upon existing B.S. degree programs at NMSU in analysis, construction, and design of geotechnical components of civil infrastructure.

Prefix	Title	Credits
Core courses (3 courses)		
C E 301	Mechanics of Materials	3
or E T 310	Applied Strength of Materials	
C E 357	Soil Mechanics	3
or E T 354	Soil and Foundation Technology	
C E 457	Foundation Design	3
Elective courses (3 courses) ¹		9-10
To be selected from the following list of courses (numbered 300-499) ²		
<i>Upper level courses in Civil Engineering</i>		
C E 452	Geohydrology	

C E 470	Design of Municipal and Hazardous Waste Landfills
C E 479	Pavement Analysis and Design
C E 485	Design of Earth Dams
C E 498	Special Topics ³
<i>Upper level courses in Engineering Technology</i>	
E T 355	Site/Land Development and Layout
Total Credits	18-19

¹ elective courses may be taken in the same department or different departments

² courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval)

³ special topics in Civil Engineering include advanced soil mechanics, advanced soil behavior, ground improvement, design of earth retaining structures, deep foundations, and slope stability analysis (requires consent of department head and instructor)

Structural Engineering - Undergraduate Minor

This minor builds upon existing B.S. degree programs at NMSU in analysis, construction, and design of civil, mechanical, and aerospace structures. It includes 3 required courses (10 credits) from civil engineering and 3 elective courses (9-10 credits) from civil engineering, aerospace/mechanical engineering, and/or engineering technology.

Prefix	Title	Credits
Required courses (3 courses)		10
C E 301	Mechanics of Materials	
or E T 310	Applied Strength of Materials	
C E 315	Structural Analysis	
C E 444	Elements of Steel Design	
Elective courses (3 courses) ¹		9-10
To be selected from the following list of courses (numbered 300-499) ²		
<i>Upper level courses in Civil Engineering</i>		
C E 445	Reinforced Concrete Design	
C E 469	Structural Systems	
C E 498	Special Topics ³	
<i>Upper level courses in Aerospace/Mechanical Engineering</i>		
A E 363	Aerospace Structures	
A E 451	Aircraft Design	
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 425	Design of Machine Elements	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
<i>Upper level courses in Engineering Technology</i>		
E T 332	Applied Design of Structures I	
E T 432	Applied Design of Structures II	
Total Credits		19-20

¹ elective courses may be taken in same department or different departments

² courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval)

³ special topics in Civil Engineering include advanced mechanics of materials, advanced mechanics of steel structures, advanced mechanics of concrete, finite element methods, non-destructive testing, and bridge engineering (requires department head approval and may be repeated for maximum of 6 credits)

Water Resource Engineering - Undergraduate Minor

This minor will build upon existing BS degree programs in civil engineering and engineering technology at NMSU in the analysis, design, construction, and mitigation (flood and urban planning) of water infrastructures and waterways.

Prefix	Title	Credits
Core Courses (2 courses)		
C E 331	Fluid Mechanics and Hydraulics	3
or E T 308	Fluid Technology	
C E 331 L	Fluid Mechanics and Hydraulics Laboratory	1
or E T 308 L	Fluid Technology Lab	
C E 382	Hydraulic and Hydrologic Engineering	3
Elective Courses (4 courses) ¹		12
To be selected from the following list of courses (numbered 300-499) ²		
<i>Upper level courses in Civil / Agricultural Engineering</i>		
C E 452	Geohydrology	
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
C E 482	Hydraulic Structures	
C E 483	Surface Water Hydrology	
C E 485	Design of Earth Dams	
<i>Upper level courses in Engineering Technology</i>		
E T 418	Applied Hydraulics	
Total Credits		19

¹ elective courses may be taken in the same department or different departments

² courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval)

Electrical and Computer Engineering Undergraduate Program Information Overview

The undergraduate electrical engineering program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc., and stresses the development of analytical tools and physical concepts required to prepare students for immediate employment or graduate study. The program is flexible, allowing students to choose elective coursework towards concentrations in:

- communications and signal processing,
- computers and microelectronics,
- control and power,
- controls and robotics,

- electromagnetics and photonics, or
- space systems.

Alternatively, students can select "no concentration" for the greatest flexibility in course selection.

Undergraduate Electrical Engineering Program Educational Objectives

The Klipsch School is dedicated to providing a quality, hands-on, educational experience for our students. Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduates during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Related Areas of Study

Electrical and computer engineering students wishing to broaden their educational experience may elect to earn additional bachelor's degrees in

- Engineering Physics
- Computer Science
- Mathematics
- Physics

Klipsch School students may also choose to earn a minor in one or more of the following fields:

- Computer Engineering
- Computer Science
- Mathematics
- Physics

Students must consult with an academic advisor in the offering department for specific requirements related to additional degrees and minors.

Transfer Credit

Credit earned at other institutions is generally accepted; however the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics must be calculus based.
- If the NMSU requirement includes a lab, the transfer credit must include a lab.
- A grade of C-, or better, must have been earned.
- E E Courses numbered 300 or higher, Cornerstone and Capstone courses may not be transferred.
- Transfer credits for courses above 300 level are NOT ACCEPTED.

Master's Accelerated (BS/MS) Program (MAP)

Undergraduate students may apply for acceptance to the Master's Accelerated Program (MAP) after completing 60 semester hours of undergraduate coursework of which a minimum of 25 credit hours must be completed at NMSU. The GPA must be 2.75 or above for admission to the MAP program. The students must meet all other requirements as specified by the BSEE and MSEE programs. The MAP program allows up to 12 credits of NMSU coursework (450 level or higher) taken during

the undergraduate years to be counted toward the master's program of study. Students must receive a grade of B or higher in the courses to be counted for the graduate degree. The courses must logically fit into the master's program. EE courses that are approved for the MAP are those EE electives with a corresponding graduate version:

Prefix	Title	Credits
E E 502	Electricity Markets	3
E E 506	Quantum Computing	3
E E 510	Introduction to Analog and Digital VLSI	3
E E 512	ASIC Design	3
E E 521	Microwave Engineering	3
E E 523	Analog VLSI Design	3
E E 528	Fundamentals of Photonics	4
E E 529	Lasers and Applications	4
E E 537	Power Electronics	3
E E 540	Photovoltaic Devices and Systems	3
E E 541	Antennas and Radiation	4
E E 542	Power Systems II	3
E E 543	Power Systems III	3
E E 548	Introduction to Radar	3
E E 549	Smart Antennas	3
E E 551	Control Systems Synthesis	3
E E 556	Hardware & Software Codesign	3
E E 558	Hardware Security and Trust	3
E E 562	Computer Systems Architecture	3
E E 565	Machine Learning I	3
E E 567	ARM SOC Design	3
E E 573	Signal Compression	3
E E 576	Geometric Algebra	3
E E 581	Digital Communication Systems I	3
E E 588	Advanced Image Processing	3
E E 593	Mobile Application Development	3
E E 596	Digital Image Processing	3
E E 597	Neural Signal Processing	3

More information and the application for the MAP program can be found at: <https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html>

Graduate Program Information

Overview

The Klipsch School of Electrical and Computer Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Areas of emphasis for masters and doctoral students are:

- communications,
- computer engineering,
- controls,
- digital signal processing,
- electromagnetics,
- electric energy systems,
- photonics, and
- microelectronics/VLSI.

Research in the above areas currently being conducted by the faculty ensures that doctoral candidates will work on the frontier of knowledge in these areas. The graduate programs are intended to provide broad

graduate-level training in electrical engineering. In addition, appropriate courses in computer science, industrial engineering, mathematics, physics and business management may be integrated into a graduate student's program of study.

Students desiring to work toward an advanced degree in electrical engineering must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science in Electrical Engineering degree at this institution. For students with undergraduate degrees in other disciplines, see below. For further information on the Klipsch School of Electrical and Computer Engineering, please consult the web page <http://www.ece.nmsu.edu/> (<http://ece.nmsu.edu>).

Faculty Research Interests

- **Communications:** Wireless and Digital Communications, Optical Communications, Error Control Coding, Data Compression, Information Theory, Physical Layer Security, Localization and Navigation.
- **Computer Architecture, Performance, And Security:** Performance Modeling and Simulation, Micro-Architecture Power Optimization, Performance Analysis and Optimization Of Large-Scale Scientific Applications, Heterogeneous HPC Computing for Field-Deployable Systems, Hardware Security and Trust, Hardware Software Co-Design, Embedded System Security, Machine Learning and Artificial Intelligence Security.
- **Digital Signal Processing:** Processing and Analysis Of EEG Signals, Time-Frequency Analysis, and Speech Processing.
- **Electromagnetics:** Propagation Through Dispersive Media (Soil, Seawater, Foliage, Biological Tissues), UWB and Synthetic Aperture Radar Systems, Antennas, Digital Beamforming, Microwave Engineering, Electromagnetic Interference and Compatibility, and Nondestructive Evaluation.
- **Electric Energy Systems:** Renewable Energy Integration, Protection, Advanced Control and Optimization, and Customer Driven Microgrids, Public Utilities Regulation and Management.
- **Machine Learning:** Image Processing and Application Of Machine Learning and Deep Learning To Image Analysis, Focusing on Astronomy And Biomedical Image Analysis, Health Care, and Defense.
- **Microelectronics And VLSI:** Micro Integrated Circuits, Sensors, Wireless Communication With IOT Devices, Signal Processing, Robotics, Analog and Mixed-Signal VLSI Design, Integrated Power Management Circuits, and Micro-Controller Sensor Systems.
- **Photonics:** Optical Wave Propagation through Atmospheric Turbulence, Free Space Optical Communications, Optical Remote Sensing involving Spectral and Polarization Sensing Techniques, and Astronomical Instrumentation Development.
- **Space Systems:** Research in Space Weather, High-Energy Astrophysics, Autonomous Proximity Operations, and Docking Of Small Satellites.

Support for Graduate Students

A number of teaching assistantships, research assistantships and fellowships are available. Teaching assistants are recommended by individual faculty for selection by the ECE Department's Graduate Studies Committee. International students must pass university screening prior to being eligible for selection as a TA. Nominations for new TAs are made by the advisor after a student is admitted. Research assistants are hired directly by the faculty member who has received a contract or grant for research.

The College of Engineering awards graduate scholarships and fellowships on behalf of Electrical and Computer Engineering. These include:

- the MIT/Lincoln Laboratory Fellowship,
- the Paul and Valerie Klipsch Grad Scholarship,
- the Admiral Paul Arthur Grad Scholarship, and
- the Barry Neil Rappaport Grad Scholarship.

Applications can be completed on-line at <https://scholarships.nmsu.edu/>. The priority deadline for the Scholar Dollar\$ is March 1st. The Electrical Utility Management Program has a limited number of fellowships for students interested in pursuing master's degrees in electrical energy systems.

Admission

Prospective graduate students for the Master of Science or Doctor of Philosophy in Electrical Engineering must first meet the entrance requirements of the Graduate School. The prospective US graduate student should make formal application to the Graduate Student Services office (<http://gradschool.nmsu.edu> (<http://gradschool.nmsu.edu/>)). International graduate students must start with the Admissions Office (<https://iss.nmsu.edu/#admissions>). Official transcripts from all undergraduate and graduate institutions must be sent directly to the Graduate School. International students must also submit their TOEFL (Test of English as a Foreign Language) scores. If the applicant meets the Graduate School's minimum requirements, the application is sent to the Klipsch School's Graduate Studies Committee for review. U.S. residents are given every chance of being successful in the pursuit of a graduate degree. If they do not meet the requirements of the Klipsch School, they can enter the Graduate School as "undeclared" where they must demonstrate competence in two or more graduate-level E E courses before they re-apply.

Requirements for Students Without BSEE Degree or Equivalent

Students without a BSEE degree or equivalent preparation will be expected to take classes covering the core knowledge required in our BSEE program. This includes mathematics through differential equations and basic engineering physics. The student's graduate advisor will prepare an individualized deficiency schedule, based on the student's academic background and work experience.

The following courses from our undergraduate program will be considered deficiencies for students without a BSEE

Prefix	Title	Credits
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4

Degrees for the Department

Bachelor Degree(s)

- Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering (p. 969)
- Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering (p. 971)
- Electrical Engineering (Control & Power) - Bachelor of Science in Electrical Engineering (p. 973)
- Electrical Engineering (Controls & Robotics) - Bachelor of Science in Electrical Engineering (p. 975)
- Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering (p. 977)
- Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering (p. 979)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 966)

Master Degree(s)

- Electrical Engineering - Master of Engineering in Electrical Engineering (p. 137)
- Electrical Engineering - Master of Engineering in Electrical Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/electrical-engineering-meee-online/>)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 139)
- Electrical Engineering - Master of Science in Electrical Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/electrical-engineering-msee-online/>)

Doctoral Degree(s)

- Engineering (Electrical Engineering) - Doctor of Philosophy (p. 188)

Minors for the Department

- Computer Engineering - Undergraduate Minor (p. 981)
- Electrical Engineering - Undergraduate Minor (p. 981)

Graduate Certificates in the Department

- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 125)
- Digital Communications - Graduate Certificate (p. 206)
- Digital Signal Processing - Graduate Certificate (p. 206)
- Electric Energy Systems - Graduate Certificate (p. 206)
- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)
- Telemetry - Graduate Certificate (p. 211)

Department Head Steve Stochaj

Professors Borah, Boucheron, Creusere, Dawood, Stochaj, W. Tang, Voelz;

Associate Professors Badawy, Lavrova, Shi;

Assistant Professors Garcia Carrillo, Liu, Mitchell, Sandoval, Wang;

Professors of Practice X. Tang;

Emeritus Professors Carden, Castillo, Giles, Sheila Horan, Stephen Horan, Johnson¹, Jordan, Kersting, Ludeman, Merrill, Petersen, Ranade, Reinfelds, Smolleck¹, Steelman¹, Taylor

¹ Registered Professional Engineer (NM)

Electrical Engineering Courses

E E 200. Linear Algebra, Probability and Statistics Applications

4 Credits (3+3P)

The theory of linear algebra (vectors and matrices) and probability (random variables and random processes) with application to electrical engineering. Computer programming to solve problems in linear algebra and probability.

Prerequisite: C- or better in ENGR 140 and (MATH 1521G or MATH 1521H or ENGR 190).

Learning Outcomes

1. Perform vector and matrix operations, including matrix inversion, eigen analysis, finding basis and dimension of vector spaces and rank of a matrix, and solving a set of linear equations.
2. Calculate probabilities using probability mass, density, and cumulative distribution functions for single and multiple, discrete and continuous random variables, and relate them to electrical engineering applications.
3. Perform simple parameter estimation, such as finding sample mean and variance, and relate to confidence intervals.
4. Describe random processes in the context of signal processing and communications systems problems.
5. Use MATLAB to solve problems involving linear algebra and probability, including designing and performing simple numerical experiments.

E E 240. Multivariate and Vector Calculus Applications

3 Credits (3)

Vector algebra, cylindrical and spherical coordinates, partial derivatives, multiple integrals. Calculus of vector functions through electrostatic applications. Divergence, gradient, curl, divergence theorem, Stokes's theorem, Coulomb's Law, Gauss's Law, electric field, electric potential. Applications in Matlab.

Prerequisite: C- or better in (MATH 1521G or MATH 1521H or ENGR 190) and ENGR 140.

Learning Outcomes

1. Students will demonstrate conceptual understanding of the fundamental principles and theories in vector calculus
2. Students will analyze and solve problems using vector calculus in three coordinate systems

E E 300. Cornerstone Design

2 Credits (1+3P)

Application and realization of engineering principles to a guided team-based design project. Formulation and implementation of test procedures, evaluation of alternate solutions and oral and written communication of the design and test results. Restricted to: E E majors. Restricted to Las Cruces campus only.

Prerequisite: C- or better in ENGR 140 and ENGR 230 and E E 200.

Learning Outcomes

1. Formulate and implement test procedures for validation of requirements.
2. Evaluate alternative design solutions.
3. Document test procedures and design solutions.
4. Implement design to include a printed-circuit board, electronics and coding.
5. Communicate the design and validation both orally and in writing to a wide range of target audiences.
6. Work in teams.

E E 317. Semiconductor Devices and Electronics I

4 Credits (3+3P)

Analysis and design of opamp circuits, diode circuits and single-transistor MOS and BJT amplifiers. Introduction to solid-state semiconductor devices.

Prerequisite: C- or better in ENGR 230 and CHEM 1215G.

Learning Outcomes

1. Analysis and design of single time-constant circuits, op-amp circuits, and linear power supplies.
2. Understanding of solid-state devices.
3. Biasing and small-signal analysis of MOS and BJT single transistor amplifiers.
4. Using computer tools to simulate electronic circuits.
5. Testing electronic circuits using power supplies, function generators, digital multi-meters, and oscilloscopes.
6. Writing and documenting laboratory results.

E E 320. Signals and Systems I

3 Credits (3)

Introduction to the modeling and analysis of continuous- and discrete-time signals and systems using time- and frequency-domain methods suitable for both mathematical approaches and computer-aided simulations.

Prerequisite: C- or better in ENGR 190.

Learning Outcomes

1. Understand different types of signals (continuous-time, discrete-time, periodic, etc.) and how these signals are represented mathematically and in a computer.
2. Understand systems representations (e.g., impulse responses), implementations (e.g., convolution and difference/differential equations), and properties (e.g., linearity).
3. Gain insight into transform-domain analysis for signals and systems.
4. Develop the ability to apply transform domain and LTI analysis to simple applications in signal processing, communications, and controls using Matlab.

E E 325. Signals and Systems II**4 Credits (3+3P)**

Introduction to communication systems including amplitude and frequency modulation. Introduction to control systems including linear feedback systems, root-locus analysis, and graphical representations. Introduction to digital signal processing including sampling, digital filtering, and spectral analysis.

Prerequisite: C- or better in E E 200 and E E 320.

Learning Outcomes

1. To model, analyze, simulate, and perform calculations with continuous- and discrete-time systems.
2. To develop an understanding of basic modulations in communication systems.
3. To gain insight into the basics of control systems.
4. To develop insight into filtering and analysis of digital signals.
5. To learn how to use MATLAB and SIMULINK to perform analysis, design, and simulation of communication, control, and signal processing systems.

E E 333. AC Circuit Analysis and Introduction to Power Systems**3 Credits (2+3P)**

Steady-state analysis of AC circuits, three-phase circuits, and an introduction to power systems.

Prerequisite: C- or better in ENGR 230.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession which will establish background for further studies in power systems.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 340. Fields and Waves**4 Credits (3+3P)**

Static electromagnetic field. Maxwell's equation and time-varying electromagnetic fields. Generalized plane wave propagation, reflection, transmission, superposition and polarization. Transmission line theory. Extensions to optical wave propagation. Applications including Time Domain Reflectometry (TDR) and fiber optic transmission. Laboratory experience with RF/microwave test equipment and optical apparatus.

Prerequisite: C- or better in ENGR 230 and E E 240.

Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations (such as Maxwell's) governing transmission lines, static and time-varying fields, propagation, reflection and transmission of plane waves, waveguides, and antennas.
2. Students will analyze and solve electromagnetic-related problems by applying fundamental principles, theories, and equations (such as Maxwell's equations).
3. Students will demonstrate effective team work.
4. Students will demonstrate the use of RF/microwave test equipment to perform basic RF circuit measurements.

E E 362. Introduction to Computer Organization**4 Credits (3+3P)**

Concepts of modern computer organization, CPU control, pipelining, memory hierarchies, memory mapping, hardware-software interface, and operating systems.

Prerequisite: C- or better in ENGR 120 and MATH 1250G.

Prerequisite/Corequisite: ENGR 140.

Learning Outcomes

1. Be conversant with fundamental concepts of computer organization.
2. Compare and contrast organizational features of different computer.
3. Understand the use of microprocessors and peripheral devices in practical applications

E E 395. Introduction to Digital Signal Processing**3 Credits (3)**

Undergraduate treatment of sampling/reconstruction, quantization, discrete-time systems, digital filtering, z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications. Laboratory will emphasize practical implementation of signal processing including real-time signal processing.

Prerequisite(s): C- or better in E E 325.

E E 400. Undergraduate Research**1-3 Credits**

Directed undergraduate research. May be repeated for a maximum of 9 credits.

Prerequisite: consent of the department head.

E E 403. Geometric Algebra**3 Credits (3)**

Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Taught with E E 576.

Prerequisite: C- or better in E E 320.

Learning Outcomes

1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 405. Electricity Markets**3 Credits (3)**

Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Taught with E E 502.

Prerequisite: C- or better in E E 431.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 406. Quantum Computing**3 Credits (3)**

This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught concurrently with E E 506.

Learning Outcomes

1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 407. Introduction to Control Systems**3 Credits (3)**

This course provides an introduction to the analysis of control systems. The main focus will be on techniques in classical control theory. System dynamics and modeling techniques in both the frequency domain and the time domain will be covered. Students will learn how to transform linear dynamical systems between state-space and frequency domains, and evaluate conditions for stability in each domain. Students will analyze and characterize both the transient and steady-state response, and examine root locus, Bode, and Nyquist plots. Concepts of robust control, including tradeoffs between sensitivity and performance, will be emphasized throughout. Applications will range across electrical, mechanical, chemical, biomedical, and biological systems. Laboratory activities include modeling, analysis and simulation of physical processes.

Prerequisite: C- or better in E E 325 and MATH 392.

Learning Outcomes

1. Obtain mathematical models of electrical and mechanical systems from their idealized elements.
2. Derive the transfer function of a control system.
3. Apply their mathematical knowledge to determine the response of a linear system to various types of inputs.
4. Develop familiarity and confidence with analyzing transient and steady state responses of a linear system.
5. Apply their mathematical knowledge to understand the concept of stability.
6. Develop familiarity and confidence with controller design based on Routh-Hurwitz, Root locus and P, PI, PID modes of control.
7. Develop proficiency in systems simulation using MATLAB and SIMULINK.

E E 409. Hardware & Software Codesign**3 Credits (3)**

This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Taught with E E 556.

Prerequisite: C- or better in ENGR 140 and ENGR 130 and (E E 362 or C S 473).

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.
2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Describe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture

E E 412. ASIC Design**3 Credits (3)**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Taught with E E 512.

Prerequisite: C- or better in E E 480.

Learning Outcomes

1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 431. Power Systems II**3 Credits (3)**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Taught with E E 542.

Prerequisite: C- or better in E E 333.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 432. Power Electronics**3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Taught with E E 537.

Prerequisite: C- or better in E E 317 and E E 333.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 433. Power System Operation**3 Credits (3)**

Basics of power system operation; linear programming, economic dispatch, mixed integer programming, power system security and contingency analysis; RTO operation; generation control; renewable integration.

Prerequisite: C- or better in E E 431.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium.
2. Understand basics of linear programming and can use software to solve simple linear programming problems.
3. Understand the difference between AC and DC power flow. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment.
4. Understand the control schemes in power system, including governor, automatic generation control.
5. Understand the power system security including N-1 criteria, contingency analysis, and security constraints.

E E 440. Photovoltaic Devices and Systems**3 Credits (3)**

Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Taught with E E 540.

Prerequisite: C- or better in E E 317.

Learning Outcomes

1. Name at least three different types of photovoltaic materials and cells;
2. Derive equations governing operation of photovoltaic cells;
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity;
4. Describe principles of operation of the "balance of the system" (BOS) components of the photovoltaic system.

E E 443. Mobile Application Development**3 Credits (3)**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. Taught with E E 593.

Prerequisite: C- or better in C S 151 or C S 152 or C S 172 or C S 271 or C S 451 or C S 452.

Learning Outcomes

1. The objective of this course is to gain an understanding of mobile application development, including Swift, Model-View-Controller (MVC) pattern, Memory management, View controllers, Frameworks: Foundation, CoreGraphics, CoreLocation, MapKit, UIKit, WebKit

E E 444. Advanced Image Processing**3 Credits (3)**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with E E 588.

Prerequisite: C- or better in E E 446.

Learning Outcomes

1. Implement and analyze segmentation of color and grayscale images.
2. Implement and analyze morphological analysis of binary images
3. Implement and analyze compression of images
4. Implement and analyze feature extraction and classification of images
5. Implement and analyze convolutional neural networks (CNNs) for classification of images

E E 446. Digital Image Processing**3 Credits (3)**

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Taught with E E 596.

Prerequisite: C- or better in E E 325.

Learning Outcomes

1. Analyze human visual perception and the implications to science and society
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing
4. Formulate and analyze problems related to color image acquisition, processing, and display
5. Implementing image processing algorithms on computers in Matlab or python

E E 447. Neural Signal Processing**3 Credits (3)**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Taught with E E 597.

Prerequisite: C- or better in E E 325.

Learning Outcomes

1. Demonstrate understanding and skill in the Structure and basic operation of the human brain
2. Demonstrate understanding and skill in processing of EEG brain signals using Matlab and EEGLAB
3. Demonstrate understanding and skill in EEG-related neural modeling
4. Demonstrate understanding and skill in brain signal types and acquisition

E E 448. Signal Compression**3 Credits (3)**

Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Taught with E E 573.

Prerequisite: C- or better in E E 200.

Learning Outcomes

1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/sampling

E E 449. Smart Antennas**3 Credits (3)**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 549.

Prerequisite: C- or better in E E 325 and E E 340.

Learning Outcomes

1. Antenna and Array fundamentals
2. Smart Antenna and Adaptive Array concepts: Uniform and Planar Arrays; Array steering; Array performance criteria; Error effects on beamforming
3. Adaptive Beamforming Algorithms and Architectures: gradient-based algorithms, Sample Matrix Inversion; Least Mean Square; Recursive Least Mean Square; Sidelobes cancellers; Direction of Arrival estimations; Effects of mutual coupling and its mitigation.
4. Applications: Angle of arrival estimation; Diversity combining; Nulling for jammer suppression and clutter cancellation, etc.

E E 452. Introduction to Radar**3 Credits (3)**

Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Recommended foundation: E E 496. Taught with E E 548.

Prerequisite: C- or better in E E 325 and E E 340.

Learning Outcomes

1. Students will demonstrate an understanding of fundamental principles of various types of radar systems and their applications,
2. Students will learn to analyze a given radar system,
3. Students will learn to use simulation techniques to design a radar system that will yield desired characteristics,
4. Students will experience working in groups/teams

E E 453. Microwave Engineering**3 Credits (3)**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521.

Prerequisite: C- or better in E E 340.

Learning Outcomes

1. Students will demonstrate an understanding of fundamental principles and theories related to microwave systems, components, and devices
2. Students will analyze and solve microwave engineering-related problems using the fundamental microwave engineering theories and principles
3. Students will demonstrate the use of microwave engineering design tools
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 454. Antennas and Radiation**4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Taught with E E 541.

Prerequisite: C- or better in E E 340.

Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 458. Hardware Security and Trust**3 Credits (3)**

This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Taught with E E 558.

Prerequisite: C- or better in E E 362.

Learning Outcomes

1. Understand the security goals of information security
2. Understand cryptography basics and their applications
3. Formulate and analyze problems related to security threats in integrated circuits, electronic devices and semiconductor supply chain
4. Formulate and analyze problems related to security countermeasures to the threats of integrated circuits and electronic devices
5. Use metrics to measure and assess the security level of security mechanisms or primitives in hardware security applications
6. Analyze and assess potential security vulnerabilities in hardware and embedded systems
7. Learn state-of-art security mechanisms and research topics in the hardware and embedded security area

E E 460. Space System Mission Design and Analysis**3 Credits (3)**

Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems. Students must be in junior standing to enroll.

Learning Outcomes

1. Apply knowledge from science, math and engineering to satellite design.
2. Experience the "system engineering" of satellite design through the design of a space mission.
3. Understand the professional and ethical responsibilities related to satellite design.
4. Understand the impact of satellite related engineering solutions in a global, economic, environmental, and societal context.
5. Maintain a knowledge of contemporary professional, societal and global issues as they relate to satellites.

E E 462. Computer Systems Architecture**3 Credits (3)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Taught with E E 562.

Prerequisite: C- or better in E E 362.

Learning Outcomes

1. Recognize the basic principles and current practices of computer architectures of processors, memory systems, interconnects, and input/output systems
2. Reason about the issues that influence the architectures of processors, memory systems, interconnects, and input/output systems
3. Evaluate and improve computer system performance through analysis and computer simulation
4. Solve and implement a small research problem in computer architecture.

E E 465. Machine Learning I**3 Credits (3)**

An undergraduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Taught with E E 565.

Prerequisite: C- or better in E E 200.

Learning Outcomes

1. Formulate and solve problems related to the basic concepts and mathematical techniques of machine learning.
2. Gain an understanding of machine learning algorithms/methods by solving problems using software.
3. Gain experience doing independent study and research.
4. Formulate and solve problems related to the basics of regression, classification, and unsupervised learning.
5. Gain practical experience through project-based assignments and technical report writing.

E E 467. ARM SOC Design**3 Credits (3)**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Taught with E E 567.

Prerequisite: C- or better in E E 362 and E E 317.

Learning Outcomes

1. Formulate and solve problems requiring knowledge and understanding of ARM processor architectures and ARM-based SoCs
2. Capture the design of ARM-based SoCs in a standard hardware description language
3. Conduct low-level software design for ARM-based SoCs and high-level application development
4. Demonstrate the ability to use and choose between different techniques for digital system design and capture;
5. Evaluate implementation results (e.g. speed, area, power) and correlate them with the corresponding high level design and capture;
6. Demonstrate the ability to use a commercial tools to develop ARM-based SoCs

E E 473. Introduction to Optics**3 Credits (3)**

The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Crosslisted with: PHYS 473.

Prerequisite(s): C- or better in PHYS 1320G or PHYS 2120.

E E 475. Control Systems Synthesis**3 Credits (3)**

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Taught with E E 551.

Prerequisite: C- or better in E E 407.

Learning Outcomes

1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of a auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain)
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity)
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation)
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations)

E E 476. Computer Control Systems**3 Credits (3)**

Representation, analysis and design of discrete-time systems using time-domain and z-domain techniques. Microprocessor control systems.

Prerequisite(s): C- or better in E E 325.

E E 478. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 528. Recommended foundation: E E 473 /PHYS 473.

Prerequisite: C- or better in PHYS 1320G or PHYS 2120.

Learning Outcomes

1. Understand the fundamentals of the different theories of light including ray, wave, electromagnetic (vector) and photon optics, and how these theories are represented mathematically and on a computer.
2. Develop the ability to perform calculations for the different theories (e.g., ray tracing, wave interference, polarization calculus, photon detection) to determine the propagation characteristics and describe the manipulation of light.
3. Gain insight and experience with materials and devices for manipulating and detecting light (e.g., glass, mirrors, lenses, fiber optics, polarization elements, liquid crystals, semiconductors, and photodiodes).
4. Apply the theoretical, mathematical, and practical understanding of optics to describe real-world applications of light technology with supporting analysis and calculations.

E E 479. Lasers and Applications**4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Taught with E E 529. Crosslisted with: PHYS 479.

Prerequisite(s): C- or better in E E 340 or in PHYS 461.

E E 480. Introduction to Analog and Digital VLSI**3 Credits (3)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Taught with E E 510.

Prerequisite: C- or better in E E 362 and E E 317.

Learning Outcomes

1. Explain the basic concepts of CMOS VLSI system design
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions
3. Use modern software tools to simulate integrated circuits
4. Formulate and solve problems related to operation and design of basic analog building blocks
5. Formulate and solve problems related to operation and design of basic digital building blocks
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area..) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 482. Electronics II**3 Credits (3)**

Feedback analysis, application of operational amplifiers, introduction to data converters, analog filters, and oscillator circuits.

Prerequisite(s): C- or better in E E 317.

E E 485. Analog VLSI Design**3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523.

Prerequisite: C- or better in E E 320 and E E 480.

Learning Outcomes

1. Analysis, design, simulation, and layout of current mirrors, current sources, and voltage references
2. Analysis, design, simulation, and layout of differential and operational amplifiers
3. Analysis, design, simulation, and layout of switched-capacitor circuits
4. Using VLSI CAD tools for simulating and laying out analog integrated circuits
5. Writing laboratory reports and project documentation

E E 490. Selected Topics**1-3 Credits**

May be repeated for a maximum of 9 credits. Graduate students may not use credits of E E 490 toward an M.S. or Ph.D. in electrical engineering.

Prerequisite: consent of instructor.

E E 493. Power Systems III**3 Credits (3)**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543.

Prerequisite: C- or better in E E 431.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 496. Introduction to Communication Systems**3 Credits (3)**

Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems.

Prerequisite(s): C- or better in E E 325.

E E 497. Digital Communication Systems I**3 Credits (3)**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 496. Taught with: E E 581.

Prerequisite: C- or better in E E 200 and E E 325.

Learning Outcomes

1. Analyze bandwidth and error performance of baseband and bandpass signals through mathematical explanations and simulated experimental data.
2. Evaluate channel code structures and their performance.
3. Analyze communication system issues involving link budgets, synchronization and resource allocations.
4. Develop a wider perspective recognizing contemporary technologies, impact of the solutions and professional and ethical responsibilities.

E E 501. Research Topics in Electrical and Computer Engineering**1 Credit (1)**

Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering.

E E 502. Electricity Markets**3 Credits (3)**

Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Recommended foundation: E E 431. Taught with: E E 405.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 506. Quantum Computing**3 Credits (3)**

This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught concurrently with E E 406.

Learning Outcomes

1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 510. Introduction to Analog and Digital VLSI**3 Credits (3)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process.

Recommended foundation: E E 362 and E E 317 Taught with E E 480.

Learning Outcomes

1. Explain the basic concepts of CMOS VLSI system design
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions
3. Use modern software tools to simulate integrated circuits
4. Formulate and solve problems related to operation and design of basic analog building blocks
5. Formulate and solve problems related to operation and design of basic digital building blocks
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area..) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 512. ASIC Design**3 Credits (3)**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Recommended foundation: E E 480. Taught with E E 412.

Learning Outcomes

1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padding, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 515. Electromagnetic Theory I**3 Credits (3)**

Electromagnetic theory of time-harmonic fields in rectangular, cylindrical and spherical coordinates with applications to guided waves and radiated waves. Induction and equivalence theorems, perturbational and variational principles applied to engineering problems in electromagnetics. Recommended foundation: E E 340.

E E 516. Electromagnetic Theory II**3 Credits (3)**

Continuation of E E 515.

E E 521. Microwave Engineering**3 Credits (3)**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components.

Microwave network analysis and active device design. Recommended foundation: E E 340. Taught with: E E 453.

E E 523. Analog VLSI Design**3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended foundation: E E 320 and E E 480. Crosslisted with: E E 485.

E E 528. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 478. Crosslisted with: PHYS 528.

Prerequisite: (PHYS 1320G or PHYS 2120) and E E 473/PHYS 473.

Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

E E 529. Lasers and Applications**4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Recommended foundation: E E 351 or PHYS 461. Taught with: E E 479 with differentiated assignments for graduate students. Crosslisted with: PHYS 529

E E 534. Power System Relaying**3 Credits (3)**

Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended foundation: E E 493.

E E 537. Power Electronics**3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended foundation: E E 317 and E E 333. Taught with: E E 432.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 540. Photovoltaic Devices and Systems**3 Credits (3)**

Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Recommended foundation: E E 317. Taught with: E E 440.

Learning Outcomes

1. Name at least three different types of photovoltaic materials and cells.
2. Derive equations governing operation of photovoltaic cells.
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity.
4. Describe principles of operation of the “balance of the system” (BOS) components of the photovoltaic system.

E E 541. Antennas and Radiation**4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended foundation is E E 340. Taught with E E 454.

Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 542. Power Systems II**3 Credits (3)**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended foundation: E E 333. Taught with E E 431.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 543. Power Systems III**3 Credits (3)**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended foundation: E E 431. Taught with: E E 493.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 544. Distribution Systems**3 Credits (3)**

Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended foundation: E E 542 and E E 543.

E E 545. Digital Signal Processing II**3 Credits (3)**

Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended foundation: E E 395.

E E 548. Introduction to Radar**3 Credits (3)**

Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended foundation: E E 200, E E 340 and E E 496. Taught with: E E 452.

E E 549. Smart Antennas**3 Credits (3)**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Recommended foundation: E E 325 and E E 340. Crosslisted with: E E 449.

E E 551. Control Systems Synthesis**3 Credits (3)**

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Recommended foundation: E E 407 Intro to Control Systems or equivalent. Taught with E E 475.

Learning Outcomes

1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of a auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain)
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity)
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation)
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations)

E E 556. Hardware & Software Codesign**3 Credits (3)**

This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Taught with E E 409.

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.
2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Describe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado
6. Experience working in translation between C code and HDL for practical problems and verify/test the solution on FPGA SoC architecture

E E 558. Hardware Security and Trust**3 Credits (3)**

This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Recommended foundation: E E 212. Crosslisted with: E E 458.

E E 562. Computer Systems Architecture**3 Credits (3)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended foundation is E E 212. Taught with: E E 462.

E E 563. Computer Performance Analysis I**3 Credits (3)**

Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 200 and E E 462.

E E 564. Architectural Concepts II**3 Credits (3)**

Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474. Crosslisted with: C S 573.

Learning Outcomes

1. Be able to explain the features in a modern multicore CPU architecture
2. Be able to utilize hardware counter features of a CPU in performance evaluation
3. Be able to explain the architecture of GPUs and their capabilities and drawbacks
4. Be able to evaluate novel cutting-edge architectural features and designs
5. Be able to present a research paper to an advanced audience

E E 565. Machine Learning I**3 Credits (3)**

A graduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Recommended foundation: E E 571 and MATH 480. Taught with: E E 465.

E E 567. ARM SOC Design**3 Credits (3)**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages.

Recommended foundation is E E 212 and E E 317. Crosslisted with: E E 467.

E E 571. Random Signal Analysis**3 Credits (3)**

Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems.

E E 572. Modern Coding Theory**3 Credits (3)**

Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation: E E 200 and E E 496.

E E 573. Signal Compression**3 Credits (3)**

Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Taught with E E 448.

Learning Outcomes

1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/sampling

E E 576. Geometric Algebra**3 Credits (3)**

Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Taught with E E 403.

Learning Outcomes

1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 577. Fourier Methods in Electro-Optics**3 Credits (3)**

Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 320 and E E 528. Crosslisted with: PHYS 577.

E E 578. Optical System Design**3 Credits (3)**

Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E/PHYS 473, E E/PHYS 528 and E E/PHYS 577. Crosslisted with: PHYS 578.

E E 581. Digital Communication Systems I**3 Credits (3)**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 200, E E 325, and E E 496. Crosslisted with: E E 497.

E E 583. Wireless Communication**3 Credits (3)**

Cellular networks, wireless channels and channel models, modulation and demodulation, MIMO, diversity and multiplexing, OFDM, wireless standards including LTE and WiMAX. Recommended foundation: E E 571 and E E 325.

E E 585. Telemetry Systems**3 Credits (3)**

Covers the integration of components into a command and telemetry system. Topics include analog and digital modulation formats, synchronization, link effects, and applicable standards. Recommended foundation: E E 395, E E 496, and E E 497.

E E 586. Information Theory**3 Credits (3)**

This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Restricted to: Main campus only. Crosslisted with: MATH 509

Prerequisite(s): E E 571 or MATH 515.

E E 588. Advanced Image Processing**3 Credits (3)**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with: E E 444.

Prerequisite: E E 446 or E E 596.

E E 590. Selected Topics**1-9 Credits**

May be repeated for a maximum of 18 credits.

E E 593. Mobile Application Development**3 Credits (3)**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. Recommended foundation: C S 451 or C S 452. Taught with: E E 443.

E E 596. Digital Image Processing**3 Credits (3)**

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Crosslisted with: E E 446.

E E 597. Neural Signal Processing**3 Credits (3)**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Crosslisted with: E E 447.

E E 598. Master's Technical Report**1-9 Credits (1-9)**

Individual investigation, either analytical or experimental, culminating in a technical report. Graded PR/S/U. May be repeated up to 18 credits. Thesis/Dissertation Grading.

E E 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits. Thesis/Dissertation Grading.

E E 600. Doctoral Research**1-15 Credits**

Research.

E E 615. Computational Electromagnetics**3 Credits (3)**

The numerical solution of electromagnetics problems. Topics include differential equation techniques, integral equation methods, hybrid techniques, algorithm development and implementation, and error analysis. Particular algorithms, including FEM, finite differences, direct solvers, and iterative solvers, are studied.

E E 690. Selected Topics**1-9 Credits**

May be repeated for a maximum of 9 credits.

E E 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. May be repeated up to 88 credits. Thesis/Dissertation Grading.

Name: The Klipsch School of Electrical and Computer Engineering

Office Location: Thomas and Brown Hall, Rm 106

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Las Cruces, NM 88003

Phone: (575) 646-3115

Website: <http://ece.nmsu.edu/> (<http://ece.nmsu.edu/>)

Electrical Engineering - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular option of the B.S. EE program

has "no concentration," giving students the greatest flexibility in course selection.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-125 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i> ¹		3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World		
Viewing a Wider World Electives ³		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
STEM		
Choose three STEM Electives ⁴		9
<i>Electrical and Computer Engineering</i>		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4

ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
<i>E E Concentration Courses</i> ³		
Choose three courses, from three of the five different concentrations, from the following:		9-10
Communications & Signal Processing:		
E E 395 or E E 496	Introduction to Digital Signal Processing Introduction to Communication Systems	
Computers & Microelectronics:		
E E 462 or E E 480	Computer Systems Architecture Introduction to Analog and Digital VLSI	
Control & Power:		
E E 431 or E E 475	Power Systems II Control Systems Synthesis	
Electromagnetics & Photonics:		
E E 473 or E E 454	Introduction to Optics Antennas and Radiation	
Space Systems:		
E E 460	Space System Mission Design and Analysis	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Programming Elective</i>		
Select one course from the following (3 or 4 cr):		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 121		0
Total Credits		123-125

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16

Spring

MATH 1511G	Calculus and Analytic Geometry I	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15

Second Year

Fall		Credits
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16

Spring

MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
E E 240	Multivariate and Vector Calculus Applications	3
Credits		16-17

Third Year

Fall		Credits
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15

Spring

E E 317	Semiconductor Devices and Electronics I	4
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E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3

Credits **15**

Fourth Year

Fall

ENGR 401	Engineering Capstone I	3
Between zero and three E E Concentration Courses from the following: ^{3,4}		0-9
E E 395 or E E 496	Introduction to Digital Signal Processing or Introduction to Communication Systems	
E E 462 or E E 480	Computer Systems Architecture or Introduction to Analog and Digital VLSI	
E E 431 or E E 475	Power Systems II or Control Systems Synthesis	
Between zero and three STEM Electives ^{4,5}		9-0
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,4}		3

Credits **15**

Spring

ENGR 402	Engineering Capstone II	3
Between zero and three E E Concentration Course from one of the following: ^{3,4}		0-10
E E 454 or E E 473	Antennas and Radiation or Introduction to Optics	
E E 460	Space System Mission Design and Analysis	
Between zero and three STEM Electives ^{4,5}		9-0
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,4}		3
Credits		15-16
Total Credits		123-125

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education and Viewing a Wider World (p. 220) section of the catalog for a full list of courses.

³ Students must choose one course from three different concentration areas:

- Communications & Signal Processing: E E 395 Introduction to Digital Signal Processing or E E 496 Introduction to Communication Systems
- Computers & Microelectronics: E E 462 Computer Systems Architecture or E E 480 Introduction to Analog and Digital VLSI
- Control & Power: E E 431 Power Systems II or E E 475 Control Systems Synthesis
- Electromagnetics & Photonics: E E 454 Antennas and Radiation or E E 473 Introduction to Optics
- Space Systems: E E 460 Space System Mission Design and Analysis

⁴ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

⁵ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view

a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **communications and signal processing**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-125 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2¹</i>		
<i>Oral Communications¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	11
PHYS 1310G & PHYS 1310L	Calculus-Based Physics I and Calculus-Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits)¹</i>		
<i>Area V: Humanities¹</i>		
<i>Area VI: Creative and Fine Arts¹</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World		
Viewing a Wider World Electives ³		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		

Mathematics and Natural Science

MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus-Based Physics II and Calculus-Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3

STEM

Choose two STEM Electives ⁴	6
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Electrical and Computer Engineering

ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3

E E Concentration Required Courses

E E 395	Introduction to Digital Signal Processing	3
E E 496	Introduction to Communication Systems	3

E E Concentration Electives: Choose two courses from the following (one must be an E E course):

E E 444	Advanced Image Processing
E E 446	Digital Image Processing
E E 447	Neural Signal Processing
E E 460	Space System Mission Design and Analysis
E E 465	Machine Learning I
E E 490	Selected Topics (Wireless Communications)
E E 497	Digital Communication Systems I
C S 343	Algorithm Design & Implementation
C S 372	Data Structures and Algorithms
C S 453	Python Programming I ⁵
C S 475	Artificial Intelligence I
C S 476	Computer Graphics I
C S 477	Digital Game Design
C S 478	Computer Security
C S 486	Bioinformatics
MATH 471	Complex Variables
MATH 472	Fourier Series and Boundary Value Problems
MATH 473	Calculus of Variations and Optimal Control
MATH 480	Applied Linear Algebra
MATH 481	Advanced Linear Algebra
MATH 491	Introduction to Real Analysis I
STAT 470	Probability: Theory and Applications

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

Programming Elective

Select one course from the following: 3-4

C S 151	C++ Programming
C S 152	Java Programming
C S 153	Python Programming I ⁵

C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		0
Total Credits		123-125

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

⁵ Students may take C S 153 Python Programming I toward their Programming Elective or C S 453 Python Programming I toward their E E Concentration Electives, but not both.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16
Spring		
MATH 1511G	Calculus and Analytic Geometry I ¹	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15
Second Year		
Fall		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16

Spring		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		16-17

Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15

Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15

Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 395	Introduction to Digital Signal Processing ³	3
E E 496	Introduction to Communication Systems ³	3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V or VWW) ^{2,5}		3
Credits		15

Spring		
ENGR 402	Engineering Capstone II	3
Communications & Signal Processing Elective ^{5,6}		3-4
Communications & Signal Processing Elective ^{5,6}		3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V or VWW) ^{2,5}		3
Credits		15-16
Total Credits		123-125

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

² See the General Education and Viewing a Wider World (p. 220) section of the catalog for a full list of courses.

³ Students must take both E E 395 Introduction to Digital Signal Processing and E E 496 Introduction to Communication Systems, both of which are offered in the Fall semester.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view

a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

- ⁵ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
- ⁶ One Communications & Signal Processing Elective Courses must be from the E E Prefix. Communications & Signal Processing Elective Courses:
- E E 444 Advanced Image Processing, E E 446 Digital Image Processing, E E 447 Neural Signal Processing, E E 460 Space System Mission Design and Analysis, E E 465 Machine Learning I, E E 490 Wireless Communications, E E 497 Digital Communication Systems I
 - C S 343 Algorithm Design & Implementation, C S 372 Data Structures and Algorithms, C S 453 Python Programming I, C S 475 Artificial Intelligence I, C S 476 Computer Graphics I, C S 477 Digital Game Design, C S 478 Computer Security, C S 486 Bioinformatics
 - MATH 471 Complex Variables, MATH 472 Fourier Series and Boundary Value Problems, MATH 473 Calculus of Variations and Optimal Control, MATH 480 Applied Linear Algebra, MATH 481 Advanced Linear Algebra, MATH 491 Introduction to Real Analysis I
 - STAT 470 Probability: Theory and Applications

Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **computers and microelectronics**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-125 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		

English Composition - Level 1

ENGL 1110G	Composition I	4
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<i>English Composition - Level 2</i> ¹		3
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<i>Oral Communication</i> ¹		3
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Area II: Mathematics

MATH 1511G	Calculus and Analytic Geometry I ²	4
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<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
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CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
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PHYS 1310G & PHYS 1310L	Calculus-Based Physics I and Calculus-Based Physics I Lab	
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<i>Area IV: Social/Behavioral Sciences (3 credits)</i> ¹		
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<i>Area V: Humanities</i> ¹		3
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<i>Area VI: Creative and Fine Arts</i> ¹		3
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<i>General Education Elective</i> ¹		
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MATH 1521G	Calculus and Analytic Geometry II	4
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Viewing A Wider World

<i>Viewing a Wider World Electives</i> ³		6
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Departmental/College Requirements

Program Specific Requirements

Mathematics and Natural Science

MATH 392	Introduction to Ordinary Differential Equations	3
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PHYS 1320G & PHYS 1320L	Calculus-Based Physics II and Calculus-Based Physics II Lab	4
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ENGR 190	Introduction to Engineering Mathematics	4
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E E 200	Linear Algebra, Probability and Statistics Applications	4
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E E 240	Multivariate and Vector Calculus Applications	3
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STEM

<i>Choose two STEM electives</i> ⁴		6
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Electrical and Computer Engineering

ENGR 120	DC Circuit Analysis	4
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ENGR 130	Digital Logic	4
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ENGR 140	Introduction to Programming and Embedded Systems	4
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ENGR 230	AC Circuit Analysis	4
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E E 300	Cornerstone Design	2
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E E 317	Semiconductor Devices and Electronics I	4
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E E 320	Signals and Systems I	3
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E E 325	Signals and Systems II	4
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E E 340	Fields and Waves	4
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E E 362	Introduction to Computer Organization	4
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ENGR 401	Engineering Capstone I	3
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ENGR 402	Engineering Capstone II	3
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E E Concentration Required Courses

E E 462	Computer Systems Architecture	3
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E E 480	Introduction to Analog and Digital VLSI	3
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<i>E E Concentration Electives: Choose two courses from the following (one must be an E E course):</i>		6-7
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E E 412	ASIC Design	
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E E 432	Power Electronics	
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E E 443	Mobile Application Development	
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E E 458	Hardware Security and Trust	
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E E 467	ARM SOC Design	
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E E 482	Electronics II	
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E E 485	Analog VLSI Design	
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E E 490	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
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CHME 467	Nanoscience and Nanotechnology	
C S 343	Algorithm Design & Implementation	
C S 370	Compilers and Automata Theory	
C S 371	Software Development	
C S 372	Data Structures and Algorithms	
C S 474	Operating Systems I	
C S 478	Computer Security	
C S 482	Database Management Systems I	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Programming Elective</i>		
Select one course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Elective, to bring the total credits to 124		0
Total Credits		123-125

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16
Spring		
MATH 1511G	Calculus and Analytic Geometry I ¹	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4

ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15
Second Year		
Fall		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16
Spring		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Credits		16-17
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 462	Computer Systems Architecture ³	3
E E 480	Introduction to Analog and Digital VLSI ³	3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3
Credits		15
Spring		
ENGR 402	Engineering Capstone II	3
Computers & Microelectronics Elective ^{5,6}		3-4
Computers & Microelectronics Elective ^{5,6}		3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3
Credits		15-16
Total Credits		123-125

- ¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
- ² See the General Education and Viewing a Wider World (p. 220) section of the catalog for a full list of courses.
- ³ Students must take both E E 462 Computer Systems Architecture and E E 480 Introduction to Analog and Digital VLSI, both of which are offered in the Fall semester.
- ⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).
- ⁵ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
- ⁶ One Computers & Microelectronics Elective Courses must be from the E E Prefix. Computers & Microelectronics Elective Courses:
- E E 412 ASIC Design, E E 432 Power Electronics, E E 443 Mobile Application Development, E E 458 Hardware Security and Trust, E E 467 ARM SOC Design, E E 482 Electronics II, E E 485 Analog VLSI Design, E E 490 Selected Topics Applications of Parallel Computing XSEDE Collaborative Course
 - CHME 467 Nanoscience and Nanotechnology
 - C S 343 Algorithm Design & Implementation, C S 370 Compilers and Automata Theory, C S 371 Software Development, C S 372 Data Structures and Algorithms, C S 474 Operating Systems I, C S 478 Computer Security, C S 482 Database Management Systems I

Electrical Engineering (Control & Power) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **control and power systems**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-124 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48

credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2 ¹</i>		3
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits) ¹</i>		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World ³		
Viewing a Wider World Electives		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
<i>STEM</i>		
Choose two STEM Electives ⁴		6
<i>Electrical and Computer Engineering</i>		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
<i>E E Concentration Required Courses</i>		
E E 431	Power Systems II	3
E E 475	Control Systems Synthesis	3
<i>E E Concentration Electives: Choose two courses from the following (one must be an E E course):</i>		6
E E 432	Power Electronics	

E E 440	Photovoltaic Devices and Systems	
E E 476	Computer Control Systems	
E E 493	Power Systems III	
C S 343	Algorithm Design & Implementation	
CHME 361	Engineering Materials	
M E 481	Alternative and Renewable Energy	
M E 487	Mechatronics	
MATH 480	Applied Linear Algebra	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Programming Elective</i>		
Select one course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		0
Total Credits		123-124

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16
Spring		
MATH 1511G	Calculus and Analytic Geometry I	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4

ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15
Second Year		
Fall		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16
Spring		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		16-17
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 431	Power Systems II ³	3
E E 475	Control Systems Synthesis ³	3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3
Credits		15
Spring		
ENGR 402	Engineering Capstone II	3
Control & Power Elective ^{5,6}		3
Control & Power Elective ^{5,6}		3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3
Credits		15
Total Credits		123-124

- ¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
- ² See the General Education and Viewing a Wider World (p. 220) section of the catalog for a full list of courses.
- ³ Students must take both E E 431 Power Systems II and E E 475 Control Systems Synthesis, both of which are offered in the Fall semester.
- ⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).
- ⁵ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
- ⁶ One Control & Power Elective Courses must be from the E E Prefix. Control & Power Elective Courses:
- E E 432 Power Electronics, E E 440 Photovoltaic Devices and Systems, E E 476 Computer Control Systems, E E 493 Power Systems III
 - C S 343 Algorithm Design & Implementation, C S 483
 - CHME 361 Engineering Materials
 - M E 481 Alternative and Renewable Energy, M E 487 Mechatronics
 - MATH 480 Applied Linear Algebra

Electrical Engineering (Controls & Robotics) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (BSEE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the BSEE program gives students the opportunity to explore more deeply the area of **controls and robotics**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-124 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

BSEE students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. A student may attempt any of these courses no more than three times to earn a passing grade of C- or better. Students who earn a grade less than a C- will be contacted by the department head or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to pass any of these courses after three attempts, then the student will not be able to continue as an electrical engineering major and will be counseled on other degree options. Students may request an exception to this policy through written appeal to the Associate Dean for Academics in the College of Engineering.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2 ¹</i>		3
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits) ¹</i>		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World ³		6
<i>Viewing a Wider World Electives</i>		
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
STEM		6
Choose two STEM Electives ⁴		
<i>Electrical and Computer Engineering</i>		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4

E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I ⁵	3
ENGR 402	Engineering Capstone II	3
E E Concentration Required Courses		
E E 407	Introduction to Control Systems ⁶	3
E E 475	Control Systems Synthesis ⁶	3
E E Concentration Electives: Choose two courses from the following (one must be an E E course): ⁷		6
E E 395	Introduction to Digital Signal Processing	
E E 403	Geometric Algebra	
E E 444	Advanced Image Processing	
E E 446	Digital Image Processing	
E E 460	Space System Mission Design and Analysis	
E E 465	Machine Learning I	
E E 476	Computer Control Systems	
E E 496	Introduction to Communication Systems	
M E 234	Mechanics-Dynamics	
M E 452	Control System Design	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
C S 453	Python Programming I ^{8,9}	
C S 475	Artificial Intelligence I	
C S 484	Computer Networks I	
MATH 473	Calculus of Variations and Optimal Control	
MATH 480	Applied Linear Algebra	
MATH 481	Advanced Linear Algebra	
MATH 491	Introduction to Real Analysis I	
STAT 470	Probability: Theory and Applications	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Programming Elective		
Select one course from the following:		3-4
C S 151	C++ Programming ⁹	
or C S 451	C++ Programming	
C S 152	Java Programming ⁹	
or C S 452	Java Programming	
C S 153	Python Programming I ⁹	
or C S 453	Python Programming I	
C S 154	Python Programming II ⁹	
or C S 454	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		0
Total Credits		123-124

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view

a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

⁵ The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.

⁶ Students must take both E E 407 Introduction to Control Systems which is offered in the Fall semester and E E 475 Control Systems Synthesis which is offered in the Spring semester. Note also that E E 407 Introduction to Control Systems is a prerequisite for E E 475 Control Systems Synthesis.

⁷ Some of these elective courses may have additional prerequisites.

⁸ Students may count C S 453 Python Programming I toward their Programming Elective **or** toward their E E Concentration Electives, but may not use the course to count toward both.

⁹ Only one of the 100-level or the 400-level course may be taken to satisfy degree requirements. Students may not take the 100-level of a course to satisfy the programming elective requirement and the 400-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16

Spring

MATH 1511G	Calculus and Analytic Geometry I	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15

Second Year

Fall		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16

Spring

MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
C S 151 or C S 451	C++ Programming or C++ Programming	

C S 152 or C S 452	Java Programming or Java Programming	
C S 153 or C S 453	Python Programming I or Python Programming I	
C S 154 or C S 454	Python Programming II or Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		16-17
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 407	Introduction to Control Systems ³	3
Controls & Robotics Elective ^{5,6}		3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3
Credits		15
Spring		
ENGR 402	Engineering Capstone II	3
E E 475	Control Systems Synthesis	3
Controls & Robotics Elective ^{5,6}		3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,5}		3
Credits		15
Total Credits		123-124

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

² See the General Education and Viewing a Wider World (p. 220) section of the catalog for a full list of courses.

³ Students must take both E E 407 Introduction to Control Systems which is offered in the Fall semester and E E 475 Control Systems Synthesis which is offered in the Spring semester. Note also that E E 407 Introduction to Control Systems is a prerequisite for E E 475 Control Systems Synthesis.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

⁵ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

⁶ At least one Controls & Robotics Elective must be from the E E prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **electromagnetics and photonics**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (124-127 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2 ¹</i>		3
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus-Based Physics I and Calculus-Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits) ¹</i>		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective</i>		

MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World		
Viewing a Wider World Electives ³		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
<i>STEM</i>		
Choose two STEM Electives ⁴		6
<i>Electrical and Computer Engineering</i>		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
<i>E E Concentration Required Courses</i>		
E E 454	Antennas and Radiation	4
E E 473	Introduction to Optics	3
E E Concentration Electives: Choose two courses from the following (one must be an E E course):		6-8
E E 449	Smart Antennas	
E E 452	Introduction to Radar	
E E 453	Microwave Engineering	
E E 478	Fundamentals of Photonics	
E E 479	Lasers and Applications	
CHME 467	Nanoscience and Nanotechnology	
M E 328	Engineering Analysis II	
ASTR 402	Astronomical Observations and Techniques	
MATH 471	Complex Variables	
MATH 472	Fourier Series and Boundary Value Problems	
MATH 480	Applied Linear Algebra	
PHYS 315	Modern Physics	
PHYS 471	Modern Experimental Optics	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Programming Elective</i>		
Select one course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		

Electives, to bring the total credits to 122	0
Total Credits	124-127

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses.
- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
- ³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16

Spring

MATH 1511G	Calculus and Analytic Geometry I	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15

Second Year

Fall

MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16

Spring

MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	

C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
E E 240	Multivariate and Vector Calculus Applications	3
Credits		16-17

Third Year

Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15

Spring

E E 325	Signals and Systems II	4
E E 317	Semiconductor Devices and Electronics I	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15

Fourth Year

Fall		
ENGR 401	Engineering Capstone I	3
Electromagnetics & Photonics Elective ^{3,4}		3-4
Electromagnetics & Photonics Elective ^{3,4}		3-4
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,4}		3
STEM Elective ^{4,5}		3
Credits		15-17

Spring

ENGR 402	Engineering Capstone II	3
E E 473	Introduction to Optics ⁶	3
E E 454	Antennas and Radiation ⁶	4
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,4}		3
Credits		16
Total Credits		124-127

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

² See the General Education and Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

³ One Electromagnetics & Photonics Elective Courses must be from the E E Prefix. Electromagnetics & Photonics Elective Courses:

- ASTR 402 Astronomical Observations and Techniques
- E E 449 Smart Antennas, E E 452 Introduction to Radar, E E 453 Microwave Engineering, E E 478 Fundamentals of PhotonicsE E 479 Lasers and Applications
- CHME 467 Nanoscience and Nanotechnology
- M E 328 Engineering Analysis II
- MATH 471 Complex Variables, MATH 472 Fourier Series and Boundary Value Problems, MATH 480 Applied Linear Algebra
- PHYS 315 Modern Physics, PHYS 471 Modern Experimental Optics

⁴ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM

electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

⁵ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

⁶ Students must take both E E 454 Antennas and Radiation and E E 473 Introduction to Optics, both of which are offered in the Spring semester.

Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering (B.S. EE) program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **space systems**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Requirements (123-126 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2 ¹</i>		3
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences (3 credits) ¹</i>		
<i>Area V: Humanities ¹</i>		3

<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World		
Viewing a Wider World Electives ³		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics and Natural Science</i>		
MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGR 190	Introduction to Engineering Mathematics	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
<i>STEM</i>		
Choose two STEM Electives ⁴		6
<i>Electrical and Computer Engineering</i>		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
<i>E E Concentration Required Courses</i>		
E E 460	Space System Mission Design and Analysis	3
ASTR 402	Astronomical Observations and Techniques	3
<i>E E Concentration Electives: Choose two courses from the following (one must be an E E course):</i>		6-8
E E 395	Introduction to Digital Signal Processing	
E E 454	Antennas and Radiation	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
E E 496	Introduction to Communication Systems	
A E 362	Orbital Mechanics	
ASTR 401	Topics in Modern Astrophysics	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
<i>Programming Elective</i>		
Select one course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	
C S 172	Computer Science I	
C S 271	Object Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		0
Total Credits		123-126

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G	Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
Credits		16

Spring

MATH 1511G	Calculus and Analytic Geometry I	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
Credits		15

Second Year

Fall		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
Credits		16

Spring

MATH 392	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Choose one Programming course from the following:		3-4
C S 151	C++ Programming	
C S 152	Java Programming	
C S 153	Python Programming I	
C S 154	Python Programming II	

C S 172	Computer Science I	
C S 271	Object Oriented Programming	
E E 240	Multivariate and Vector Calculus Applications	3
Credits		16-17

Third Year**Fall**

E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
General Education Requirement (Area I, IV, V, VI or VWW) ²		3
Credits		15

Spring

E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V or VWW) ²		3
Credits		15

Fourth Year**Fall**

ENGR 401	Engineering Capstone I	3
Space Systems Elective ^{3,4}		3-4
Space Systems Elective ^{3,4}		3-4
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,4}		3
Credits		15-17

Spring

ENGR 402	Engineering Capstone II	3
E E 460	Space System Mission Design and Analysis ⁶	3
ASTR 402	Astronomical Observations and Techniques ⁶	3
STEM Elective ^{4,5}		3
General Education Requirement (Area I, IV, V, VI or VWW) ^{2,4}		3
Credits		15

Total Credits 123-126

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

² See the General Education and Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

³ One Space Systems Elective Course must be from the E E Prefix. Space Systems Elective Courses:

- E E 395 Introduction to Digital Signal Processing, E E 454 Antennas and Radiation, E E 473 Introduction to Optics, E E 478 Fundamentals of Photonics, E E 496 Introduction to Communication Systems
- A E 362 Orbital Mechanics
- ASTR 401 Topics in Modern Astrophysics

⁴ Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed/VWW electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

⁵ STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, C S, MATH, PHYS and STAT. Excluded courses include VWW courses and

those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (<https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html>).

⁶ Students must take both E E 460 Space System Mission Design and Analysis and ASTR 402 Astronomical Observations and Techniques which are both offered in the Spring semester.

Computer Engineering - Undergraduate Minor (26-27 Credits)

Prefix	Title	Credits
Prerequisites (All may be transferred)		
MATH 1511G	Calculus and Analytic Geometry I	4
MATH 1521G	Calculus and Analytic Geometry II	4
Lower Division (all may be transferred)		
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
C S 271	Object Oriented Programming	4
Upper Division (no transfer credits accepted)		
E E 362	Introduction to Computer Organization	4
E E 462	Computer Systems Architecture	3
C S 371	Software Development	4
Computer Engineering Elective (Select one of the following) ¹		3-4
C S 343	Algorithm Design & Implementation	
C S 370	Compilers and Automata Theory	
C S 371	Software Development	
C S 372	Data Structures and Algorithms	
C S 474	Operating Systems I	
C S 478	Computer Security	
C S 482	Database Management Systems I	
E E 490	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
Total Credits		26-27

¹ Some of these electives may have additional prerequisites

Electrical Engineering - Undergraduate Minor (21-24 Credits)

The Electrical Engineering minor is not available to students majoring in Electrical Engineering.

Prefix	Title	Credits
Prerequisites (all may be transferred)		
MATH 1511G	Calculus and Analytic Geometry I	4
MATH 1521G	Calculus and Analytic Geometry II	4
Lower Division (all may be transferred)		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 230	AC Circuit Analysis	4
Upper Division (no transfer credit accepted)		
E E Elective (Select three of the following) ¹		9-12

EE 320	Signals and Systems I
EE 317	Semiconductor Devices and Electronics I
EE 325	Signals and Systems II
EE 333	AC Circuit Analysis and Introduction to Power Systems
EE 340	Fields and Waves
EE 362	Introduction to Computer Organization
EE 412	ASIC Design
EE 431	Power Systems II
EE 432	Power Electronics
EE 443	Mobile Application Development
EE 458	Hardware Security and Trust
EE 460	Space System Mission Design and Analysis
EE 462	Computer Systems Architecture
EE 467	ARM SOC Design
EE 473	Introduction to Optics
EE 480	Introduction to Analog and Digital VLSI
EE 482	Electronics II
Total Credits	
21-24	

¹ Some of the EE Electives have additional pre-requisites

Engineering Physics

Undergraduate Program Information

The Engineering Physics program is offered jointly by the Department of Physics and the College of Engineering. The faculty is drawn from the Departments of Physics, Chemical and Materials Engineering, Electrical and Computer Engineering, and Mechanical & Aerospace Engineering.

The B.S. in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment. The B.S. degree in Engineering Physics is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

The goals of the program are:

1. to give students a strong education in the fundamentals of physics, engineering, applied mathematics and computation;
2. to develop skill in real-world problem solving starting from fundamental physical principles;
3. to improve communication skills; and
4. to develop ability to work in a team.

The student must choose one of four concentrations in

- Aerospace Engineering,
- Chemical Engineering,
- Electrical Engineering, or
- Mechanical Engineering.

Degrees for the Department

- Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics (p. 994)

- Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics (p. 995)
- Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics (p. 997)
- Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics (p. 999)

Professor, Stefan Zollner, Department Head

Professor, Boris Kiefer, Engineering Physics Program Head

Physics Courses

PHYS 1111. Introductory Computational Physics

3 Credits (2+2P)

Introduction to computational techniques for the solution of physics-related problems.

Prerequisite(s): a C- or better in MATH 1220G or MATH 1250G or MATH 1511G.

PHYS 1112. Introductory Physics for the Health Sciences

3 Credits (3)

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

Prerequisite(s): MATH 1215 or Equivalent.

Learning Outcomes

1. The objective of the course is to familiarize the student with the concepts and methods used in the underlying physics associated with various Health Science disciplines.
2. The course will demonstrate how the basic principles of mechanics, thermodynamics, electricity, magnetism, electromagnetic waves and optics can be applied to solve particular problems in Health Sciences applications. Introduces the student to selected topics in modern physics including quantum physics, atomic and nuclear physics.

PHYS 1115G. Survey of Physics with Lab

4 Credits (3+3P)

Overview of the concepts and basic phenomena of physics. This course provides a largely descriptive and qualitative treatment with a minimum use of elementary mathematics to solve problems. No previous knowledge of physics is assumed. Includes laboratory.

Learning Outcomes

1. Apply concepts of classical mechanics (such as velocity, acceleration, force, inertia, momentum, torque, work, energy) to simple static and dynamic systems.
2. Apply concepts of thermodynamics (such as heat, temperature, internal energy, entropy) to simple processes.
3. Apply concepts of electricity and magnetism (such as fields, potential, charge conservation, static and dynamic induction) to simple circuits, motors, and other simple contrivances.
4. Apply simple geometric and wave optics in simple situations.
5. Test ideas using modern laboratory equipment.
6. Estimate experimental uncertainties.
7. Use computers to analyze and report laboratory results.
8. Draw appropriate conclusions from quantitative scientific observations.
9. Accurately and clearly communicate the results of scientific experiments.

PHYS 1125G. Physics of Music**4 Credits (3+2P)**

Introduction for non-science majors to basic concepts, laws, and skills in physics, in the context of a study of sound, acoustics, and music.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply basic classical mechanics to static and dynamic fluids, including Archimedes' principle and Bernoulli's principle.
3. Apply the general properties of waves to simple models of musical instruments.
4. Demonstrate knowledge of basic operating principles of wind, string, and percussion instruments.
5. Demonstrate knowledge of how objectively measurable properties of sound waves correspond to the perceptions of pitch, loudness, and timbre.
6. Demonstrate understanding of the description of vibrations and waves in terms of Fourier's Theorem and normal modes.
7. Demonstrate understanding of vocalization in terms of physical principles such as resonance and fluid dynamics.
8. Demonstrate understanding of how the ear works.

PHYS 1230G. Algebra-Based Physics I**3 Credits (3)**

An algebra-based treatment of Newtonian mechanics. Topics include kinematics and dynamics in one and two dimensions, conservation of energy and momentum, rotational motion, equilibrium, and fluids.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of particles in one and two dimensions.
3. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of a rigid body in two dimensions.
4. Apply Newton's theory of gravitation to circular orbits and demonstrate understanding of how Kepler's laws of planetary motion provide the empirical foundation for Newton's theory.
5. Apply the mathematics of vectors to the principles of Newtonian mechanics.
6. Apply principles of Newtonian mechanics to the case of static and dynamic incompressible fluids, including Archimedes' and Bernoulli's principles.

PHYS 1230L. Algebra-Based Physics I Lab**1 Credit (1)**

A series of laboratory experiments associated with the material presented in PHYS 1230G.

Prerequisite(s)/Corequisite(s): PHYS 1230G.

Learning Outcomes

1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1240G. Algebra-Based Physics II**3 Credits (3)**

The second half of a two semester algebra-based introduction to Physics. This course covers electricity, magnetism and optics.

Prerequisite(s): a C- or better in PHYS 1230G or PHYS 2230G.

Learning Outcomes

1. Be able to state Coulomb's Law and Gauss's laws and apply them.
2. Apply the concepts of electric charge, electric field and electric potential to solve problems.
3. Analyze simple DC and AC circuits.
4. Apply the Lorentz force to solve problems.
5. Apply Faraday's law of induction (and Lenz's law) to solve problems.
6. Apply ray optics to practical lens systems such as microscopes and corrective lenses.
7. Apply the wave nature of light to the phenomena of reflection, refraction, and diffraction.

PHYS 1240L. Algebra-Based Physics II Lab**1 Credit (1)**

A series of laboratory experiments associated with the material presented in PHYS 1240

Prerequisite(s)/Corequisite(s): PHYS 1240G.

Learning Outcomes

1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1310G. Calculus -Based Physics I**3 Credits (3)**

A calculus level treatment of classical mechanics and waves, which is concerned with the physical motion concepts, forces, energy concepts, momentum, rotational motion, angular momentum, gravity, and static equilibrium.

Prerequisite: a C- or better in ENGR 190 or MATH 1511G or higher.

Learning Outcomes

1. Describe the relationships among position, velocity, and acceleration as functions of time.
2. Use the equations of kinematics to describe motion under constant acceleration.
3. Analyze linear motion using Newton's laws, force, and linear momentum.
4. Analyze rotational motion using torque and angular momentum.
5. Analyze motion using work and energy.

PHYS 1310L. Calculus -Based Physics I Lab**1 Credit (3P)**

A series of laboratory experiments associated with the material presented in Calculus-based Physics I. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-based Physics I.

Prerequisite(s)/Corequisite(s): PHYS 1310G.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment.

PHYS 1311. Problems in Calculus-Based Physics I**0.5-1 Credits (.5-1)**

This is a supplemental course for Calculus-based Physics I. May be repeated up to 1 credits.

Corequisite(s): PHYS 1310G.

PHYS 1320G. Calculus -Based Physics II**3 Credits (3)**

A calculus level treatment of classical electricity and magnetism. It is strongly recommended that this course is taken at the same time as Calculus-based Physics II laboratory.

Prerequisite: a C- or better in (PHYS 2110 or PHYS 1310G) and (ENGR 190 or MATH 1521G or higher).

Learning Outcomes

1. Apply the concepts of electric charge, electric field and electric potential to solve problems.
2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge.
3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current.
4. Describe the relationship between electric field and electric potential.
5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles.
6. Apply the integral forms of Maxwell's equations.
7. Calculate the energy of electromagnetic fields.
8. Analyze DC circuits.

PHYS 1320L. Calculus -Based Physics II Lab**1 Credit (3P)**

A series of Laboratory experiments associated with the material presented in Calculus-Based Physics II. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-Based Physics II.

Prerequisite(s)/Corequisite(s): PHYS 1320G. Prerequisite(s): A C- or better in PHYS 2110L or PHYS 1310L.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment

PHYS 1321. Problems in Calculus-Based Physics II**0.5-1 Credits (.5-1)**

This is a supplemental course for Calculus-based Physics II.

Corequisite(s): PHYS 1320G.

PHYS 2110. Mechanics**3 Credits (3)**

Newtonian mechanics.

Prerequisite(s)/Corequisite(s): MATH 1511G or higher.

PHYS 2110L. Experimental Mechanics**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2110. Science majors.

Prerequisite(s)/Corequisite(s): PHYS 2110.

PHYS 2111. Supplemental Instruction to PHYS 2110**1 Credit (1)**

This Optional workshop as a supplement to PHYS 2110. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credit.

Corequisite: PHYS 2110.

Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2110, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2120. Heat, Light, and Sound**3 Credits (3)**

Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound. May be repeated up to 3 credits.

Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.

PHYS 2120L. Heat, Light, and Sound Laboratory**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2120. Science majors.

Prerequisite: a C- or better in PHYS 2110L or PHYS 1310L.

Prerequisite/Corequisite: PHYS 2120.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2121. Supplemental Instruction to PHYS 2120**1 Credit (1)**

This optional workshop supplements PHYS 2120 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 2120 to problem solving and quantitative analysis. May be repeated up to 1 credit.

Corequisite: PHYS 2120.

Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2121, apply quantitative analysis to solve problems involving wave propagation and interference, geometric optics, heat transfer and thermodynamics.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline

PHYS 2140. Electricity and Magnetism**3 Credits (3)**

Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 1521G. Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.

PHYS 2140L. Electricity & Magnetism Laboratory**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2140.

Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G.

Prerequisite/Corequisite: PHYS 2140.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2141. Supplemental Instruction to PHYS 2140**1 Credit (1)**

Optional workshop as a supplement to PHYS 2140. The tutorial sessions focus on reasoning and hands-on problem solving.

Corequisite: PHYS 2140.

Learning Outcomes

1. Analyze real-world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2140, apply quantitative analysis to solve problems, including the use of symmetry to study electric and magnetic fields. Practice concepts of calculus applied to charge and current distributions.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2230G. General Physics for Life Science I**3 Credits (3)**

This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

Prerequisite: A C- or better in MATH 1220G or higher.

Learning Outcomes

1. Modeling: analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain phenomena or function; use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text; critique assumptions and determine how to test the validity of a model and use the comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: describe the motion of any object in terms of displacement, velocity, and acceleration; analyze external forces acting on an object and determine if a system is in equilibrium or relate the net force to changes in motion; predict or analyze motion using conservation laws for energy and momentum; analyze forces and torques for a rigid object in static equilibrium; for a static fluid determine pressure and the buoyant force; apply idealized models of fluid flow to the circulatory system; describe the properties of pressure waves known as sound, apply the model of standing waves to musical instruments and discuss how sound is used to sense the environment; predict qualitative changes in the internal energy of a thermodynamic system when energy has been transferred due to work or heat and justify those predictions using conservation of energy (First law of thermodynamics). Identify which heat transfer processes occur in a described situation.
3. Quantitative reasoning: use a physics problem-solving strategy (Identify relevant concepts; Introduce and study simplified models; Use symmetry arguments; Establish the relation between known and unknown quantities; Calculate a quantitative result using appropriate mathematical methods; Self-check reasonableness of assumptions and solutions); use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2230L. Laboratory to General Physics for Life Science I**1 Credit (1)**

Laboratory experiments in topics associated with material presented in PHYS 2230G.

Prerequisite(s)/Corequisite(s): PHYS 2230G. Restricted to Las Cruces campus only.

PHYS 2231. Supplemental Instruction to General Physics for Life Sciences I**1 Credit (1)**

This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.

Corequisite: PHYS 2230G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2230, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2240G. General Physics for Life Science II**3 Credits (3)**

This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

Prerequisite: a C- or better in PHYS 1230G or PHYS 2230G, and MATH 1220G or higher.

Learning Outcomes

1. Modeling: analyze real world phenomena by constructing simplified idealized models (an abstract description) that allow making predictions or explaining a phenomena or function; use multiple representations to build and communicate the model, including sketches, mathematical expressions, diagrams or graphs; decide what information is relevant and critique assumptions and models of others; determine how to test the validity of a model and use comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: electric or magnetic fields can be used to describe interactions of objects that contain charges with their surroundings; changes that occur as a result of interactions are constrained by conservation laws (such as conservation of energy, conservation of charge or conservation of nucleon number); many macroscopic properties of materials can be described using microscopic models or related to their geometry; electromagnetic radiation can be modeled as a wave or as fundamental particles (photons); the direction of propagation of a wave may change when it encounters a boundary surface between two media of different properties (reflection or refraction); the spontaneous radioactive decay of nuclei is described by probability.
3. Quantitative reasoning: apply quantitative analysis and appropriate mathematical reasoning to describe or explain phenomena; use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations (e.g. field lines, equipotential lines) and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2240L. Laboratory to General Physics for Life Science II**1 Credit (1)**

Laboratory experiments in topics associated with material presented in PHYS 2240.

Prerequisite(s)/Corequisite(s): PHYS 2240G. Restricted to Las Cruces campus only.

PHYS 2241. Supplemental Instruction to General Physics for Life Sciences II**1 Credit (1)**

This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

Corequisite(s): PHYS 2240G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2240, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2996. Special Topics**1-3 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

PHYS 2997. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

PHYS 303V. Energy and Society in the New Millennium**3 Credits (3)**

Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

PHYS 304. Forensic Physics**4 Credits (3+3P)**

Theories, laboratory, and field techniques in the area of forensic physics.

PHYS 305V. The Search for Water in the Solar System**3 Credits (3)**

Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.

PHYS 315. Modern Physics**3 Credits (3)**

An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles.

Prerequisite(s): a C- or better in MATH 2530G and PHYS 2140 or PHYS 1320G.

Learning Outcomes

1. Communication: an ability to communicate effectively with a range of audiences.
2. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 315 L. Experimental Modern Physics**3 Credits (1+6P)**

Elementary laboratory in modern physics which supports the subject matter in PHYS 315. Required for physics majors. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or 1320L.

PHYS 316. Supplemental Instructions to PHYS 315**1 Credit (1)**

This optional workshop supplements PHYS 315 "Modern Physics".

Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.

Corequisite(s): PHYS 315.

PHYS 325. Intermediate Experimental Physics**3 Credits (1+6P)**

An exploration of a variety of experimental techniques in physics with an emphasis on the proper determination of statistical and systematic uncertainties. Students will work in teams and prepare professional written and oral reports of their work. This course cannot be used to replace M E 345 for students majoring in engineering.

Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or PHYS 1320L.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 350. Special Topics**1-3 Credits**

Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

PHYS 380. Individual Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 395. Intermediate Mathematical Methods of Physics**3 Credits (3)**

Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. This course cannot be used to replace M E 228 or M E 328 for students majoring in engineering. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 392. Prerequisite(s): a C- or better in MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 420. Capstone Project I**3 Credits (3P)**

Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

PHYS 421. Capstone Project II**3 Credits (3P)**

Continuation of PHYS 420.

PHYS 450. Selected Topics**1-3 Credits**

Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

PHYS 451. Intermediate Mechanics I**3 Credits (3)**

Newtonian mechanics, including an introduction to the Lagrangian formulation. Topics include central force motion, rigid body motion, noninertial reference frames, oscillating systems, and classical scattering.

Prerequisite(s)/Corequisite(s): MATH 392. **Prerequisite(s):** a C- or better in PHYS 2110 or PHYS 1310G, and MATH 2530G.

Learning Outcomes

1. Set up equations of motion for classical mechanical systems and solve them.
2. Identify conserved quantities and understand the circumstances under which they arise (symmetries); in particular, know how to use conservation of energy, momentum, angular momentum to solve problems.
3. Fluently use three-dimensional calculus as a language to do the above; be able to use spherical and cylindrical coordinates.
4. Understand the paradigmatic examples of the harmonic oscillator, central force (in particular, gravitational) motion and rigid body motion, which serve as starting points for investigating more complicated realistic problems.

PHYS 454. Intermediate Modern Physics I**3 Credits (3)**

Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension.

Prerequisite: a C- or better in PHYS 315.

Prerequisite/Corequisite: MATH 392 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 455. Intermediate Modern Physics II**3 Credits (3)**

Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms.

Prerequisite: a C- or better in PHYS 454, MATH 392, and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 461. Intermediate Electricity and Magnetism I**3 Credits (3)**

The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter.

Prerequisite: a C- or better in PHYS 2140 or PHYS 1320G or equivalent and a C- or better in MATH 2530G.

Prerequisite/Corequisite: MATH 392 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 462. Intermediate Electricity and Magnetism II**3 Credits (3)**

Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics.

Prerequisite: a C- or better in PHYS 461, MATH 392, and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 468. Intermediate X-ray Diffraction**3 Credits (3)**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. **Prerequisite(s):** a C- or better in PHYS 315 and PHYS 325

Learning Outcomes

1. Knowledge of structural properties of materials
2. Experimental x-ray characterization techniques
3. Presentation and writing skills in the discipline
4. Ethics, teamwork, and career opportunities

PHYS 471. Modern Experimental Optics**3 Credits (1+6P)**

Cumulative experience course in experimental optics.

Prerequisite: a C- or better in PHYS 315 and PHYS 325.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 475. Advanced Laboratory Practices for Materials**3 Credits (1+6P)**

Cumulative experience course in advanced laboratory practices involving experiments in atomic, molecular, and condensed matter physics.

Prerequisite: a C- or better in PHYS 315 and (PHYS 315 L or PHYS 325).

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 476. Computational Physics**3 Credits (3)**

Scientific visualization, numerical differentiation and interpolation, numerical integration, root finding, linear algebra, eigensystems, ODE's, Boundary value problems, PDE's, Monte-Carlo calculations, data description and analysis, Fast Fourier Transforms, and applications to advanced physics problems. Recommended is the knowledge of a programming language.

Prerequisite(s): a C- or better in PHYS 1111 or equivalent and MATH 392.

Learning Outcomes

1. learn how to use computers for solving problems in the physical sciences,
2. obtain skills to implement numerical simulation and modeling strategies,
3. learn how to monitor and analyze data graphically, during and after computation,
4. obtain workflow organization skills needed for the solution of complicated systems.

PHYS 480. Thermodynamics**3 Credits (3)**

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases.

Prerequisite: a C- or better in PHYS 2120, PHYS 315, and MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 485. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 488. Introduction to Condensed Matter Physics**3 Credits (3)**

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties.

Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of solid-state physics: classification of solids, crystal structure, band structure of solids, lattice vibrations, optical and magnetic properties of solids.
2. Develop an ability to formulate and solve complex problems in solid state physics by applying the fundamental principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 489. Introduction to Modern Materials**3 Credits (3)**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties.

Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 493. Experimental Nuclear Physics**3 Credits (1+6P)**

Cumulative experience course in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry.

Prerequisite: a C- or better in PHYS 315 and (PHYS 315L or PHYS 325).

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communications: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 495. Mathematical Methods of Physics I**3 Credits (3)**

Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.

Prerequisite(s): a C- or better in MATH 392 and PHYS 395.

Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 500. Special Topics Seminar**1-2 Credits**

Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

PHYS 511. Mathematical Methods of Physics I**3 Credits (3)**

Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.

Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 520. Selected Topics**1-3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: CHME 467. May be repeated up to 3 credits.

Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

PHYS 521. Individual Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

PHYS 528. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 478. Crosslisted with: E E 528.

Prerequisite: (PHYS 1320G or PHYS 2120) and E E 473/PHYS 473.

Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

PHYS 551. Classical Mechanics**3 Credits (3)**

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

PHYS 554. Quantum Mechanics I**3 Credits (3)**

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

PHYS 555. Quantum Mechanics II**3 Credits (3)**

Continuation of topics in PHYS 554.

Prerequisites: PHYS 554 or consent of instructor.

PHYS 561. Electromagnetic Theory I**3 Credits (3)**

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

PHYS 562. Electromagnetic Theory II**3 Credits (3)**

Continuation of topics in PHYS 561.

Prerequisites: PHYS 561 or consent of instructor.

PHYS 568. Elements of X-ray Diffraction**3 Credits (3)**

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

PHYS 571. Advanced Experimental Optics**3 Credits (1+6P)**

Taught with PHYS 471 with additional work required at the graduate level.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 575. Advanced Physics Laboratory**3 Credits (1+6P)**

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 576. Advanced Computational Physics I**3 Credits (3)**

Advanced treatment of topics listed under PHYS 476 plus additional work. Applications of numerical methods to advanced physics problems. Recommended is the knowledge of a programming language.

Learning Outcomes

1. learn to numerically solve problems that require higher mathematical and theoretical analysis,
2. experience how graduate research will be advanced and accelerated by the use of scientific computing skills.

PHYS 584. Statistical Mechanics**3 Credits (3)**

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

PHYS 589. Modern Materials**3 Credits (3)**

Same as PHYS 489 with differentiated assignments for graduate students. PHYS 554 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 591. Advanced High-Energy Physics I**3 Credits (3)**

Taught with PHYS 491 with additional work required at the graduate level.

Prerequisite(s): PHYS 555 or consent of instructor.

PHYS 593. Advanced Experimental Nuclear Physics**3 Credits (1+6P)**

Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 597. Space Plasma Physics**3 Credits (3)**

Same as PHYS 497 but with added requirements.

PHYS 599. Master's Thesis**1-15 Credits (1-15)**

Thesis.

PHYS 600. Research**1-15 Credits**

Doctoral research. May be repeated.

PHYS 620. Advanced Topics in Physics**1-3 Credits**

Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.

Prerequisite: consent of instructor.

PHYS 650. General Relativity I**3 Credits (3)**

Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.

Prerequisite(s): PHYS 511 or PHYS 561 or consent of instructor.

PHYS 680. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: graduate standing or consent of instructor.

PHYS 688. Advanced Condensed Matter Physics**3 Credits (3)**

Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

Learning Outcomes

1. Learn the fundamental concepts of advanced condensed state physics: band theory of solids, electronic structure methods, optical and magnetic properties of solids, bulk semiconductors, and properties of nano-structured materials.
2. Develop an ability to formulate and solve complex problems in advanced condensed matter physics.
3. Develop an ability to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 689. Advanced Modern Materials**3 Credits (3)**

Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. PHYS 555, PHYS 588, and PHYS 589 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystalline, amorphous, polymeric, nanostructured, layered, and composite materials.
2. Develop an ability to formulate and solve complex problems in the area of advanced physics of modern materials.
3. Develop an ability to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 691. Quantum Field Theory I**3 Credits (3)**

Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.

Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.

PHYS 692. Quantum Field Theory II**3 Credits (3)**

QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.

Prerequisite: PHYS 691 or consent of instructor.

PHYS 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation.

Phone: (575) 646-3831

Website: <http://engineeringphysics.nmsu.edu/> (<http://engineeringphysics.nmsu.edu>)

Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics degree program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The B.S. degree in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment. The B.S. degree in Engineering Physics is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

The requirements for the Aerospace concentration is listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i> ¹		3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Select one sequence from the following for four credits:		

PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ³	
Select one sequence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ³	
Area IV: Social and Behavioral Sciences (3 credits) ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Viewing A Wider World		
Viewing a Wider World Electives ⁴		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
<i>Natural Science</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
<i>Physics</i>		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
<i>Physics with Engineering Component</i>		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
<i>Engineering</i>		
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3
A E 424	Aerospace Systems Engineering	3
A E 439	Aerodynamics II	3
A E 447	Aerofluids Laboratory	3
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 121		0
Total Credits		121

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ^{1,2}	4
Area IV: Social and Behavioral Science Course ³		3
Credits		15
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ^{1,2}	4
M E 240	Thermodynamics ¹	3
Credits		15
Second Year		
Semester 1		
MATH 2530G	Calculus III ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4
ENGR 233	Engineering Mechanics I	3
M E 261	Mechanical Engineering Problem Solving ¹	3
ENGL 2210G	Professional & Technical Communication ¹	3
Credits		16
Semester 2		
MATH 392	Introduction to Ordinary Differential Equations ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 325	Intermediate Experimental Physics	3
ENGR 234	Engineering Mechanics II	3

C E 301	Mechanics of Materials ¹	3
Credits		15
Third Year		
Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
PHYS 454	Intermediate Modern Physics I	3
A E 339	Aerodynamics I ¹	3
A E 362	Orbital Mechanics ¹	3
A E 364	Flight Dynamics and Controls ¹	3
Credits		15
Semester 2		
PHYS 455	Intermediate Modern Physics II	3
A E 363	Aerospace Structures ¹	3
A E 424	Aerospace Systems Engineering	3
A E 439	Aerodynamics II ¹	3
COMM 1115G	Introduction to Communication	3
Credits		15
Fourth Year		
Semester 1		
PHYS 461	Intermediate Electricity and Magnetism I	3
A E 419	Propulsion ¹	3
A E 447	Aerofluids Laboratory ¹	3
ENGR 401	Engineering Capstone I	3
Area V: Humanities Course ³		3
Credits		15
Semester 2		
PHYS 462	Intermediate Electricity and Magnetism II	3
ENGR 402	Engineering Capstone II ¹	3
VWW: Viewing a Wider World Course ⁴		3
VWW: Viewing a Wider World Course ⁴		3
Area VI: Creative and Fine Arts Course ³		3
Credits		15
Total Credits		121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students

for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The BS in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment. The B.S. degree in Engineering Physics is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

The requirements for the Chemical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i> ¹		3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Select one sequence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ³	
Select one sequence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ³	
<i>Area IV: Social and Behavioral Sciences (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Viewing A Wider World		
Viewing a Wider World Electives ⁴		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3

<i>Natural Science</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 313	Organic Chemistry I	3
<i>Electives</i>		
Technical Elective ⁵		3
<i>Physics</i>		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
<i>Physics with Engineering Component</i>		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
<i>Engineering</i>		
CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3
CHME 352 L	Simulation of Unit Operations	2
CHME 361	Engineering Materials	3
CHME 441	Chemical Kinetics and Reactor Engineering	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 124		0
Total Credits		124

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

⁵ Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year

Semester 1		Credits
MATH 1511G	Calculus and Analytic Geometry I ¹	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ^{1,2}	4
CHME 101	Introduction to Chemical Engineering Calculations ¹	2
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
Credits		14

Semester 2

MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ^{1,2}	4
CHME 102	Material Balances ¹	2
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
Credits		14

Second Year

Semester 1		
MATH 2530G	Calculus III ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4
CHME 201	Energy Balances & Basic Thermodynamics ¹	3
ENGL 1110G	Composition I	4
Area IV: Creative and Fine Arts Course ³		3
Credits		17

Semester 2

MATH 392	Introduction to Ordinary Differential Equations ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 325	Intermediate Experimental Physics	3
CHME 303	Chemical Engineering Thermodynamics ¹	4
CHME 305	Transport Operations I: Fluid Flow ¹	3
Credits		16

Third Year

Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
PHYS 461	Intermediate Electricity and Magnetism I ¹	3
CHME 306	Transport Operations II: Heat and Mass Transfer ¹	4
CHEM 313	Organic Chemistry I ¹	3
ENGL 2210G	Professional & Technical Communication	3
Credits		16

Semester 2

PHYS 462	Intermediate Electricity and Magnetism II ¹	3
CHME 307	Transport Operations III: Staged Operations ¹	3
CHME 352 L	Simulation of Unit Operations ¹	2
CHME 361	Engineering Materials ¹	3
CHME 441	Chemical Kinetics and Reactor Engineering ¹	3
COMM 1115G	Introduction to Communication	3
Credits		17

Fourth Year

Semester 1

PHYS 451	Intermediate Mechanics I ¹	3
PHYS 454	Intermediate Modern Physics I ¹	3
ENGR 401	Engineering Capstone I	3
VWW: Viewing a Wider World Course ⁴		3
Technical Elective Course ⁵		3
Credits		15

Semester 2

PHYS 455	Intermediate Modern Physics II ¹	3
ENGR 402	Engineering Capstone II ¹	3
VWW: Viewing a Wider World Course ⁴		3
Area IV: Social and Behavioral Science Course ³		3
Area V: Humanities Course ³		3
Credits		15
Total Credits		124

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses.

⁵ Approved technical electives are decided by Engineering Physics advisors

Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The B.S. in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment. The B.S. degree in Engineering Physics is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

The requirements for the Electrical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121-122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i> ¹		3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Select one sequence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ³	
Select one sequence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ³	
<i>Area IV: Social and Behavioral Sciences (3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Viewing A Wider World		
Viewing a Wider World Electives ⁴		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
<i>Natural Science</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
<i>Electives</i>		
Technical Elective ⁵		3
Select one of the following:		3-4
PHYS 462	Intermediate Electricity and Magnetism II	
E E 340	Fields and Waves	

Physics

PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 475 or PHYS 471 or PHYS 493	Advanced Laboratory Practices for Materials Modern Experimental Optics Experimental Nuclear Physics	3

Physics with Engineering Component

PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 480	Thermodynamics	3

Engineering

ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3

Second Language: (not required)

Electives, to bring the total credits to 121-122	0
Total Credits	121-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses. See Alternatives for meeting VWV requirements (nine-credit rule).

⁵ Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
ENGR 120	DC Circuit Analysis	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ^{1,2}	4

Credits 16

Semester 2

ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ^{1,2}	4

Credits 16

Second Year**Semester 1**

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 230	AC Circuit Analysis	4
MATH 2530G	Calculus III ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4

Credits 15

Semester 2

E E 200	Linear Algebra, Probability and Statistics Applications ¹	4
ENGL 2210G	Professional & Technical Communication	3
MATH 392	Introduction to Ordinary Differential Equations ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 325	Intermediate Experimental Physics	3

Credits 16

Third Year**Semester 1**

COMM 1115G	Introduction to Communication	3
PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
PHYS 451	Intermediate Mechanics I ¹	3
PHYS 461	Intermediate Electricity and Magnetism I ¹	3
Area V: Humanities Course ³		3

Credits 15

Semester 2

E E 317	Semiconductor Devices and Electronics I ¹	4
Choose from one of the following:		3-4
PHYS 462	Intermediate Electricity and Magnetism II ¹	
E E 340	Fields and Waves ¹	
Choose from one of the following:		3
PHYS 475	Advanced Laboratory Practices for Materials ¹	
PHYS 493	Experimental Nuclear Physics ¹	
PHYS 471	Modern Experimental Optics ¹	
Area IV: Social and Behavioral Science Course ³		3

Credits 13-14

Fourth Year**Semester 1**

PHYS 454	Intermediate Modern Physics I ¹	3
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E E 320	Signals and Systems I	3
ENGR 401	Engineering Capstone I	3
VWW: Viewing a Wider World Course ⁴		3
Technical Elective Course ⁵		3

Credits 15

Semester 2

PHYS 455	Intermediate Modern Physics II ¹	3
PHYS 480	Thermodynamics	3
ENGR 402	Engineering Capstone II ¹	3
Area VI: Creative and Fine Arts Course ³		3
VWW: Viewing a Wider World Course ⁴		3

Credits 15

Total Credits 121-122

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Technical electives are approved by the Engineering Physics advisors

Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The B.S. in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment. The BS degree in Engineering Physics is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

The requirements for the Mechanical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework

will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2¹</i>		3
<i>Oral Communication¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Select one sequence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ³	
Select one sequence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ³	
<i>Area IV: Social and Behavioral Sciences (3 credits)¹</i>		
<i>Area V: Humanities¹</i>		3
<i>Area VI: Creative and Fine Arts¹</i>		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II Calculus and Analytic Geometry II Honors	4
Viewing A Wider World		
Viewing a Wider World Electives ⁴		6
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
<i>Natural Science</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
<i>Electives</i>		
Technical Elective ⁵		3
<i>Physics</i>		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
<i>Physics with Engineering Component</i>		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
<i>Engineering</i>		
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3

M E 261	Mechanical Engineering Problem Solving	3
M E 326	Mechanical Design	3
M E 338	Fluid Mechanics	3
M E 341	Heat Transfer	3
M E 425	Design of Machine Elements	3
ENGR 110	Introduction to Engineering Design	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 120		2
Total Credits		120

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses.
- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
- ³ PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
- ⁴ See the Viewing a Wider World (p. 220) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).
- ⁵ Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year		
Semester 1		Credits
MATH 1511G	Calculus and Analytic Geometry I ¹	4
ENGL 1110G	Composition I ¹	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ^{1,2}	4
ENGR 110	Introduction to Engineering Design	3
Credits		15
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ^{1,2}	4
M E 240	Thermodynamics ¹	3
Credits		15

Second Year**Semester 1**

MATH 2530G	Calculus III ¹	3
ENGL 2210G	Professional & Technical Communication ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4
ENGR 233	Engineering Mechanics I	3
Area IV: Social and Behavioral Science Course ³		3
Credits		16

Semester 2

MATH 392	Introduction to Ordinary Differential Equations ¹	3
C E 301	Mechanics of Materials ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 325	Intermediate Experimental Physics	3
ENGR 234	Engineering Mechanics II	3
Credits		15

Third Year**Semester 1**

PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
PHYS 454	Intermediate Modern Physics I	3
M E 261	Mechanical Engineering Problem Solving	3
M E 326	Mechanical Design ¹	3
M E 338	Fluid Mechanics ¹	3
Credits		15

Semester 2

PHYS 455	Intermediate Modern Physics II	3
M E 425	Design of Machine Elements ¹	3
Area V: Humanities Course ³		3
VWW: Viewing a Wider World Course ⁴		3
VWW: Viewing a Wider World Course ⁴		3
Credits		15

Fourth Year**Semester 1**

PHYS 451	Intermediate Mechanics I ¹	3
PHYS 461	Intermediate Electricity and Magnetism I	3
ENGR 401	Engineering Capstone I	3
COMM 1115G	Introduction to Communication	3
Area VI: Creative and Fine Arts Course ³		3
Credits		15

Semester 2

PHYS 462	Intermediate Electricity and Magnetism II	3
M E 341	Heat Transfer	3
ENGR 402	Engineering Capstone II ¹	3
Technical Elective Course ⁵		3
Elective Course		2
Credits		14
Total Credits		120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements

² PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area

III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

³ See the General Education (p. 220) section of the catalog for a full list of courses.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁵ Technical electives are approved by Engineering Physics advisors

Engineering Technology and Surveying Engineering

Undergraduate Program Information

Mission Statement

The mission of the Department of Engineering Technology and Survey Engineering (<https://et.nmsu.edu/>) (ETSE) is to provide a student-centric education through experiential learning to prepare students for a rewarding career. In particular,

- faculty work closely with students and each other to foster a family-like environment;
- unlike traditional engineering, core courses have labs with team projects and hands-on learning experiences; and
- graduates advance to enhanced career opportunities with competitive compensation.

Our goal is to help students from diverse backgrounds reach their potential and become successful engineers, technologists, and leaders in the region and nationwide.

Programs Overview

Under the motto of “linking theory and application,” the ETSE curriculum emphasizes the practical hands-on application of engineering principles and methods. ETSE students learn about designing, building, and testing systems through in-class exercises, hands-on laboratory projects, and teamwork. This approach provides ETSE students with a holistic view of their fields and prepares them to be effective real-world problem solvers. A wide variety of majors, concentrations, and minors are offered by the ETSE Department, including:

Bachelor Degrees with majors and concentrations in:

- **Civil Engineering Technology (CET)**
 - Renewable Energy Technologies
 - Transportation Technology
- **Electronics and Computer Engineering Technology (ECET)**
- **Geomatics**
- **Information and Communication Technology (ICT)**
 - Cyber Defense
 - Network Technologies
 - Software Development
- **Information Engineering Technology (IET)**
- **Mechanical Engineering Technology (MET)**

The *Bachelor of Science* curricula is developed based on the program criteria established collaboratively by their **ABET** accreditation commissions (*Engineering Technology Association Commission* and the *Applied and Natural Science Accreditation Commission*, respectively) and the programs' Industrial Advisory Committees (IAC). Visit

the ETSE website for further information on ABET accreditation and program criteria.

The *Geomatics* and *ICT* programs are 100% online while enrolled at the NMSU main campus or the NMSU Online (<https://online.nmsu.edu/campus>). The ETSE online programs allow you to complete your undergraduate education from anywhere, interact with faculty virtually, and access online resources anytime.

Graduate Program Information

Mission Statement

The mission of the Engineering Technology and Surveying Engineering Department regarding graduate education is to provide a 100% online, asynchronous, professional post-baccalaureate education focused on providing graduates with advanced knowledge and skills that will augment career opportunities. The ETSE department fosters educational excellence and provides working professionals and traditional technology students with opportunities to increase their knowledge and skillsets.

Program Overview

The ETSE Department offers the Professional Masters of Information Technology (M-IT) (<http://catalogs.nmsu.edu/online/nmsu-online/information-technology-mit-online/>), designed for working IT professionals and students interested in pursuing an advanced technology degree. Topics include system architecture, computer networking, development and application of software tools, cybersecurity, and virtual systems in the context of enterprise IT decision-making.

The M-IT program's vision is to provide an advanced Information Technology education that is contemporary and relevant to recent IT graduates and long-time IT professionals. The program strives to be accessible in delivery and flexible in the curriculum.

The requirements for enrollment into the Professional Master of Information Technology program are as follows:

- Bachelor's degree in Information Technology or a closely related field (must submit transcripts)
- Undergraduate GPA of 3.0/4.0 or higher
- Statement of purpose – One page describing your experiences and background, professional goals, and your reason for applying to the M-IT program
- Contact information for two recommendations
- Applicants with an undergraduate GPA greater than 2.5/4.0 but less than 3.0/4.0 may be accepted provisionally on a case-by-case basis.
- Applicants that do not have a Bachelor's degree in Information Technology or a closely related field but have relevant IT experience may apply. If accepted, the graduate advisor will design a plan of study that may include appropriate leveling courses.
- GRE scores are not required for applicants that have earned their undergraduate degree from an accredited US University.

Master's Accelerated Program

The Master's Accelerated Program (MAP) option combines some of the baccalaureate degree requirements in IET or ICT and the professional Master of Information Technology. Visit the Masters Accelerated Program (MAP) (<https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html>) website for further details. This option will add a pre-application process as detailed below:

Pre-Application Process: Students will submit a "pre-application" to the ETSE department to receive approval for the accelerated professional Master's program. Students interested in completing the MAP must submit the pre-application within approximately 12 credits of earning a Bachelor's degree in an IET or BICT; the ETSE department website will include an application form. Qualification for the Bachelor + Masters of IT (B+M-IT) program will be based on the cumulative grade point average in courses taken to that point and recommendations by faculty members listed on the departmental application. Students having a grade point average below 3.0 may be admitted on a case-by-case basis, depending on faculty recommendations and evaluations of the individual's academic and professional history. Additional factors might be considered when available (e.g., TOEFL/IELTS scores).

Once the ETSE department has reviewed the pre-application, accepted, and notified the applicant of acceptance in the accelerated program, the applicant must formally apply to the graduate school for formal admission into the M-IT program. Students must apply to the NMSU Graduate School during the final semester of their undergraduate program education.

Note: The student must apply to the B+M-IT accelerated program **before** taking any 450 (and above) level courses.

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Degrees for the Department

Bachelor Degree(s)

- Engineering Technology - Civil (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology (p. 1027)
- Engineering Technology - Civil (Transportation Technology) - Bachelor of Science in Engineering Technology (p. 1029)
- Engineering Technology - Civil - Bachelor of Science in Engineering Technology (p. 1025)
- Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology (p. 1031)
- Engineering Technology - Information - Bachelor of Science in Engineering Technology (p. 1033)
- Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology (p. 1035)
- Geomatics - Bachelor of Science in Geomatics (p. 1037)
- Geomatics - Bachelor of Science in Geomatics (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/geomatics-bs-geomatics-online/>)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (p. 1043)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-cyber-defense-bict-online/>)
- Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-network-technologies-bict-online/>)
- Information and Communication Technology (Network Technologies) - Bachelor of Information Communication Technology (p. 1046)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (p. 1049)

- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-software-development-bict-online/>)
- Information and Communication Technology - Bachelor of Information and Communication Technology (p. 1039)
- Information and Communication Technology - Bachelor of Information and Communication Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online-information-communication-technology-bict-online/>)

Master Degree(s)

- Information Technology - Master of Information Technology (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/information-technology-mit-online/>)

Minors for the Department

- Digital Electronic Applications - Undergraduate Minor (p. 1052)
- Digital Forensics - Undergraduate Minor (p. 1052)
- Geomatics - Undergraduate Minor (p. 1052)
- Information Security Technology - Undergraduate Minor (p. 1053)
- Manufacturing - Undergraduate Minor (p. 1053)
- Renewable Energy Technologies - Undergraduate Minor (p. 1053)

Department Faculty Members

Associate Professor Gabe Garcia Ph. D., Interim Department Head

Associate Professor Bárbara Gamillo, Associate Department Head

Professors Elaksher^{1,2}, Jiang¹, Sassenfeld; **Associate Professors** Ben Ayed, Braker, Furth, B. Gamillo, Garcia, Nogales, Tapia, Wurm²; **Assistant Professors** Bello, Elshinawy, E. Gamillo; **Professor of Practice** Kanaan, Lawrence; **Emeritus Faculty** Alexander, Burkholder^{1,2}, Cameron, Cooper¹, Hyde, Kelly, Reilly², Ricketts, Rico, Stevens¹.

¹ Registered Professional Engineer (NM).

² Licensed Professional Surveyor (NM).

Engineering Technology Courses

E T 101. Introduction to Engineering Technology and Geomatics 1 Credit (1)

An introduction to geomatics and the various engineering technology disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities.

Learning Outcomes

1. Develop a basic understanding of all programs in the Engineering Technology and Surveying Engineering Department.
2. Create a solid curriculum plan for their degree program.
3. Describe the Engineering Design Process.
4. Define and visit campus support programs and student engineering programs.
5. Describe and discuss communication skills in the engineering profession.

E T 104. Soldering Techniques

1 Credit (3P)

Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards.

E T 109. Computer Drafting Fundamentals

3 Credits (2+2P)

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and C E 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

E T 110. Introduction to 3-D Modeling (Solid Works)

3 Credits (2+3P)

Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies.

E T 120. Computation Software

2-3 Credits (2-3)

The use of spreadsheet software in the field of engineering technology.

E T 125. Introduction to Renewable Energy

3 Credits (3)

Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

E T 143. Civil/Survey Drafting I**3 Credits (2+2P)**

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic mapping, contour drawings, plan, and profiles as street/highway layout. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 109 or DRFT 109.

Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil 3D software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting and trigonometry is required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.

E T 153. Fundamentals of Networking Communications**3 Credits (3)**

Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling.

Learning Outcomes

1. Students will identify network types/protocols utilizing the OSI reference model and compute numbering system network problems.
2. Students will explain issues related to managing and documenting network environments.
3. Students will list, compare, and discuss industry standards for addressing computers on a network.
4. Students will list and distinguish between computer networking historical milestones.
5. Students will identify, compare, and evaluate networking data transport techniques.
6. Students will identify and compare network transmission media and build/evaluate network cabling.
7. Students will discuss IT industry certifications and summarize current technology trends.

E T 154. Construction Methods and Communications**3 Credits (3)**

Blueprint reading, specifications, and introduction to materials used in construction. May be repeated up to 3 credits.

Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil Three-Dimensional software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting, and trigonometry as required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.

E T 155. Network Operating Systems I**3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to: Community Colleges only.

Prerequisite(s): E T 120 or E T 122.

E T 156. Introduction to Information Security**2 Credits (2)**

This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.

Prerequisite(s)/Corequisite(s): E T 120. Restricted to Community Colleges campuses only.

E T 160. Windows Fundamentals for IET**3 Credits (3)**

Fundamental review of the Windows operating system including installation and upgrades as well as managing applications, files, folders, devices and maintenance.

Learning Outcomes

1. Properly deploy the Windows OS.
2. Manage Windows OS data and devices.
3. Apply network and connection configurations.
4. Provide Windows OS maintenance.

E T 182. Introduction to Digital Logic**2 Credits (1.5+1.5P)**

An introduction to logic design and the basic building blocks of digital systems. Topics include numbering systems, Boolean algebra, digital logic theory, combinational logic, and applications such as adders. Includes hands-on laboratory

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Demonstrate ability to convert numerical values to commonly-used digital representations and their use for arithmetic and logical functions.
2. Demonstrate understanding of Boolean logic functions and truth tables.
3. Demonstrate ability to simplify logic expressions.
4. Demonstrate understanding of combinational logic functions, and the ability to build digital circuits using breadboards.

E T 183. Applied DC Circuits**3 Credits (2+2P)**

Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab.

Prerequisite(s)/Corequisite(s): MATH 1220G.

E T 183 L. Applied DC Circuits Lab**1 Credit (2P)**

DC applied circuits lab.

Corequisite(s): E T 183.

E T 184. Applied AC Circuits**2-3 Credits (1-2+2P)**

Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab.

Prerequisite: A grade of C- or better in ENGR 120.

Learning Outcomes

1. Analyze and design AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving AC circuits.

E T 190. Applied Circuits**4 Credits (3+2P)**

Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab. May be repeated up to 4 credits.

Prerequisite/Corequisite: MATH 1250G or higher.

Learning Outcomes

1. Analyze and design DC and AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving DC and AC circuits.

E T 191. Applied Circuits Laboratory**1 Credit (2P)**

Applied Circuits Lab

E T 200. Special Topics**1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

E T 210. Intermediate 3-D Modeling (Solid Works)**3 Credits (3)**

Intermediate 3-D modeling. Applied modeling of techniques to prepare for SolidWorks certification (CSWA).

Prerequisite: A grade of C- or better in ENGR 110.

Learning Outcomes

1. Properly operate a CAD system in the most efficient manner.
2. Generate and easily update Part models.
3. Ability to create complex assembly models.
4. Create usable production drawings from Three-Dimensional CAD models.
5. Understand the basic fundamentals of available add-in software compatible with SolidWorks (FEA, CAM, PDM).
6. Work in a group and operate effectively on a team.
7. Use creative and technical thinking skills in design.

E T 217. Manufacturing Processes**3 Credits (3)**

Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: I E 217.

Prerequisite: E T 110 and MATH 1220G.

Learning Outcomes

1. Various

E T 217 L. Manufacturing Processes Lab**1 Credit (3P)**

Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining.

Corequisite: E T 217.

Learning Outcomes

1. Various

E T 220. Internship**1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): E T 283.

E T 240. Applied Statics**3 Credits (3)**

Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams.

Prerequisite(s)/Corequisite(s): MATH 1430G or MATH 1511G.

Prerequisite(s): PHYS 1230G or PHYS 1310G.

E T 241. Applied Dynamics**3 Credits (3)**

The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum.

Prerequisite: A grade of C- or better in either E T 240 or ENGR 233.

Prerequisite/Corequisite: (MATH 1440 or MATH 1521G or MATH 1521H).

Learning Outcomes

1. Various

E T 246. Electronic Devices I**4 Credits (3+3P)**

Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers.

Prerequisite: A grade of C- or better in one of the following: E T 190 or E T 183.

Prerequisite/Corequisite: E T 184 or ENGR 230.

Learning Outcomes

1. Describe semiconductor devices and their properties.
2. Apply the characteristics of diodes to analyze diode rectifier and regulator circuits.
3. Apply the characteristics of bipolar junction transistors (BJTs) to analyze BJT amplifier circuits.
4. Apply the characteristics of metal-oxide-semiconductor field-effect transistors (MOSFETs) to analyze MOSFET amplifier circuits.
5. Describe and analyze complementary MOS (CMOS) digital circuits.
6. Learn to solder and layout printed-circuit boards (PCBs).
7. Design, simulate, and test diode and transistor-amplifier circuits.

E T 253. Networking Operating Systems II**3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

Prerequisite: E T 120 and E T 153.

Learning Outcomes

1. Identify Linux utilities and terminology.
2. Use the Linux filesystem.
3. Install, administer, and manage a Linux system.
4. Utilize Linux user/group management.
5. Install software packages.
6. Apply data management skills.

E T 254. Concrete Technology**3 Credits (2+2P)**

Fundamentals of aggregates, Portland cement, and asphalt used in design and construction. May be repeated up to 3 credits.

Learning Outcomes

1. Define the fundamentals of aggregates and their use in construction including concrete and asphalt.
2. Define the types of concrete and their uses.
3. Prepare and test concrete mix designs.
4. Executing tests for AASHTO Certification.

E T 255. Linux System Administration**3 Credits (3)**

Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.

Learning Outcomes

1. Describe the key features of the Linux operating system.
2. Plan the Linux Filesystem to match system requirements.
3. Design BASH scripts to optimize common Linux operations.
4. Interpret Linux performance data to solve hardware and software issues.
5. Students will demonstrate the Core Linux System Administration.
6. Students will be able to link the use of shell commands to managing Linux server daemons and software.
7. Students will apply these concepts to build application servers running Linux, Apache, MySQL, and PHP (LAMP); Tomcat, CUPS print servers; and create backup solutions.
8. Students will apply problem analysis, object-oriented structured logic, and development concepts.
9. Students will demonstrate an understanding of theory and hands-on experience administrating a Linux Based server.

E T 256. Networking Operating Systems III**3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

Prerequisite(s): E T 253.

E T 262. Software Technology I**3 Credits (2+2P)**

An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society.

Prerequisite/Corequisite: (E T 182 or ENGR 130) or (MATH 1250G or MATH 1430G).

Learning Outcomes

1. Set up and use a rich programming environment for programming with C
2. Analyze existing code
3. Employ effective use of basic programming and basic troubleshooting
4. Write, debug and test code given software requirements
5. Apply testing and documentation best practices
6. Transfer programming knowledge and apply coding knowledge

E T 272. Electronic Devices II**4 Credits (3+3P)**

Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks.

Prerequisite: A grade of C- or better in E T 246.

Learning Outcomes

1. Design ideal operational amplifier (opamp) circuits.
2. Determine the frequency response of BJT and MOSFET amplifier circuits.
3. Predict the impact of non-ideal properties of opamps on opamp circuits.
4. Design opamp integrator and differentiator circuits.
5. Implement electronic wave-generating and wave-shaping circuits.
6. Solder and layout surface-mount printed-circuit boards (PCBs).
7. Simulate and test opamp and transistor-amplifier circuits.

E T 273. Advanced Networking Communications**4 Credits (2+4P)**

Explores advanced networking communications to include Wireless Networking, Virtualization and Cloud Computing, Subnets and VLANs, Network Risk Management, Network Security Design, Network Performance, and WANS. The course covers the examination objectives and detailed preparation for students to take the CompTIA Network+ exam.

Prerequisite: E T 153.

Learning Outcomes

1. Identify, describe, and apply wireless transmission characteristics and standards.
2. Explain the benefits of cloud virtualization and cloud computing.
3. Explain the purpose of network segmentation and describe how VLANs work and how they are used.
4. Identify basic concepts of network risk management and configure devices for increased security.
5. Identify network design security features and discuss options in network access control.
6. Use tools to evaluate network performance and discuss best practices for incident response and disaster recovery.
7. Explain characteristics of WAN technology and troubleshoot connection methods.

E T 276. Electronic Communications**3 Credits (2+2P)**

Antennas, transmission devices, A-M and F-M transmission and detection, pulse systems, microwave systems.

Prerequisite(s): E T 246.

E T 280. Web Design and Multimedia**3 Credits (3)**

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.

Learning Outcomes

1. Create multiple frontend development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

E T 282. Digital Electronics**4 Credits (3+3P)**

Applications of digital integrated circuits, multiplexers, counters, arithmetic circuits, and microprocessors.

Prerequisite(s)/Corequisite(s): (E T 190 or E T 184). **Prerequisite(s):** E T 182.

E T 283. Hardware PC Maintenance**3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer hardware components.

Prerequisite(s): E T 120 or E T 122.

E T 284. Software PC Maintenance**3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer operating systems.

Prerequisite(s): E T 120 or E T 122.

E T 285. Advanced Information Security**3 Credits (3)**

The course covers detailed analysis of network security, including security operations and policy adherence; internal and external vulnerabilities; methods of identifying, controlling and managing system access, and the protection of system information.

Prerequisite(s)/Corequisite(s): E T 283. **Prerequisite(s):** E T 156.

E T 286. Information Security Certification Preparation**4 Credits (4)**

The course covers the examination objectives and detailed preparation for a certification in information security.

Prerequisite(s): E T 285.

E T 290. Networking Wireless Communication**3 Credits (3+1P)**

This course provides an introduction to wireless networking and communications. Some of the topics covered are protocols, transmission methods, and IEEE 802.11 standards. Wireless LAN (WLAN) fundamentals, devices, and security, cellular telephony, broadband, and satellite communications.

Prerequisite: E T 273.

E T 291. PC Forensics and Investigation**3 Credits (3)**

Introduction to computer forensics and investigative fundamentals.

Topics include understanding computer forensic and investigation law and requirements, processing crime and incident scenes, and the extraction, preservation, analysis and presentation of computer-related evidence.

Prerequisite(s): E T 120 or E T 122.

E T 300. Special Topics**1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

E T 305. Introduction to Product Design**3 Credits (2+3P)**

The process of designing an innovative product for a real customer. Working through ideas, prototypes, 3-D models, concept validation, and entrepreneurship.

Prerequisite: A grade of C- or better in (COMM 1115G or COMM 1130G or AXED 2120G or HNRS 2175G) or consent of instructor for non-MET majors.

Prerequisite/Corequisite: E T 210 and E T 217.

Learning Outcomes

1. Learn and follow design process.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting ideas and concepts orally.
4. Learn and apply creative problem-solving techniques.
5. Perform interviews with customer.
6. Translate customer needs into product specifications.
7. Design novel product for customer.
8. Build low-resolution prototype of product.
9. Develop a recognition of the importance of innovation and entrepreneurship.

E T 306. Fundamental and Applied Thermodynamics**3 Credits (3)**

First and second laws, properties of substances, thermodynamic cycles including power generation and refrigeration.

Prerequisite: A grade of C- or better in the following: CHEM 1120G and ENGR 233 and (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).

Corequisite: E T 306 L.

Prerequisite/Corequisite: ENGR 140, and (MATH 1440 or MATH 1521G).

Learning Outcomes

1. Students will acquire an understanding of the physical concepts and basic principles of fundamental and applied thermodynamics.
2. Students will become acquainted with the problem-solving methods and tools in the field of applied thermodynamics,
3. Students will gain experience through practice in the implementation of systematic, fundamental approaches to solving problems in applied thermodynamics.

E T 306 L. Thermodynamics Lab**1 Credit (3P)**

Applications of thermodynamic theory to lab devices. Practice in testing, instrumentation, and data collection.

Corequisite: E T 306.

Learning Outcomes

1. Effectively communicate results of laboratory work and in-class studies in written formal technical reports.
2. Present one lab experiment through a PowerPoint presentation.
3. Find thermodynamic properties through lab experiments.
4. Describe performance indicators of a laboratory refrigeration cycle and a heat engine.
5. Describe power plant operation.

E T 308. Fluid Technology**3 Credits (3)**

Application of basic principles of fluid mechanics to practical applied problems.

Prerequisite: A grade of C- or better in both, (MATH 1435 or MATH 1511G) and (E T 240 or ENGR 233).

Corequisite: E T 308 L.

Learning Outcomes

1. Solve hydrostatic problems.
2. Describe and measure physical properties of a fluid.
3. Describe the motion of fluids.
4. Apply conservation equations.
5. Design pipeline and pump systems.

E T 308 L. Fluid Technology Lab**1 Credit (3P)**

Measurements in fluid statics, dynamics, and hydraulic systems.

Corequisite: E T 308.

Learning Outcomes

1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Experimentally find properties of fluids.
3. Experiment head losses in pipe flows.
4. Analyze pipeline systems and open channel flows.
5. Analyze flow regimes and equipment selection.

E T 309V. Manufacturing: History and Technology**3 Credits (3)**

The history of manufacturing, the technology on which it is based, and its impact on society.

E T 310. Applied Strength of Materials**3 Credits (3)**

Application of principles of strength of materials to practical design and analysis problems.

Prerequisite: A grade of C- or better in E T 240 or ENGR 233.

Corequisite: E T 310 L.

Prerequisite/Corequisite: ENGR 190 or MATH 1440 or MATH 1521G or MATH 1521H.

Learning Outcomes

1. To obtain knowledge of basic engineering materials and their use in civil and mechanical construction.
2. To perform basic structural analysis, stress, strain and deformation calculations as they apply to current engineering practices.
3. To conduct appropriate experiments in the laboratory as they apply to straight of materials and be able to interpret the results.
4. To effectively communicate results of laboratory work and in-class studies in written memoranda, business letters, and formal technical reports.
5. To recognize that the field of engineering materials is constantly changing and therefore, needs to be studied throughout one's career.

E T 310 L. Applied Strength of Materials Lab**1 Credit (3P)**

Testing and analyzing the physical properties of materials. cursory review of Excel, PowerPoint, FEA, Instron machine, and testing standards.

Corequisite: E T 310.

Learning Outcomes

1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Demonstrate an understanding of the tensile, compressive, shear, torsional and buckling properties of basic materials through hands-on testing per ASTM Standards.
3. Evaluate the results of the hands-on laboratory testing through modeling exercises using SOLIDWORKS simulations.
4. Effectively communicate industry practices through oral presentations of ASTM standards.

E T 314. Communications Systems I**3 Credits (3)**

Circuits and devices used for transmission, reception, and processing of RF signals. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in both, E T 246 and (MATH 1250G or higher).

Learning Outcomes

1. Analyze analog and digital communication systems.
2. Apply the fundamental communication concepts of AM and FM techniques.
3. Build an AM/FM communication system.
4. Apply basic antenna theory and satellite communication theory.

E T 317. Advanced Manufacturing and Design**3 Credits (3)**

Advanced 3-D modeling with current engineering design practices. Students will use SolidWorks add-ins such as CAMWorks, Product Data Management (PDM), and Model-Based Definition in conjunction with Geometric Dimensioning and Tolerancing (GD&T) practices. Students will have the opportunity to take the Certification SolidWorks Professional Exam (CSWP).

Prerequisite: A grade of C- or better in both, E T 210 and E T 217 or ENGR 217.

Learning Outcomes

1. Create manufacturing drawing packages in accordance with ANSI.
2. Relate design data using proper geometric dimensioning and tolerancing practices.
3. Knowledge of advanced manufacturing processes.
4. Knowledge of requirements design for manufacturability (DFM).
5. Write and understand G-Code toolpaths.
6. Use CAD/CAM systems to create toolpaths.
7. Operate and setup CNC machining center.
8. Work in a group and operate effectively on a team.
9. Use creative and technical thinking skills in design.

E T 324. Signal Processing and Filtering**4 Credits (3+3P)**

Application of digital and analog signal conversion models. Discrete time signals and systems. Time and frequency domain concepts. Presentation of Fourier and Z transforms. Application of analog and digital signal filtering with and without feedback.

Prerequisite: A grade of C- or better in E T 272 and (ENGR 140 or E T 262).

Prerequisite/Corequisite: (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).

Learning Outcomes

1. Analyze signals and systems and differentiate between discrete and continuous-time signals and systems.
2. Determine the impulse response of a differential or difference equation.
3. Apply the convolution theorem for continuous-time signals to determine the response of linear systems.
4. Evaluate the Fourier series of periodic signals.
5. Apply bilateral Laplace transforms for continuous signals and Z transforms for discrete signals.
6. Apply the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous-time signals in discrete time.
7. Design and analyze signals and systems using the programming language MATLAB and /or Simulink.

E T 328. Kinematics of Machines**3 Credits (2+3P)**

Kinematic analysis of machine elements using linkages, cams, and gears. Applied design of mechanical systems using SolidWorks simulation and Excel modeling.

Prerequisite: A grade of C- or better in both, E T 210 and (E T 241 or ENGR 234).

Prerequisite/Corequisite: E T 305.

Learning Outcomes

1. Design mechanical device with specific points of motion to solve engineering problem.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting technical concepts in writing and orally.
4. Develop understanding of classic four bar mechanisms, including crank-rocker, crank-crank, double-rocker, and crank-slider.
5. Using algebra and trigonometry, analyze points of motion for displacement, velocity, and acceleration.
6. Using SolidWorks Motion Analysis, analyze points of motion for displacement, velocity, and acceleration.
7. Reverse-engineer a Franz Rouleaux mechanism.

E T 332. Applied Design of Structures I**4 Credits (3+3P)**

An introduction to structural analysis and design. Use of various building codes for development of allowable and factored loads on structures. Allowable stress and strength design concepts for structural components using concrete and steel. Required use of computer software such as spreadsheets, databases, and self-developed programs and design aids.

Prerequisite: A grade of C- or better in both, E T 310 and (ENGR 190 or MATH 1440 or MATH 1521G or higher).

Learning Outcomes

1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design structural components of a system, component, or process to meet desired needs.
3. Identify, formulate, and solve structural analysis problems.
4. Describe professional and ethical responsibility.
5. Communicate effectively with peers and faculty.

E T 339. Introduction to Digital Forensics and Incident Response**3 Credits (2+3P)**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.

Prerequisite: A grade of C- or better in both, E T 255 and E T 160.

Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

E T 344. Microcomputer Systems**3 Credits (2+3P)**

Microcomputer and/or microcontroller systems applications and architectures with a software emphasis using programming languages. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or higher).

Prerequisite/Corequisite: E T 362.

Learning Outcomes

1. Compare and contrast microprocessor architectures and their characteristics.
2. Configure a Nios II microprocessor architecture core on an FPGA.
3. Write programs in assembly language targeting the Nios II microprocessor.
4. Write programs in C targeting the Nios II microprocessor.
5. Present, demonstrate and document a team project.

E T 354. Soil and Foundation Technology**4 Credits (3+3P)**

Fundamentals of investigation of soil properties and their importance in design, construction, and testing as related to buildings, roads, dams, and other structures. Design of foundations considering slope stability, bearing capacity and settlement.

Prerequisite: A grade of C- or better in E T 254.

Prerequisite/Corequisite: E T 310.

Learning Outcomes

1. Demonstrate an understanding of the basic soil types and the accepted soil classification systems: USCS, AASHTO, USDA.
2. Demonstrate an understanding of the various engineering properties of soils and how they apply to the built environment: compaction, permeability, consolidation, shear strength and stress distribution.
3. Perform advance calculations on lateral earth pressure, retaining structures and slope stability.
4. Perform basic designs of shallow foundations and pile structures.
5. Demonstrate an ability to perform laboratory tests: soil classification, Atterburg Limits, compaction (proctors), permeability, shear strength, and compression. Confirm these abilities through completion of the NMDOT soil testing certification program.

E T 355. Site/Land Development and Layout**3 Credits (3)**

Techniques, methods, and takeoffs for infrastructure layout, site plan design, grading, earthwork, utilities, road construction. Students must be in Junior or Senior standing to enroll.

Prerequisite: A grade of C- or better in E T 143 or DRFT 143 or DRFT 153.

Learning Outcomes

1. Describe the purpose of Land Development and its process.
2. Define Feasibility and Programming (Environmental policy, Environmental Site Feasibility, Engineering Feasibility) for land development.
3. Base Map Preparation (Control Surveys, Boundary Surveys Topographic Surveys).
4. Examine Flood Plain Studies (FEMA) and Preliminary Hydrological Analysis.
5. Compute the TOC/Intensity of rainfall on a property, runoff for pre/post-development, and peak flow.
6. Implement types of Grading - Earthwork (end section method)/production estimations/Preliminary layout/Grading work Grid Method).
7. Analyze asphalt designs for different types of cross-sections.

E T 360V. Technology in Business and Society**3 Credits (2+2P)**

Examination of how technology affects business and society with specific attention to understanding the role of technical personnel and their interaction with nontechnical personnel.

E T 362. Software Technology II**3 Credits (3)**

Topics include problem analysis, object-oriented programming (OOP), structured logic, and development concepts.

Prerequisite: A grade of C- or better in either E T 262 or ENGR 140.

Prerequisite/Corequisite: MATH 1250G or Higher.

Learning Outcomes

1. Set up and use a rich programming environment for programming with Python
2. Analyze existing code
3. Employ effective use of basic programming and basic troubleshooting
4. Employ effective use of Object-Oriented Programming (OOP) and troubleshooting
5. Apply testing and documentation best practices

E T 377. Computer Networking I**3 Credits (2+2P)**

Topics include the principles and structure of the OSI model, IP addressing, media, LANs, TCP/IP networks, routing protocols (RIPv2, EIGRP, OSPF) and their advanced functionality, as well as VLANs and inter-VLAN communication. This course focuses on the architecture of networks, the configuration of devices, how to identify and resolve common issues, and troubleshooting (from physical to transport layers).

Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or Higher).

Learning Outcomes

1. Define and distinguish the role of a network administrator (from other roles in the IT world)
2. Identify the OSI model, its layers, and relationship to TCP/IP model
3. Identify different cable media and networking devices and their use
4. Design, configure, and troubleshoot basic networks.
5. Identify MAC, IPv4, and IPv6 addressing
6. Apply different techniques for IP allocation and subnet design (IPv4)
7. Use Cisco IOS software for basic switch and router configurations
8. Configure and troubleshoot basic setup for static and dynamic routing protocols

E T 381. Renewable Energy Technologies**3 Credits (3)**

Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of renewable energy technologies and performance improvements. This includes solar, wind, hydro, ocean, biomass, and geothermal energies.
3. Understand the benefits and disadvantages of using renewable resources.
4. Research or design a renewable energy system as a class project.

E T 382. Solar Energy Technologies**3 Credits (2+3P)**

Solar energy technologies, including topics in passive, solar thermal, and photovoltaic systems. Theory, practical applications, safety considerations and the economics of solar renewable energy systems compared to conventional systems.

Prerequisite: A grade of C- or better in MATH 1220G.

Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of photovoltaic and solar thermal energy technologies and performance improvements.
3. Evaluate the economics of implementing a solar system.
4. Design and size a PV or solar thermal energy system as a class project.

E T 384. Wind and Water Energy Technologies**3 Credits (3)**

Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of wind and water energy technologies and performance improvements.
3. Evaluate the economics of implementing wind or water systems.
4. Design and size a wind or water energy system as a class project.

E T 386. Sustainable Construction and Green Building Design**3 Credits (3)**

Sustainable Building materials, methods, and techniques including green architecture and design, codes, standards and specifications.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Demonstrate an understanding of the basic principles of Green Building: sustainability, life-cycle costing, triple bottom line, return periods and unintended consequences.
2. Interpret the various categories present in the LEED certification process and other green certification systems commonly used.
3. Evaluate different "green" technologies as they apply to the student's area of interest.
4. Evaluate energy efficiency scenarios and resulting cost analyses using RETScreen and RESCheck softwares.
5. Navigate the various certification opportunities as they apply to the Green Building industry.

E T 396. Heat Transfer and Applications**3 Credits (2+3P)**

Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design.

Prerequisite: A grade of C- or better in both E T 306 and E T 308.

Learning Outcomes

1. Understand the concepts and basic principles of fundamental and applied heat transfer.
2. Model and solve engineering problems involving one, two, or three heat transfer modes: conduction, convection, and radiation.
3. Analyze the performance of industrial equipment like heat exchangers.
4. Validate theoretical concepts through heat transfer lab experiments.

E T 398. Digital Systems**4 Credits (3+3P)**

Analysis, design, implementation, and testing of digital systems, including microprocessor blocks, using state machine logic, FPGAs, and hardware description language programming. May be repeated up to 4 credits.

Prerequisite: A grade of C- or better in both (E T 282 or ENGR 130) and (MATH 1250G or higher).

Prerequisite/Corequisite: E T 362.

Learning Outcomes

1. Apply design, synthesis, and analysis methods for digital systems that incorporate programmable logic devices (FPGAs).
2. Utilize CAD tools such as Altera Quartus II to design digital systems.
3. Evaluate and apply methods to analyze the timing behavior and to detect timing hazards in digital circuits.
4. Apply methods for analysis and design of sequential digital circuits with feedback.
5. Design complex circuits using VHDL Hardware Description Language (VHDL) for programming FPGA systems.

E T 400. Special Topics**1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

E T 401. Heating and Air-Conditioning Systems**3 Credits (3)**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 306.

Prerequisite/Corequisite: E T 396.

Learning Outcomes

1. Master the use of thermodynamics software, EES for this course, and design software, HVAC Calc for this course.
2. Understand the principles of indoor/outdoor psychometrics.
3. Calculate the heating/cooling loads.
4. Design/size an HVAC system for a given building through a class project.

E T 402. Instrumentation**3 Credits (2+3P)**

Sensors/transducers, signal conditioning and transmission for measurement and control systems. Student project in an area of instrumentation and/or control is required. Students be in Senior level standing to enroll.

Prerequisite/Corequisite: E T 396 or E T 398.

Learning Outcomes

1. Apply physical concepts, operational principles, and components of basic instrumentation and control in industrial process systems.
2. Learn relevant problem-solving methods and aspects of good practice.
3. Use LabView data acquisition systems, PLC ladder logic, and basic Arduino controllers.
4. Prototype a control system through a class project.

E T 410. Senior Seminar**1 Credit (1)**

Transition from academics to business and industry. Students must be senior standing in E T majors to enroll. May be repeated up to 1 credit.

Learning Outcomes

1. Explain the path to professional licensure (CET, ECET, MET).
2. Implement a plan to test and pass the fundamental exam (CET, ECET, MET).
3. Identify and work towards completing different certifications used in industry, and work towards (IET).

E T 412. Highway Technology**3 Credits (3)**

Road-vehicle performance, geometric alignment, traffic analysis, highway materials, pavement design, and plan and profile development.

Prerequisite: A grade of C- or better in E T 354.

Learning Outcomes

1. Design of a roadway including geometric design, materials selection, pavement design, and drainage.
2. Develop an understanding of design criteria based on traffic characteristics.
3. Interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 418. Applied Hydraulics**3 Credits (3)**

Introduction to hydrology, hydraulic equations, hydraulic cross-sections, control structures, and collection and distribution of water, wastewater, and storm runoff using closed conduit and open channel flow. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 308.

Learning Outcomes

1. Perform basic rainfall/runoff calculations using the Rational Method, TR-fifty-five and the Unit Hydrograph method.
2. Design hydraulic conveyance structures using Manning's equation and basic culvert equations, both by hand and various software packages.
3. Perform advanced calculations of pipe flow and head loss, both by hand and various software packages.
4. Evaluate pumping scenarios and pumping design, both by hand and various software packages.
5. Demonstrate an understanding of basic groundwater hydraulics.

E T 420. Senior Internship**1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. Taken in the senior year of program.

Prerequisites: Senior standing in E T.

E T 421. Senior Project**3 Credits (3)**

Project in an area of civil engineering technology conducted under the direction of civil engineering technology faculty member. Project must be one that can be completed within a semester and of sufficient complexity for 3 credits. Taken last semester of program. May be repeated up to 3 credits.

Learning Outcomes

1. Write a transmittal letter in a format consistent with industry practices.
2. Develop a scheduling table delineating the various project stages.
3. Develop a table of contents to organize all work documents.
4. Use the knowledge learned in CET courses to develop/design a project and prepare a professionally written report.
5. Communicate effectively with the faculty advisor and industry mentor.
6. Develop skills to work independently or in teams on a self-paced project.

E T 426. Analysis and Design of Machine Elements**3 Credits (2+3P)**

Analysis and design of power transmission components, including: gears, sprockets, belts, chains, bearings, and shafts. Experiential design project using SolidWorks and Excel modeling.

Prerequisite: A grade of C- or better in both ENGR 234 and E T 310.

Prerequisite/Corequisite: E T 305.

Learning Outcomes

1. Design mechanical device with specific machine elements to solve engineering problem.
2. Develop experience working in a team to solve design problems.
3. Develop experience presenting technical concepts in writing and orally.
4. Apply strength of materials concepts to design machine elements.
5. Learn about various types of machine elements, including shafts, sheaves, gears, sprockets, bearings, fasteners, retaining rings, o-rings, and motors.
6. Analyze the performance of various types of machine elements, including shafts, sheaves, gears, sprockets, and bearings.
7. Using SolidWorks Simulation, design and analyze machine elements and mechanical systems.
8. Conduct FEA simulation and validate results mathematically.

E T 432. Applied Design of Structures II**4 Credits (3+3P)**

Continuation of E T 332. Design of structural systems and study of their responses. Wood and masonry systems included.

Prerequisite: A grade of C- or better in E T 332.

Learning Outcomes

1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design a system, component, or process to meet desired needs.
3. To effectively function as a member of a team while designing, constructing and testing structural scale model.
4. To identify, formulate, and solve engineering problems including material selection and cost analysis.
5. Recognize of professional and ethical responsibility.

E T 435. Senior Project**3 Credits (2+3P)**

Capstone course. Practical application of student's cumulative knowledge to an assigned design projects. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required.

Learning Outcomes

1. Demonstrate an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline.
2. Demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline.
3. Demonstrate an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.
4. Demonstrate an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.
5. Demonstrate an ability to function effectively as a member as well as a leader on technical teams.

E T 439. Advanced Digital Forensics and Incident Response**3 Credits (3)**

Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.

Prerequisite: A grade of C- or better in both, E T 339 and E T 377.

Learning Outcomes

1. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
2. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

E T 444. Hardware and Software Senior Design**3 Credits (2+3P)**

The design, development, implementation, documentation and formal demonstration of a microprocessor-based application to solve an engineering problem. Emphasis on microprocessor architectural concepts and software interfacing. A student project is required. Students must be in senior standing to enroll. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in both, E T 344 and E T 398.

Learning Outcomes

1. To design, analyze and simplify digital logic circuits for practical problems.
2. To understand basic and complex digital logic circuits, such as memory, registers, and other arithmetic circuits.
3. To design sequential digital circuits using basic digital gates in Moore and Mealy model.
4. To design Finite State Machines and implement them on an FPGA board.
5. To interface different sensors and user inputs in VHDL and implement them on an FPGA board.
6. To complete a design project, working in teams, solving a real-life problem, and demonstrate their practical solution.

E T 454. Advanced Construction Technology**3 Credits (3)**

Contractor design and construction methods concerning formwork, special foundations, shoring, excavations, pilings, steel erection, and various material handling components.

Prerequisite: E T 354 and E T 355.

E T 455. Cost Estimating and Scheduling**3 Credits (3)**

Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques.

Prerequisite: junior or senior standing in E T.

E T 456. Applied Power Technologies**4 Credits (3+3P)**

Basic elements of modern power systems, energy sources, substation configuration, load cycles, and three-phase circuits. Students will gain experience in power factor correction, transmission line configurations and impedance, voltage regulation of transformers, and the per-unit system. Study of load flow, fault analysis, and economic operations is included. Students must be in junior or senior standing in order to enroll.

Prerequisite: A grade of C- or better in the following: (ENGR 190 or MATH 1435 or MATH 1511G) and E T 272 and ((PHYS 1240G and PHYS 1240L) or (PHYS 1320 and PHYS 1320L)).

Learning Outcomes

1. To apply concepts of electronics, magnetism and induction.
2. To solve single and three phase transformers circuits.
3. To understand different operations of DC machines and generators.
4. To analyze single phase and three phase power circuits in per-unit analysis.
5. To analyze transmission lines for power loss and power efficiency.
6. To understand load flow, fault analysis and economic operations of the power system generation and transmission.
7. To describe modern power systems, energy sources and substation configurations.

E T 458. Web Development and Database Applications**3 Credits (3)**

Design, planning, and building of interactive and dynamic web applications which are customizable and contain real-time information. Topics include relational databases, object oriented programming, secure-coding practices and web security, user authentication and personalization, as well as front-end and back-end technology integration.

Prerequisite: A grade of C- or better in both, E T 362 and E T 280.

Learning Outcomes

1. Setting up a development server
2. Read, design, and write code for backend web dev.
3. Design, create, and access databases that support web applications.
4. Implement effective security and authentication on Web applications

E T 459. Construction Technology and Management**3 Credits (3)**

This is a Technical Specialty course that builds on topics presented in the construction sequence thus far: E T 154, E T 254, E T 354, and E T 355. The course introduces students to the different civil engineering approach to construction and management, including planning, construction estimating & scheduling, foundations, formwork, concrete work, steel fabrication and erection installation, equipment basics, quality control, and safety. Methods and techniques involved in construction including use of Primavera Project Management® software.

Prerequisite/Corequisite: E T 354 and E T 355.

Learning Outcomes

1. Understand the basic concepts of construction planning, cost estimation, scheduling, and types of project management
2. Obtain basic knowledge on techniques to construct structures based on site condition
3. Develop work breakdown system and quantity take-offs
4. Develop project cost estimation for different construction projects
5. Prepare work schedule for construction project
6. Identify and implement the suitable method and equipment to construct various structures.

E T 463. Enterprise Linux Administration**3 Credits (3)**

Advanced Linux Includes an advanced look at the use of Coding repositories, Linux-based containers, virtual machines, and scripting tools including Dockerfiles, Vagrantfiles, and Ansible.

Prerequisite: A grade of C- or better in both, E T 255 and E T 362.

Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrastructure management software to deploy defined roles in multiple environments.

E T 464. Windows Enterprise Administration**3 Credits (3)**

Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.

Prerequisite: A grade of C- or better in E T 160 and (E T 262 or ENGR 140 or C S 172).

Learning Outcomes

1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational Structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPv4 and IPv6.
4. Analyze existing cmd shell and PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-domain trust relationship.
7. Employ effective use of the WDS service to deploy template images.

E T 471. Transportation Engineering and Technology**3 Credits (3)**

Learn the principles of transportation engineering and technology with a focus on highway engineering and traffic analysis. Provide a basic skill set that will allow a student to address most of the transportation problems. Provide a foundation for future coursework in transportation should a student wish to pursue further coursework in the field.

Prerequisite: A grade of C- or better in E T 354.

Learning Outcomes

1. To introduce students to techniques for designing a roadway including geometric design, materials selection, pavement design, and drainage.
2. To help students develop an understanding of design criteria based on traffic characteristics.
3. Assess student's ability to: interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 472. Intelligent Transportation Systems (ITS)**3 Credits (3)**

Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate traffic flow theory, telecommunication, and information technology applications in transportation.
2. Discover Intelligent Transportation System (ITS) architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance and in-vehicle systems, and traffic signal timing.
3. Apply knowledge of the ITS to select traffic engineering as a career path or apply the knowledge in their engineering or engineering technology career.

E T 475. Special Topics in Information Technology**3 Credits (3)**

Contemporary topics in Information Technology.

Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.

Learning Outcomes

1. Students will learn two way Bluetooth, Wi-Fi, and NFC communication technologies
2. The student will practice building and programming IOT prototype devices
3. The student will develop customer value proposition and perform one round of customer discovery
4. The student will prototype their IOT device
5. The student will demonstrate their IOT device
6. The student will learn to integrate IOT devices into IT architecture

E T 477. Computer Networking II**3 Credits (2+2P)**

Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security and firewall, network monitoring and forensics, wireless networks, high-speed optical networks and Internet.

Prerequisite: A grade of C- or better in E T 377.

Learning Outcomes

1. Demonstrate an understanding of key fundamental concepts of networking.
2. Apply networking concepts to design networks for real-life application scenarios using applicable software.
3. Configure network hardware such as computers, switches, and routers.
4. Troubleshoot, analyze, and solve network problems with applicable software.

E T 480. Innovation and Product Development**3 Credits (3)**

Experiential product design and development. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot.

Prerequisite/Corequisite: (COMM 1115G or COMM 1130G or ACOM 1130G or HNRS 2175G).

Learning Outcomes

1. Develop an understanding of Value Proposition Design methodology and apply to design product, service, or app.
2. Develop an understanding of Lean LaunchPad methodology and apply to design product, service, or app.
3. Develop a general understanding of the Business Model Canvas.
4. Develop experience applying scientific method to validate or invalidate hypotheses.
5. Develop experience working through the design process and develop novel design for target customer(s).
6. Develop experience presenting ideas and concepts in writing.
7. Learn and apply creative problem-solving techniques.

E T 481. Engineering Principles for Elementary Teachers**3 Credits (3)**

Introduction to hands-on engineering principles and projects useful for application in the Elementary classroom. Restricted to: Masters of Arts in Education in Elementary Mathematics and Science majors.

Learning Outcomes

1. An ability to engage in the problem-solving process within engineering applications.
2. An ability to put scientific theory into practice within an engineering application.
3. Knowledge of the use of engineering concepts with hands-on activities.
4. An ability to make sense of complex engineering-related phenomenon within an elementary school frame.

E T 482. Manufacturing Technology**3 Credits (2+2P)**

Fundamentals of computer aided manufacturing (CAM) and computer numerical control (CNC) machining. Students will learn how to program several variants of CNC machines, using both G/M code programming and computer aided manufacturing software. Emphasis will be on the effective design of parts to be made on CNC machines along with a hands on lab to give students experience on CNC machines. Students will individually design, manufacture, and keep items such as keychains, bottle openers, LED clocks, ergonomic handles, and license plates. Students must be in senior level standing to enroll.

Prerequisite: A grade of C- or better in both, E T 210 and E T 217.

Learning Outcomes

1. Various

E T 483. Mobile App Programming and Development**3 Credits (3)**

Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development.

Prerequisite: A grade of C- or better in both, ICT 152 and (E T 377 or ICT 377)), or Consent of Instructor.

Learning Outcomes

1. The student will learn to create a modern and flexible mobile device User Interface using Java
2. The student will develop a high functioning prototype their mobile app
3. The student will implement a business model canvas including development of a customer value proposition and a minimum of one round of customer discovery
4. The student will implement database and information storage using a mobile device
5. The student will implement the developer's dashboard for their mobile app
6. Student will publish and monetize their mobile app

E T 485. White Hat System Testing**3 Credits (3)**

System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation.

Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.

Learning Outcomes

1. The student will practice modern methods for penetration testing
2. The student will demonstrate advanced ethical hacking methods
3. The student will evaluate in-place security systems
4. The student will run-through simulated attacks and system break-ins
5. The student will learn to prepare detailed reports on system vulnerabilities and weaknesses

E T 490. Selected Topics**1-3 Credits**

Selected topics in engineering technology and related areas.

Prerequisite: consent of instructor.

E T 505. Special Topics in Information Technology**3 Credits (3)**

Contemporary topics in Information Technology Restricted to: M-IT majors. May be repeated up to 9 credits.

Learning Outcomes

1. Various

E T 539. Advanced Enterprise Security**3 Credits (3)**

This course provides the student with an overview of enterprise cybersecurity and a foundation for understanding the critical issues of protecting digital and information assets. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate an understanding of information security concepts and risk management.
2. Demonstrate an understanding of Intrusion Detection and Prevention Systems and Other Security Tools.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

E T 551. Enterprise Architecture I**3 Credits (3)**

A study of current enterprise architecture methodologies, tools, and techniques. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate the ability to utilize and develop architectural enterprise artifacts.
2. Assess multiple enterprise architecture methodologies.
3. Demonstrate IT architecture landscaping capability.
4. Assess integrating IT initiatives utilizing the enterprise architecture processes.

E T 552. Enterprise Architecture II**3 Credits (3)**

Advanced topics in enterprise architecture including availability, access, and architecture map development. Restricted to: M-IT majors.

Prerequisite: A grade of C- or better in E T 551.

Learning Outcomes

1. Demonstrate the differences and similarities in multiple enterprise architectures.
2. Demonstrate the ability for independent research on enterprise architectures.
3. Assess architectural artifacts for impact on IT planning and implementation.

E T 555. Virtualization**3 Credits (3)**

An analysis and review of system and IT virtualization techniques.

Restricted to: M-IT majors.

E T 562. Development and Operations**3 Credits (3)**

Software development including Python scripting. Operations programming. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate a basic knowledge of Operations Management and it's relationship to DevOps.
2. Demonstrate knowledge in current software used in DevOps.
3. Apply DevOps practices to a software deployment workflow.
4. Demonstrate the ability to define a Continuous Integration pipeline with automated testing.
5. Students will apply the continuous feedback principles to project monitoring.
6. Apply best practices to build security into DevOp projects.

E T 577. Advanced Computer Networking**3 Credits (3)**

Advanced networking design and analysis. Modernization of infrastructures. Restricted to: M-IT majors.

E T 583. Mobile App Programming and Development**3 Credits (3)**

Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development. Restricted to: M-IT majors.

E T 585. White Hat System Testing**3 Credits (3)**

System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation. Restricted to: M-IT majors.

Learning Outcomes

1. Describe cryptology.
2. Identify common information-gathering tools and techniques.
3. Perform system hacking, and web and database attacks.
4. Analyze vulnerabilities exploited by hackers.
5. Identify common types of malware and the threats they pose.
6. Perform network traffic analysis and sniffing by using appropriate tools.
7. Identify security controls and defensive technologies.

E T 595. Capstone Projects in Information Technology**3 Credits (3)**

Capstone course. Practical application of student's cumulative Information Technology knowledge to an assigned design projects. Project management skills.

Learning Outcomes

1. Demonstrate ability to manage complex work-related IT technical projects.
2. Demonstrate the ability to create an IT engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project timeline.
4. Demonstrate the ability to work in teams and execute project.
5. Demonstrate advanced project goal setting, skills assessment, and weekly updates.

Information and Communication Technology Courses

ICT 141. IT Essentials I: A+ Certification Training Focused on the Hardware Exam**3 Credits (3)**

Installing, configuring, troubleshooting, and maintaining personal computer hardware components and will assist in preparation for the CompTIA A+ Hardware certification.

Learning Outcomes

1. Configure and support PC, mobile, and IoT device hardware.
2. Perform basic computer diagnostic and maintenance operations.
3. Implement basic data backup and recovery methods.
4. Apply basic hardware maintenance best practices.
5. Demonstrate baseline security practices for hardware.

ICT 145. Network Essentials: N+ Certification Training**3 Credits (3)**

Focuses on the installation and administration of network communication systems and will assist in preparation for the CompTIA N+ Network certification.

Learning Outcomes

1. Explain basic networking concepts including network services, physical connections, topologies, and architecture.
2. Explain security concepts and network attacks in order to harden networks against threats.
3. Explain routing technologies and networking devices; deploy Ethernet solutions and configure wireless technologies.
4. Troubleshoot common cable, connectivity, and software issues related to networking.
5. Monitor and optimize networks to ensure business continuity.

ICT 152. Java Programming**3 Credits (3)**

Programming in the Java language.

Learning Outcomes

1. Set up a rich programming environment.
2. Analyze existing code.
3. Create/modify/debug/test programs.
4. Employ software documentation and programming best practices.

ICT 161. IT Essentials II: A+ Certification Training focused on the Software exam**3 Credits (3)**

Installing, configuring, troubleshooting, and maintaining personal computer operating systems and will assist in preparation for the CompTIA A+ Software certification.

Prerequisite: A grade of C- or better in ICT 141.

Learning Outcomes

1. Configure device operating systems, including Windows, Mac, Linux, Chrome OS, Android, and iOS.
2. Administer client-based and cloud-based software.
3. Troubleshoot and problem-solve core service and support challenges.
4. Apply best practices for documentation, change management, and scripting.
5. Support basic IT infrastructure and networking.

ICT 220. Discrete Math and Its Relationship to Information Technology**3 Credits (3)**

Focuses on developing software coding skills using a programming language and its application to discrete mathematics, the use discrete structures in computer science. Topics included are logic, sets, relations, functions, methods of proof, recursion, combinatorics, graph theory, and algorithms

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Corequisite: ICT 152.

Learning Outcomes

1. Explain the relationship between discrete math sets and coded arrays, finite and infinite, subsets, intersection, unions, and other set operations.
2. Explain binary Trees and know how to use demonstrate them using code.
3. Demonstrate the use of code applied to group and subgroup theory.
4. Demonstrate the use of code to create functions and algorithms.
5. Identify and explain logical operations and their application in coding.
6. Demonstrate the use of Probability Theory in code to predict random outcomes.

ICT 267. Information Security+ Certification Preparation**3 Credits (3)**

The course covers the Sec+ exam objectives and detailed preparation for certification in information security.

Prerequisite: A grade of C- or better in both, ICT 141 and ICT 145.

Learning Outcomes

1. The student will select appropriate mitigation and deterrent techniques to address network attacks and vulnerabilities.
2. The student will examine how access control, identity management, and cryptography can secure a network and manage risk.
3. The student will identify privacy and policy issues.
4. The student will apply activities that an Information Systems Security specialist would normally carry out in the performance of his/her duties.

ICT 280. Introduction to Web Development**3 Credits (3)**

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works.

Learning Outcomes

1. Explain the Document Object Model of HTML5 web pages.
2. Organize web page contents with Lists, figures, and organizational elements.
3. Develop web page layout templates.
4. Implement style application inline, via style blocks, and using external resources.
5. Develop and apply javascript event-driven programming to web pages.
6. Explain the difference between client and server-side scripting and data processing.

ICT 300. Special Topics**3 Credits (3)**

Directed study or project. Students must be in Junior standing and have the consent of department head to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Various.

ICT 320. Introduction to Internet Protocols**3 Credits (3)**

Present a overview of Internet Protocols Applications. Students must be in Junior or Senior standing only.

Learning Outcomes

1. Students will apply an understanding of basic Networking.
2. Students will employ effective use of Packet analysis software to troubleshoot network issues.
3. Explain the RFC process for developing network protocols.
4. Explain network protocol security implications.

ICT 339. Introduction to Digital Forensics and Incident Response**3 Credits (3)**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.

Prerequisite: A grade of C- or better in ICT 360.

Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

ICT 350V. Introduction to Personal Computer Security and Privacy
3 Credits (3)

Introduction to Information Security and Privacy – Have you ever wondered what happens to all of your browsing history or data you fill out on websites go? Who has this data? What do they do with this data? How do you stop sharing your private information? This class will answer those questions and provide steps to make your online presence more secure.

Learning Outcomes

1. Classify security issues
2. Classify Privacy protections
3. Evaluate threats and countermeasures based on personal security breaches.
4. Formulate a real-time privacy response
5. Assess international privacy protections through a multicultural focus.

ICT 352. Software Technology I**3 Credits (3)**

This course focuses on reading, writing, debugging, testing, and documenting computer programs. May be repeated up to 3 credits.

Learning Outcomes

1. Set up a rich programming environment
2. Analyze existing code
3. Create/modify/debug/test programs
4. Employ software documentation and programming best practices

ICT 355. Linux System Administration**3 Credits (3)**

Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup, and Maintenance of Linux Servers.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 360. Operating Systems for ICT**3 Credits (3)**

Fundamentals of operating systems with Windows and Linux including installation and configuration using the GUI as well as the command line, text editors, file systems, scripting and operating system management.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Create multiple Operating Systems in a Virtual Environment.
3. Manage error codes in Virtual Machines.
4. Support the operation of the CentOS GUI and Windows Operating Systems.

ICT 362. Software Technology II**3 Credits (3)**

Topics include problem analysis, object-oriented programming (OOP), structured logic, and development concepts. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in ICT 152 or ICT 352 or E T 262 or OECS 195 or C S 152 or C S 172.

Learning Outcomes

1. Set up and use a rich programming environment for programming with Python.
2. Analyze existing code.
3. Employ effective use of basic programming and basic troubleshooting.
4. Employ effective use of Object-Oriented Programming (OOP) and troubleshooting.
5. Apply testing and documentation best practices.

ICT 364. Windows Enterprise Administration**3 Credits (3)**

Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.

Prerequisite: A grade of C- or better in ICT 352 or E T 262 or OECS 195 or C S 152 or C S 172.

Learning Outcomes

1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational Structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPvfour and IPvsix.
4. Analyze existing cmd shell and PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-domain trust relationship.
7. Employ effective use of the WDS service to deploy template images.

ICT 372. Software Engineering and Design**3 Credits (3)**

Topics include the software development lifecycle, problem analysis, and implementing software testing routines to improve the quality, integrity, and security of code.

Prerequisite: A grade of C- or better in ICT 362.

Learning Outcomes

1. Identify, explain, and apply the phases of the SDLC.
2. Identify different Agile methodologies and practices for software project management.
3. Use different development tools and apply best practices.
4. Apply best practices in the creation of business objects, data storage and access, testing, and debugging.
5. Configuring, handling, testing, and deploying services.

ICT 377. Computer Networking I**3 Credits (3)**

Computer network design and applications for LAN, TCP/IP networks, routing and switching technologies, VLANs, and the OSI layers from physical to transport.

Prerequisite/Corequisite: A grade of C- or better MATH 1220G or higher.

Learning Outcomes

1. Define and distinguish the role of a network administrator (from other roles in the IT world).
2. Identify the OSI model, its layers, and the relationship to the TCP/IP model.
3. Identify different cable media and networking devices and their use.
4. Design, configure and troubleshoot basic networks.
5. Identify MAC, IPvfour, and IPvsix addressing.
6. Apply different techniques for IP allocation and subnet design (IPvfour).
7. Use the Cisco IOS software for basic switch and router configurations.
8. Configure and troubleshoot basic setup for static and dynamic routing protocols.

ICT 380. Web Design and Multimedia**3 Credits (3)**

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.

Learning Outcomes

1. Create multiple front-end development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

ICT 400. Special Topics**1-3 Credits (1-3)**

Directed study or project. Students must be in Senior standing and have the consent of department head to enroll. May be repeated up to 6 credits.

Learning Outcomes

1. Various.

ICT 435. Senior Project**3 Credits (3)**

Capstone course. Practical application of student's cumulative knowledge to an assigned design project. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required. Restricted to ICT Majors.

Prerequisite: A grade of C- or better in the following: ICT 364 and ICT 377 and (ICT 462 or ICT 355).

Learning Outcomes

1. Demonstrate ability to manage a complex technical project.
2. Demonstrate the ability to create an engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project.
4. Demonstrate the ability to work in teams and execute project.
5. Goal setting, skills assessment and portfolio development included.

ICT 439. Advanced Digital Forensics and Incident Response**3 Credits (3)**

Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.

Prerequisite: A grade of C- or better in both, (E T 339 or ICT 339) and (E T 377 or ICT 377).

Learning Outcomes

1. Demonstrate the use of forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
2. Demonstrate proper incident response procedures and proper chain of custody when handling digital evidence.
3. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
4. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

ICT 450. Ethical Hacking**3 Credits (3)**

Ethical Hacking and Penetration testing techniques. Students must be in senior standing to enroll.

Prerequisite: A grade of C- or better in ICT 350V.

Learning Outcomes

1. Analyze networking concepts as they relate to hacking vulnerabilities.
2. Define contract requirements necessary to avoid legal liability during Ethical Hacking.
3. Employ tools and techniques to scan and do reconnaissance on potential targets.
4. Demonstrate use of vulnerability testing tools to identify vulnerabilities and exploits.
5. Identify the role of sniffers and session Hijacking in Ethical Hacking.
6. Demonstrate the use of Social Engineering tools and techniques used in Ethical Hacking.

ICT 457. Introduction to Information Security Technology**3 Credits (3)**

This course provides an overview of security challenges and strategies of countermeasure in the information systems environment. Topics include definition of terms, concepts, elements, and goals incorporating industry standards and practices with a focus on availability, vulnerability, integrity and confidentiality aspects of information systems.

Learning Outcomes

1. Demonstrate an understanding of the information security concepts.
2. Demonstrate an understanding of the diversity of potential attacks against an organization.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

ICT 458. Web Development and Database Applications**3 Credits (3)**

Design, planning, and building of interactive and dynamic web applications. Topics include relational databases, object oriented programming, and web security.

Prerequisite/Corequisite: ICT 362.

Learning Outcomes

1. Setting up a development server.
2. Read, design, and write code for backend web dev.
3. Design, create, and access databases that support web applications.
4. Implement effective security and authentication on Web applications.

ICT 460. Multimedia Tools and Support**3 Credits (3)**

Introduction to video, audio and other digital presentation methods. Addresses the latest multimedia technology advances and how they apply to the information and communication technology fields. Sample tools like ffmpeg, and Audacity are covered. Students must be in senior standing to enroll.

Prerequisite: A grade of C- or better in ICT 360.

Learning Outcomes

1. To understand the concepts related to Multimedia, Digital footprint, and Computer Graphics.
2. To become familiar with visual design basics and know the requirements for typography and logo design.
3. To learn about the concept of sound signals, digital file formats for sound and multimedia sound systems.
4. To perform digital audio editing, audio clip introduction and podcast creation.
5. To create, edit and add effects to digital video podcast, intros, and trailers.
6. To learn about Website creation and its significance in the current multimedia trends.
7. To become familiar with content curation, social media, blogs and how to create them.
8. To integrate all concepts covered in the course into an informative/ educational website.

ICT 462. Linux System Administration**3 Credits (3)**

Operating system applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 463. Enterprise Linux Administration**3 Credits (3)**

Advanced Linux Includes an advanced look at the use of Coding repositories, Linux-based containers, virtual machines, and scripting tools including Dockerfiles, Vagrantfiles, and Ansible. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in (ICT 355 or ICT 462).

Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrastructure management software to deploy defined roles in multiple environments.

ICT 467. Communication Network Security**3 Credits (3)**

The course provides a technical perspective on maintaining the security of communication network systems. It covers a wide range of technical issues, including wired, wireless and Internet communication fundamentals, communication network security mechanisms and configuration, standards and protocols, vulnerabilities, attacks and countermeasures.

Prerequisite: A grade of C- or better in both, ICT 320 and ICT 377.

Learning Outcomes

1. Demonstrate an understanding of key and basic communication network security concepts, terminologies, standards, issues, and policies.
2. Apply the principles of network security techniques such as Cryptography, Cryptanalysis, Biometrics, Watermarking, and Stenography.
3. Implement security techniques with commonly available network security software.
4. Examine the fundamentals of Wired and Wireless communication network systems including Cellular, Bluetooth, Wi-Fi, Internet, Cloud Networking, and the Internet of Things.
5. Explain the TCP/IP security protocols that pertain to communication network systems.
6. Explain the security attacks, threats, risks, mechanisms, and tools associated with and used for securing network devices especially mobile devices.
7. Demonstrate an understanding of the operation and countermeasures against Malwares in network systems and the implementation of intrusion detection and prevention, and firewall technologies.

ICT 477. Computer Networking II**3 Credits (3)**

Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security as well as network monitoring.

Prerequisite: A grade of C- or better in either ICT 377 or E T 377 or CTEC 285.

Learning Outcomes

1. VLSM, Summarization, and the TCP/IP model.
2. Understanding of IPv6 basics
3. Configuration of routing protocols using IPv6
4. Configuration of advanced router configurations
5. Configuration of route redistribution, DHCP, DNS, NAT and PAT
6. Configure network security and Access Control Lists (ACLs)
7. Perform basic analysis of network data traffic
8. Create, test and troubleshoot software simulations (Cisco Packet Tracer)

ICT 487. Data Security**3 Credits (3)**

This course explores the principles of information assurance, with emphasis on current threats and vulnerabilities to develop an information security plan to mitigate risk. Information security and assurance issues are explored, and a multidisciplinary approach is discussed that examines security policies, models, and mechanisms for confidentiality, integrity, and availability. Technical controls are emphasized.

Prerequisite: A grade of C- or better in both, ICT 320 and ICT 360.

Learning Outcomes

1. Demonstrate a basic understanding of security risk management.
2. Demonstrate basic cryptographic functionality, including symmetric ciphers, public-key encryption, digital signatures, hash functions, and related concepts.
3. Examine how basic cryptographic building blocks are combined to meet high-level security goals in protocols like SSL and IPsec.
4. Justify the use of particular technologies, settings, and parameters to meet specified security goals.
5. Evaluate the security of systems that use cryptography and secure communication techniques.
6. Explain how privacy issues can impact system design.

Surveying Engineering Courses**SUR 143. Civil/Survey Drafting I****3 Credits (2+2P)**

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic mapping, contour drawings, plan, and profiles as street/highway layout. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 109 or DRFT 109.

Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil 3D software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting and trigonometry is required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.

SUR 222. Introduction to Geomatics**3 Credits (2+3P)**

Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping.

Prerequisite: A grade of C- or better in MATH 1250G or higher.

Learning Outcomes

1. Perform basic distance and angular measurements.
2. Evaluate the quality of collected measurements.
3. Utilize a measuring tape.
4. Determine a plumb line.
5. Set up a level line.
6. Set up a tripod and total station.
7. Utilize a plumb rod.
8. Understand the role of surveying in civil engineering and construction-related fields.
9. Understand new technologies in surveying.

SUR 285. Precise Digital Mapping**3 Credits (3)**

Photogrammetric Mapping Principles, digital sensor including optical cameras, terrestrial, surveying control, IMU & GPS integration, stereo photography, analytical triangulation, orthorectification, precision and accuracy of measurement systems, sUAS (Small Unmanned Aerial Vehicles) applications to geospatial data collection and practical applications project flight/pre planning, sensor platform, FAA regulations and restrictions, introduction to laser scanning systems. Restricted to Las Cruces campus only.

Learning Outcomes

1. Understand the basic principles of photogrammetry.
2. Perform photo measurements and computation.
3. Be able to design aerial surveying projects.
4. Define the basic principles of analytical photogrammetry.
5. Explain the different steps in aerial triangulation.

SUR 292. Legal Principles and Boundary Law I**3 Credits (3)**

Fundamentals of real property law; principles of land description; survey evidence and procedure in boundary determination, order of importance of conflicting elements; and liability, ethical and professional principles in boundary surveying; contemporary issues in boundary determination.

Learning Outcomes

1. Understand how the USPLSS was developed and used
2. Be able to locate and identify USPLSS survey monuments
3. Be able to apply single and double proportion methods
4. Be able to subdivide USPLSS sections
5. Be able to read, write and interpret USPLSS legal descriptions

SUR 312. Public Land Survey System Boundaries**3 Credits (3)**

Fundamentals of the U.S. Public Land Survey System; rules for the survey of the public lands, field surveys; the rectangular system, corners, monuments, evidence; dependent and independent resurveys, corner restoration; plats and field notes, patents.

Learning Outcomes

1. Demonstrate an understanding of surveying boundary laws
2. Describe procedures for locating real property boundaries
3. Read, interpret and write legal descriptions of real property
4. Perform legal research of case and statutory law
5. Communicate research findings through written and oral presentation

SUR 328. Construction Surveying & Automation Technologies**3 Credits (2+3P)**

Construction Surveying Principles: conventional and machine controlled. Layout alignments, grades, various infrastructure, buildings. Understand error identification, common quality control checks and blunder identification. Alignments and station/off set, types of construction layout of infrastructure: roads, bridges, utilities (including subsurface), buildings, industrial; reading and interpreting construction plans, data management, horizontal, vertical and spiral curves, slope staking, machine control basics, applications and data managements. Use of electronic files and liability issues. Layout alignments, grades, various infrastructure, buildings. Ability to understand data integration in automated machine control, work flow processes.

Prerequisite: A grade of C- or better in both, (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G).

Learning Outcomes

1. Acquire the ability to answer test questions on professional surveying exams.
2. Develop the ability to appropriately collect, analyze, interpret and apply surveying and surveying-related data.
3. Develop the ability to recognize, analyze, and solve surveying and surveying-related problems.
4. Develop the ability to work on teams.

SUR 330. Computer Applications of Surveying**3 Credits (2+3P)**

Advanced application of concepts and tools used in the manipulation of geospatial data in a computer environment. Topics include the use of surveying-specific software applications for problem solving, analysis and generation of spatial data products. Advanced programming skills in a high level language are presented and applied. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in the following: (E T 109 or DRFT 109) and SUR 222, and (MATH 1435 or MATH 1511G), and (E T 262 or ENGR 140).

Learning Outcomes

1. Various

SUR 351. Spatial Data Adjustment I**3 Credits (3)**

Theory of random error in observations/measurements. Use of statistics in spatial data analysis, statistical testing, advanced data structures. Emphasis on computer based problem solving and programming to solve spatial data problems.

Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G) and (A ST 311G or MATH 1350G).

Learning Outcomes

1. Acquire the ability to answer questions on professional surveying exams.
2. Acquire a sound and fundamental understanding of the mathematical principles underlying surveying measurements and computations.
3. Develop the ability to appropriately analyze, interpret, and apply survey and survey-related data.
4. Develop the ability to recognize, analyze, and solve survey and survey-related problems.

SUR 361. Geodesy/Geodetic Control Surveying**3 Credits (3)**

Horizontal and vertical control network design and consideration. Understand ellipsoid, geoid, horizontal and vertical datum, coordinates, precise leveling, astronomic, establishment of state plane zones, understanding reporting. Transform data between geodetic Latitude/Longitude, state plane, ground data, perform geodetic computations, ability to design GPS networks utilizing CORS stations, network adjustments. Perform a control survey, process data, adjust network, and prepare control report with Meta-data.

Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G).

Learning Outcomes

1. Define the different coordinate systems and geometric models used to represent the shape of the Earth.
2. Be able to perform surveying computations on the sphere and ellipsoid.
3. Distinguish between the different map projections systems.
4. Explain the effects of gravity in survey measurements, especially in precise leveling.
5. Outline how earth motions affect surveying measurements and the different time systems.
6. Explicitly indicate which of the student outcomes listed in Criterion III or any other outcomes are addressed by the course.

**SUR 401. Ethics and Professionalism in Surveying and Mapping
3 Credits (3)**

Ethics as applied to the surveying profession. Includes case studies and problems.

Prerequisite: .

Learning Outcomes

1. An ability to communicate effectively with a range of audiences.
2. An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

**SUR 412. Advanced Topics in Boundary Surveying
3 Credits (2+3P)**

Advanced land boundary topics including water boundaries, mineral claims, Spanish and Mexican land grants, state and national boundaries. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in SUR 312.

Learning Outcomes

1. Identify land boundary topics

**SUR 450. Senior Project
3 Credits (3)**

Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education. Students must be in Senior Standing to enroll.

Learning Outcomes

1. An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2. An ability to formulate or design a system, process, procedure or program to meet desired needs.
3. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.

**SUR 451. Spatial Data Adjustment II
3 Credits (3)**

Rigorous analysis of the theory of observations as applied to spatial data, application of least squares adjustments, ability to perform statistical analysis to determine accuracy of final product, constrained/free geospatial data integration, error ellipses, and pre-analysis of spatial data acquisition procedures.

Prerequisite: A grade of C- or better in SUR 351.

Learning Outcomes

1. Understand the theory of least squares as applied to survey measurements
2. Understand the relevance of weighting survey observations
3. Be able to adjust vertical, horizontal and 3D networks by least squares
4. Be able to transform coordinates between similar coordinate systems
5. Be able to analyze survey errors and detect survey blunders

**SUR 452. Spatial Data Integration and Analysis
3 Credits (3)**

Surveying practice under the direction of a licensed, professional land surveyor requiring an approved number of hours. Planned work between the student and the surveyor should be designed to be part of a project that integrates spatial data. An individualized syllabus should be developed collaboratively with the industrial partner and approved by the geomatics faculty. The final deliverable must be certified by the licensed professional land surveyor. A written report by the student is required. Credit is given to past work experience in cases where students can demonstrate that requirements for the practicum are met and should be approved by geomatics faculty.

Learning Outcomes

1. Demonstrate a level of technical competency, based upon completing the requirements of a geomatics technology curriculum.
2. Students are expected to successfully and professionally complete a "real" project. Additionally, student work is employed to assess most of the program's outcomes for program assess.

**SUR 461. GNSS Positioning
3 Credits (2+3P)**

Logistics of GNSS data collection, the GPS signal, codes and biases, error sources, differences between relative and autonomous GNSS positioning, code phase carrier phase, DGPS static and RTK surveys. Geodetic and GPS standards and specifications GNSS data processing, network adjustments, and evaluation of spatial data accuracy practical applications of GNSS May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in SUR 361.

Learning Outcomes

1. Outline the relationship of geodesy to satellite positioning systems.
2. Describe the procedure of GNSS surveys.
3. Differentiate between different GNSS surveying techniques.
4. Identify GPS standards and specifications.

**SUR 464. Legal Principles and Boundary Law II
3 Credits (3)**

ALTA Surveys and Standards, boundary evidence, order of evidence, Subdivision and Platting Law, Mexican and Spanish land grants, water boundaries, sequential and simultaneous conveyances. Consent of Instructor required.

Prerequisite: A grade of C- or better in SUR 312.

Learning Outcomes

1. Understand and apply rules of evidence as applied to boundary surveys.
2. Understand the differences between original and retracement surveys.
3. Be able to interpret or write advanced legal descriptions.
4. Understand the role of professional liability in boundary surveying.
5. Understand advanced topics in the USPLSS.

SUR 485. Emerging Techniques in Geospatial Technologies**3 Credits (3)**

Hydrographic, Altimetry, Space borne Imaging Systems, Mobile Mapping Systems, Mining and Agriculture Surveying Principles, Ranging technologies and applications such as LiDAR, SAR, and Bathymetry. Principles of terrestrial & airborne laser scanning, point cloud data management & extraction, scan registration and processing, and advanced ranging data acquisition systems. Consent of Instructor required.

Prerequisite(s): Senior standing.

Learning Outcomes

1. Outline the different techniques in mapping seabed.
2. Describe the procedure of LIDAR mapping.
3. Outline the remote sensing technologies used in mapping.
4. Recognize the UAV mapping technologies.
5. Produce surveying products from new technologies in geomatics.

Department Contact Information

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Engineering Technology - Civil - Bachelor of Science in Engineering Technology

The Civil Engineering Technology (CET) Program at NMSU will prepare graduates with the technical and managerial skills necessary to enter careers in the planning, design, construction, and operation of the built environment and global infrastructure. Graduates with the baccalaureate degree have strengths in their knowledge of design, construction, testing, and operation of buildings and infrastructure with the ability to produce and utilize construction documents, analyze and design systems, specify project methods and materials, perform cost estimates and analyses, and manage technical activities in support of civil projects. Graduates from our ABET-accredited CET program can pursue professional licensure and become professional engineers.

Program Educational Objectives

1. graduates are competent in at least one of the following areas:
 - a. Land Development
 - b. Infrastructure Development
 - c. Heavy Civil Construction
 - d. Cost Estimating
 - e. Characterization and mechanical properties of construction materials.
2. graduates are proficient in the assessment of Engineering Alternatives.
3. graduates are:
 - a. meeting the engineering needs of the region, both in the government and private sectors
 - b. leaders in their specialized field of endeavor
4. graduates are pursuing their professional registration (Professional Engineer License)

The Civil Engineering Technology program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information/>) by the Engineering Technology Accreditation Commission (ETAC) of ABET www.abet.org (<http://www.abet.org/>)

Concentrations

- Renewable Energy Technologies (p. 1027)

Minors

- Renewable energy (p. 1053)
- Geomatics (p. 1052)

Types of jobs that graduates pursue in this field

- Civil Engineer
- Construction Manager
- Project Engineer
- Project Manager
- Design Engineer
- Construction Inspector
- Owner
- Estimator
- Distribution and Sales

Engineering Technology - Civil (No Concentration)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		4
ENGL 1110G	Composition I	
<i>English Composition - Level 2</i>		3
ENGL 2210G	Professional & Technical Communication	
<i>Oral Communication</i>		3
COMM 1115G	Introduction to Communication	

Area II: Mathematics

MATH 1511G	Calculus and Analytic Geometry I ¹	3-4
or MATH 1435	Applications of Calculus I	

Area III: Laboratory Sciences 8

CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
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Choose one sequence from the following for four credits:

PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	

Area IV: Social/Behavioral Sciences ² 3**Area V: Humanities** ² 3**Area VI: Creative and Fine Arts** ² 3**General Education Elective**

MATH 1521G	Calculus and Analytic Geometry II ¹	3-4
or MATH 1440	Applications of Calculus II	

Viewing A Wider World ^{3,4} 6**Departmental/College Requirements**

A ST 311	Statistical Applications	3
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil Drafting Fundamentals	3
E T 154	Construction Methods and Communications	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
I E 451	Engineering Economy	3
SUR 222	Introduction to Geomatics	3

Geomatics/Surveying Elective (choose 1 course from the list below) 3

SUR 328	Construction Surveying & Automation Technologies	
SUR 351	Spatial Data Adjustment I	
SUR 361	Geodesy/Geodetic Control Surveying	

Technical Electives (choose 3 courses from the list below) ⁴ 9

E T 381	Renewable Energy Technologies	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
E T 472	Intelligent Transportation Systems (ITS)	

Second Language: (not required)**Electives, to bring the total credits to 123****0****Total Credits** 123-125

¹ Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Concentrations are "optional" educational sequences that students may chose to focus on particular areas related to CET. Concentrations may often be done without additional credits by judicious use of electives and other optional course requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGL 1110G	Composition I	4
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 154	Construction Methods and Communications	3
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
Credits		16

Spring

E T 109	Computer Drafting Fundamentals	3
MATH 1435 or MATH 1511G	Applications of Calculus I ¹ or Calculus and Analytic Geometry I	3-4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
Area III: Lab Sciences (Choose one)		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Credits		14-15

Second Year

Fall		
COMM 1115G	Introduction to Communication	3
E T 143	Civil Drafting Fundamentals	3
ENGL 2210G	Professional & Technical Communication	3
ENGR 233	Engineering Mechanics I	3

MATH 1440 or MATH 1521G	Applications of Calculus II ¹ or Calculus and Analytic Geometry II	3
Credits		15
Spring		
Area IV: Social Behavior Sciences ²		3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
ENGR 234	Engineering Mechanics II	3
SUR 222	Introduction to Geomatics	3
Credits		16
Third Year		
Fall		
Area V: Humanities ²		3
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 354	Soil and Foundation Technology	4
Viewing a Wider World ³		3
Credits		14
Spring		
Area VI: Creative and Fine Arts ²		3
E T 332	Applied Design of Structures I	4
E T 355	Site/Land Development and Layout	3
Surveying Elective Course (from pre-approved list) ⁴		3
Technical Elective Course (from pre-approved list) ⁵		3
Credits		16
Fourth Year		
Fall		
A ST 311	Statistical Applications	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
I E 451	Engineering Economy	3
Technical Elective Course (from pre-approved list) ⁵		3
Credits		16
Spring		
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
Technical Elective Course (from pre-approved list) ⁵		3
Viewing a Wider World ³		3
Credits		16
Total Credits		123-124

¹ Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

² See the General Education (p. 220) section of this catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of this catalog for a full list of courses

⁴ **Surveying Electives:** SUR 328 Construction Surveying & Automation Technologies, SUR 351 Spatial Data Adjustment I, or SUR 361 Geodesy/Geodetic Control Surveying

⁵ **Technical Elective Courses:** E T 381 Renewable Energy Technologies, E T 382 Solar Energy Technologies, E T 384 Wind and Water Energy Technologies, E T 386 Sustainable Construction and Green Building Design, E T 472 Intelligent Transportation Systems (ITS), E T 480 Innovation and Product Development, and any SUR 300+ (in addition to the required Surveying Elective).

Engineering Technology - Civil (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology

Students must complete all university degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		3
COMM 1115G	Introduction to Communication	
<i>Area II: Mathematics</i>		
MATH 1511G or MATH 1435	Calculus and Analytic Geometry I ¹ Applications of Calculus I	3-4
<i>Area III: Laboratory Sciences</i>		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
Choose one sequence from the following for four credits:		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences</i> ²		3
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1440	Calculus and Analytic Geometry II ¹ Applications of Calculus II	3-4
Viewing A Wider World ³		6
Departmental/College Requirements		
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil Drafting Fundamentals	3

E T 154	Construction Methods and Communications	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
SUR 222	Introduction to Geomatics	3
or DRFT 222	Introduction to Geomatics	
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
I E 451	Engineering Economy	3
A ST 311	Statistical Applications	3
Concentration Coursework		
E T 381	Renewable Energy Technologies	3
E T 382	Solar Energy Technologies	3
or E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	3
SUR 328	Construction Surveying & Automation Technologies	3
Second Language: (not required)		
Electives, to bring the total credits to 120		0
Total Credits		123-125

¹ For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements.

Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.

**for either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.*

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ENGL 1110G	Composition I	4
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 154	Construction Methods and Communications	3
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
Credits		16
Spring		
E T 109	Computer Drafting Fundamentals	3
MATH 1435 or MATH 1511G	Applications of Calculus I ¹ or Calculus and Analytic Geometry I	3-4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
Physics I with Lab (Area III: Lab Sciences, Choose one)		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Credits		14-15
Second Year		
Fall		
E T 143	Civil Drafting Fundamentals	3
ENGR 233	Engineering Mechanics I	3
MATH 1440 or MATH 1521G	Applications of Calculus II ¹ or Calculus and Analytic Geometry II	3-4
ENGL 2210G	Professional & Technical Communication	3
COMM 1115G	Introduction to Communication	3
Credits		15-16
Spring		
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
SUR 222	Introduction to Geomatics	3
ENGR 234	Engineering Mechanics II	3
Area IV: Social Behavior Sciences ²		3
Credits		16
Third Year		
Fall		
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 354	Soil and Foundation Technology	4
Viewing a Wider World ³		3
Area V: Humanities ²		3
Credits		14
Spring		
E T 332	Applied Design of Structures I	4
E T 355	Site/Land Development and Layout	3
E T 382	Solar Energy Technologies	3
SUR 328	Construction Surveying & Automation Technologies	3
Area VI: Creative and Fine Arts ²		3
Credits		16
Fourth Year		
Fall		
A ST 311	Statistical Applications	3

E T 432	Applied Design of Structures II	4
E T 381	Renewable Energy Technologies	3
E T 386	Sustainable Construction and Green Building Design	3
E T 459	Construction Technology and Management	3
Credits		16
Spring		
I E 451	Engineering Economy	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
Viewing a Wider World ³		3
Credits		16
Total Credits		123-125

¹ Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

² See the General Education (p. 220) section of this catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Engineering Technology - Civil (Transportation Technology) - Bachelor of Science in Engineering Technology

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I	
<i>English Composition - Level 2</i>		3
ENGL 2210G	Professional & Technical Communication (Recommended)	
<i>Oral Communication</i>		3
COMM 1115G	Introduction to Communication (Either Recommended)	

or HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ¹	3-4
or MATH 1435	Applications of Calculus I	
<i>Area III: Laboratory Sciences</i>		8
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
Choose one sequence from the following for four credits:		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences²</i>		3
<i>Area V: Humanities²</i>		3
<i>Area VI: Creative and Fine Arts²</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II ¹	3-4
or MATH 1440	Applications of Calculus II	
Viewing A Wider World³		6
Departmental/College Requirements		
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil Drafting Fundamentals	3
E T 154	Construction Methods and Communications	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
SUR 222	Introduction to Geomatics	3
or DRFT 222	Introduction to Geomatics	
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
I E 451	Engineering Economy	3
A ST 311	Statistical Applications	3
<i>Concentration Coursework</i>		
C E 479	Pavement Analysis and Design	3
E T 455	Cost Estimating and Scheduling	3
E T 472	Intelligent Transportation Systems (ITS)	3
SUR 328	Construction Surveying & Automation Technologies	3
Second Language: (not required)		
Electives, to bring the total credits to 120		0
Total Credits		123-125

¹ For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements.

Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.

**for either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.*

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ENGL 1110G	Composition I	4
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 154	Construction Methods and Communications	3
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
Credits		16
Spring		
E T 109	Computer Drafting Fundamentals	3
MATH 1511G or MATH 1435	Calculus and Analytic Geometry I ¹ or Applications of Calculus I	3-4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
Physics I with Lab (Area III: Lab Sciences, Choose one) ³		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Credits		14-15

Second Year

Fall		
E T 143	Civil Drafting Fundamentals	3
MATH 1440 or MATH 1521G	Applications of Calculus II ¹ or Calculus and Analytic Geometry II	3-4
ENGR 233	Engineering Mechanics I	3
ENGL 2210G	Professional & Technical Communication	3
COMM 1115G	Introduction to Communication	3
Credits		15-16
Spring		
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
SUR 222	Introduction to Geomatics	3

ENGR 234	Engineering Mechanics II	3
Area IV: Social Behavior Sciences ²		3
Credits		16
Third Year		
Fall		
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 354	Soil and Foundation Technology	4
Viewing a Wider World ³		3
Area V: Humanities ²		3
Credits		14
Spring		
E T 332	Applied Design of Structures I	4
E T 355	Site/Land Development and Layout	3
SUR 328	Construction Surveying & Automation Technologies	3
E T 472	Intelligent Transportation Systems (ITS)	3
Area VI: Creative and Fine Arts ²		3
Credits		16
Fourth Year		
Fall		
A ST 311	Statistical Applications	3
I E 451	Engineering Economy	3
E T 432	Applied Design of Structures II	4
E T 455	Cost Estimating and Scheduling	3
E T 459	Construction Technology and Management	3
Credits		16
Spring		
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
C E 479	Pavement Analysis and Design	3
Viewing a Wider World ³		3
Credits		16
Total Credits		123-125

¹ Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

² See the General Education (p. 220) section of this catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Engineering Technology - Electronics and Computer - Bachelor of Science in Engineering Technology

The Electronics and Computer Engineering Technology (<https://et.nmsu.edu/electronics-and-computer-engineering-technology/>) (ECET) program includes the design, building, and testing of a wide range of electronic and computer circuits and systems, including hardware/software digital systems, microprocessor systems, analog circuits, renewable energy technologies, micro-controllers, communications devices, applied power systems, signal processing and filter circuits, instrumentation systems, and computer networks. Our program includes a diverse exposure to programming languages, as well as hardware description languages, such as VHDL.

The ECET program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information/>) by the Engineering Technology Accreditation Commission (ETAC) of ABET. www.abet.org (<http://www.abet.org/>).

Engineering Technology - Electronics and Computer (No Concentration)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication (Recommended) ²	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication	3
<i>Area II: Mathematics</i>		
MATH 1435	Applications of Calculus I ¹	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III: Laboratory Sciences</i>		
Choose a sequence from the following for eight credits: ³		8
<i>Algebra-Based Sequence</i>		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
<i>Calculus-Based Sequence</i>		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
<i>Area IV: Social/Behavioral Sciences</i> ²		3
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3

<i>General Education Elective</i>		
MATH 1440	Applications of Calculus II ¹	3-4
or MATH 1521G	Calculus and Analytic Geometry II	
Viewing A Wider World ^{2, 4}		6
Departmental/College Requirements		
A ST 311	Statistical Applications	3
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 246	Electronic Devices I	4
E T 272	Electronic Devices II	4
E T 314	Communications Systems I	3
E T 324	Signal Processing and Filtering	4
E T 344	Microprocessor Systems	3
E T 362	Software Technology II	3
E T 377	Computer Networking I	3
E T 381	Renewable Energy Technologies	3
E T 398	Digital Systems	4
E T 402	Instrumentation	3
E T 410	Senior Seminar	1
E T 444	Computer Hardware Senior Design	3
E T 456	Applied Power Technologies	4
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 230	AC Circuit Analysis	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
I E 451	Engineering Economy	3
<i>Technical Electives (choose 3 courses from the list below)</i> ⁴		9
E T 305	Introduction to Product Design	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
E T 472	Intelligent Transportation Systems (ITS)	
E T 480	Innovation and Product Development	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 457	Introduction to Information Security Technology	
Second Language: (not required)		
Electives, to bring the total credits to 123		
Total Credits		123-125

¹ Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

² See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#associatesbachelorsgetext>) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses, rules, and alternative options.

³ Students must select one of the two PHYS course sequences, from the following, in order to meet the 8 credits of the Area III: Laboratory Sciences requirement.

Algebra-Based Sequence

- PHYS 1230G Algebra-Based Physics I/PHYS 1230L Algebra-Based Physics I Lab
- PHYS 1240G Algebra-Based Physics II/PHYS 1240L Algebra-Based Physics II Lab

Calculus-Based Sequence

- PHYS 1310G Calculus -Based Physics I/PHYS 1310L Calculus -Based Physics I Lab
- PHYS 1320G Calculus -Based Physics II/PHYS 1320L Calculus -Based Physics II Lab

⁴ Minors are "optional" educational sequences that permit students to focus on particular areas related to their major. Minors "may" often be done with few additional credits by judicious use of electives and other optional course requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
COMM 1115G	Introduction to Communication (Area I: Communications) ²	3
E T 101	Introduction to Engineering Technology and Geomatics	1
ENGL 1110G	Composition I (Area I: Communications)	4
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
Credits		16
Spring		
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGL 2210G	Professional & Technical Communication (Area I: Communications)	3
MATH 1435 or MATH 1511G	Applications of Calculus I (Area II: Mathematics) ¹ or Calculus and Analytic Geometry I	3 - 4
Credits		14-15

Second Year

Fall		
E T 246	Electronic Devices I	4
ENGR 230	AC Circuit Analysis	4
MATH 1440 or MATH 1521G	Applications of Calculus II ¹ or Calculus and Analytic Geometry II	3 - 4

Physics I with Lab (Area III: Lab Sciences, Choose one) ³		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab ³	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab ³	
Credits		15-16
Spring		
Area IV: Social Behavior Sciences ²		3
E T 272	Electronic Devices II	4
E T 362	Software Technology II	3
E T 398	Digital Systems	4
Physics II with Lab (Area III: Lab Sciences, from the chosen sequence) ³		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ³	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab ³	
Credits		18
Third Year		
Fall		
Area V: Humanities ²		3
E T 324	Signal Processing and Filtering	4
E T 377	Computer Networking I	3
E T 381	Renewable Energy Technologies	3
Technical Elective Course (from pre-approved list) ⁴		3
Credits		16
Spring		
A ST 311	Statistical Applications	3
E T 314	Communications Systems I	3
E T 344	Microprocessor Systems	3
Technical Elective Course (from pre-approved list) ⁴		3
Viewing a Wider World ^{2, 4}		3
Credits		15
Fourth Year		
Fall		
E T 402	Instrumentation	3
E T 444	Computer Hardware Senior Design	3
ENGR 401	Engineering Capstone I	3
I E 451	Engineering Economy	3
Area VI: Creative and Fine Arts ²		3
Credits		15
Spring		
E T 410	Senior Seminar	1
E T 456	Applied Power Technologies	4
ENGR 402	Engineering Capstone II	3
Technical Elective Course (from pre-approved list) ⁴		3
Viewing a Wider World ^{2, 4}		3
Credits		14
Total Credits		123-125

¹ Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and*

General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.

² See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#associatesbachelorsgetext>) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses, rules, and alternative options.

³ Students must select one of the two PHYS course sequences, from the following, in order to meet the 8 credits of the Area III: Laboratory Sciences requirement.

Algebra-Based Sequence

- PHYS 1230G Algebra-Based Physics I/PHYS 1230L Algebra-Based Physics I Lab
- PHYS 1240G Algebra-Based Physics II/PHYS 1240L Algebra-Based Physics II Lab

Calculus-Based Sequence

- PHYS 1310G Calculus -Based Physics I/PHYS 1310L Calculus -Based Physics I Lab
- PHYS 1320G Calculus -Based Physics II/PHYS 1320L Calculus -Based Physics II Lab

⁴ Concentrations are "optional" educational sequences that permit students to focus on particular areas related to their major.

Concentrations "may" often be done without additional credits by judicious use of electives and other optional course requirements.

Engineering Technology - Information - Bachelor of Science in Engineering Technology

Information Engineering Technology (IET) (<https://et.nmsu.edu/information-engineering-technology/>) focusing on the study related to "Information Engineering" – its principles, technologies, networks, and applications. It is a vibrant discipline that has a tremendous impact on the economy as well as society. Information Engineering covers the following areas:

- applied computer programming and coding,
- solutions involving the creation, use, and administration of database technologies,
- information communications & networking environments,
- web and mobile technologies & applications,
- operating systems technologies,
- incident response and digital forensics,
- information security, and
- system integration.

Given the nature of the content in the IET program, students are expected to be familiar and have access to the following:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

Graduates of the program can expect to enter the workforce with titles that include, but are not limited to Systems or Network Administrator,

Project Manager, Database Administrator, Computer Forensics Examiner, Cloud Systems Administrator, and Systems Engineer.

The Information Engineering Technology program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information/>) by the Engineering Technology Accreditation Commission (ETAC) of ABET www.abet.org. (<http://www.abet.org/>)

Engineering Technology - Information (No Concentration)

Students must complete all university degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication (Recommended)	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication	3
<i>Area II: Mathematics</i>		
MATH 1250G	Trigonometry & Pre-Calculus ³	4
<i>Area III: Laboratory Sciences ¹</i>		
Choose two courses with lab from Biology, Chemistry, or Physics ¹		
<i>Area IV: Social/Behavioral Sciences ¹</i>		
<i>Area V: Humanities ¹</i>		
<i>Area VI: Creative and Fine Arts ¹</i>		
<i>General Education Elective</i>		
MATH 1435	Applications of Calculus I	3 - 4
or MATH 1511G	Calculus and Analytic Geometry I	
Viewing A Wider World ¹		6
Departmental/College Requirements		
A ST 311	Statistical Applications	3
BCIS 350	Information Systems Analysis and Design	3
BCIS 475	Database Management Systems	3
C S 172	Computer Science I	4
C S 278	Discrete Mathematics for Computer Science	3 - 4
or MATH 1531	Introduction to Higher Mathematics	
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 160	Windows Fundamentals for IET	3
E T 182	Introduction to Digital Logic	2
E T 255	Linux System Administration	3
E T 280	Web Design and Multimedia	3
E T 339	Introduction to Digital Forensics and Incident Response	3
E T 344	Microprocessor Systems	3
E T 362	Software Technology II	3
E T 377	Computer Networking I	3
E T 410	Senior Seminar	1
E T 435	Senior Project	3

E T 439	Advanced Digital Forensics and Incident Response	3
E T 458	Web Development and Database Applications	3
E T 463	Enterprise Linux Administration	3
E T 464	Windows Enterprise Administration	3
E T 477	Computer Networking II	3
ENGR 140	Introduction to Programming and Embedded Systems	4
I E 451	Engineering Economy	3
ICT 457	Introduction to Information Security Technology	3
or BCIS 480	E-Commerce Security	
MATH 1440	Applications of Calculus II ²	3 - 4
or MATH 1521G	Calculus and Analytic Geometry II	
<i>Technical Electives (choose from the list below) ⁴</i>		9
E T 475	Special Topics in Information Technology	
E T 480	Innovation and Product Development	
E T 483	Mobile App Programming and Development	
E T 485	White Hat System Testing	
ICT 320	Introduction to Internet Protocols	
ICT 450	Ethical Hacking	
Second Language: (not required)		
Electives, to bring the total credits to 120 ³		
Total Credits		121-124

¹ See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#associatesbachelorsgetext>) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

² For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit. **students may need to take any prerequisites needed to enter the class(es) first.*

³ Elective credit may vary based on Math course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Concentrations and Minors are "optional" educational sequences that students may choose to focus on particular areas related to their major. Concentrations and Minors may often be done without additional credits by judicious use of electives and other optional course requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
C S 172	Computer Science I	4
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 160	Windows Fundamentals for IET	3
ENGL 1110G	Composition I (Area I) ¹	4
MATH 1250G	Trigonometry & Pre-Calculus (Area II) ^{1, 3}	4
Credits		16

Spring

Area IV: Social/Behavioral Sciences ¹		3
E T 182	Introduction to Digital Logic	2
ENGL 2210G	Professional & Technical Communication (Area I) ¹	3
ENGR 140	Introduction to Programming and Embedded Systems	4
MATH 1435 or MATH 1511G	Applications of Calculus I ² or Calculus and Analytic Geometry I	3 - 4
Credits		15-16

Second Year

Fall		Credits
Area V: Humanities ¹		3
COMM 1115G	Introduction to Communication (Area I) ¹	3
E T 255	Linux System Administration	3
E T 280	Web Design and Multimedia	3
MATH 1440 or MATH 1521G	Applications of Calculus II ² or Calculus and Analytic Geometry II	3 - 4
Credits		15-16

Spring

Area III: Laboratory Sciences (Biology, Chemistry or Physics) ¹		4
Area VI: Creative and Fine Arts ¹		3
C S 278 or MATH 1531	Discrete Mathematics for Computer Science or Introduction to Higher Mathematics	3 - 4
E T 344	Microprocessor Systems	3
E T 362	Software Technology II	3
Credits		16-17

Third Year

Fall		Credits
Area III: Laboratory Sciences (Biology, Chemistry or Physics) ¹		4
BCIS 350	Information Systems Analysis and Design	3
E T 339	Introduction to Digital Forensics and Incident Response	3
E T 377	Computer Networking I	3
Technical Elective ⁴		3
Credits		16

Spring

BCIS 475	Database Management Systems	3
E T 439	Advanced Digital Forensics and Incident Response	3
E T 477	Computer Networking II	3
Technical Elective ⁴		3
Viewing a Wider World ¹		3
Credits		15

Fourth Year**Fall**

A ST 311	Statistical Applications	3
E T 464	Windows Enterprise Administration	3
I E 451	Engineering Economy	3
Technical Elective ⁴		3
Viewing a Wider World Course ¹		3

Credits **15**

Spring

E T 410	Senior Seminar	1
E T 435	Senior Project	3
E T 458	Web Development and Database Applications	3
E T 463	Enterprise Linux Administration	3
ICT 457 or BCIS 480	Introduction to Information Security Technology or E-Commerce Security	3

Credits **13**

Total Credits **121-124**

¹ See the General Education (p. 220) (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#associatesbachelorsgetext>) section of this catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of this catalog for a full list of courses.

² For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements.

Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.

**Students may need to take any prerequisites needed to enter the class(es) first.*

³ Elective credit may vary based on Math course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Concentrations and Minors are "optional" educational sequences that students may choose to focus on particular areas related to their major. Concentrations and Minors may often be done without additional credits by judicious use of electives and other optional course requirements.

Engineering Technology - Mechanical - Bachelor of Science in Engineering Technology

MET (<https://et.nmsu.edu/academics%20/mechanical-engineering-technology.html>) majors learn theory and applications in the fields of manufacturing, product design and development, power systems, machinery, and fluid technology. Our students take courses in mechanisms and machines, computer aided modeling, heat transfer, and instrumentation, to name a few. They find employment in the design and testing of tools, engines, machines, and other complex mechanical

devices. MET represents one of the broadest engineering technology disciplines. Our MET students also learn by designing and racing mini-baja cars, designing and constructing machines to help our farmers, and even building systems in other countries.

The Mechanical Engineering Technology program is accredited (<https://et.nmsu.edu/accreditation-and-assessment/degree-accreditation-information/>) by the Engineering Technology Accreditation Commission (ETAC) of ABET, www.abet.org (<http://www.abet.org/>)

Engineering Technology - Mechanical (No Concentration)

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i> ¹		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication (Recommended)	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication	3
<i>Area II: Mathematics</i> ¹		
MATH 1435 or MATH 1511G	Applications of Calculus I ² Calculus and Analytic Geometry I	3 - 4
<i>Area III: Laboratory Sciences</i> ¹		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	8
PHYS 1230G & PHYS 1230L or PHYS 1310G & PHYS 1310L	Algebra-Based Physics I and Algebra-Based Physics I Lab Calculus -Based Physics I and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences</i> ¹		
Strongly Recommended:		
ECON 1110G	Survey of Economics	
PHLS 1110G	Personal Health & Wellness	
PSYC 1110G	Introduction to Psychology	
SOCI 1110G	Introduction to Sociology	
<i>Area V: Humanities</i> ¹		
Strongly Recommended:		
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 2110G	Introduction to Ethics	
<i>Area VI: Creative and Fine Arts</i> ¹		
ARTS 1145G	Visual Concepts (Strongly Recommended)	3
<i>General Education Elective</i>		
MATH 1440 or MATH 1521G	Applications of Calculus II Calculus and Analytic Geometry II	3 - 4
Viewing A Wider World ¹		
Strongly Recommended Courses:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
MGMT 310V	Entrepreneurial Mindset	
MGMT 388V	Leadership and Ethics	
MKTG 311V	Consumer Behavior	
Departmental/College Requirements		
A ST 311	Statistical Applications	3
E T 101	Introduction to Engineering Technology and Geomatics	1

E T 182	Introduction to Digital Logic	2
E T 184	Applied AC Circuits	2
E T 210	Intermediate 3-D Modeling (Solid Works)	3
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	4
E T 305	Introduction to Product Design	3
E T 306 & 306 L	Fundamental and Applied Thermodynamics and Thermodynamics Lab	4
E T 308 & 308 L	Fluid Technology and Fluid Technology Lab	4
E T 310 & 310 L	Applied Strength of Materials and Applied Strength of Materials Lab	4
E T 396	Heat Transfer and Applications	3
E T 402	Instrumentation	3
E T 410	Senior Seminar	1
E T 426	Analysis and Design of Machine Elements	3
ENGR 110	Introduction to Engineering Design	3
ENGR 120	DC Circuit Analysis	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
I E 451	Engineering Economy	3
PHYS 1240G & PHYS 1240L or PHYS 1320G & PHYS 1320L	Algebra-Based Physics II and Algebra-Based Physics II Lab Calculus -Based Physics II and Calculus -Based Physics II Lab	4
<i>Technical Electives</i> ⁴		9
E T 317	Advanced Manufacturing and Design	
E T 381	Renewable Energy Technologies	
E T 401	Heating and Air-Conditioning Systems	
E T 480	Innovation and Product Development	
E T 482	Manufacturing Technology	
Electives, to bring the total credits to 122		0
Total Credits		122-124

¹ See the General Education (p. 220) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

² Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

³ Elective credit may vary based on Math course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more

or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Concentrations and Minors are 'optional' educational sequences that students may choose to focus in particular areas related to their major. Concentrations and Minors may often be done without additional credits by judicious use of electives and other optional course requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
E T 101	Introduction to Engineering Technology and Geomatics	1
ENGL 1110G	Composition I (Area I) ¹	4
ENGR 110	Introduction to Engineering Design	3
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
Credits		16

Spring

Area IV: Social/Behavioral Sciences (see recommended list) ¹		3
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
COMM 1115G	Introduction to Communication (Area I)	3
E T 182	Introduction to Digital Logic	2
MATH 1435 or MATH 1511G	Applications of Calculus I ² or Calculus and Analytic Geometry I	3 - 4
Credits		15-16

Second Year

Fall		
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 233	Engineering Mechanics I	3
MATH 1440 or MATH 1521G	Applications of Calculus II ² or Calculus and Analytic Geometry II	3 - 4
PHYS 1230G & PHYS 1230L or PHYS 1310G and PHYS 1310L	Algebra-Based Physics I or Calculus -Based Physics I and Calculus - Based Physics I Lab	4
Credits		14-15

Spring

E T 184	Applied AC Circuits	2
E T 210	Intermediate 3-D Modeling (Solid Works)	3
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	4
ENGR 234	Engineering Mechanics II	3
PHYS 1240G & PHYS 1240L or PHYS 1320G and PHYS 1320L	Algebra-Based Physics II or Calculus -Based Physics II and Calculus - Based Physics II Lab	4
Credits		16

Third Year**Fall**

Area V: Humanities (see recommended list) ¹	3
A ST 311 Statistical Applications	3
E T 306 Fundamental and Applied Thermodynamics and Thermodynamics Lab	4
E T 308 Fluid Technology and Fluid Technology Lab	4
ENGL 2210G Professional & Technical Communication	3
Credits	17

Spring

E T 305 Introduction to Product Design	3
E T 310 Applied Strength of Materials and Applied Strength of Materials Lab	4
E T 396 Heat Transfer and Applications	3
Technical Elective (from pre-approved list) ⁴	3
Viewing a Wider World (See recommended list) ¹	3
Credits	16

Fourth Year**Fall**

Area VI: Creative and Fine Arts (see recommended list) ¹	3
E T 426 Analysis and Design of Machine Elements	3
ENGR 401 Engineering Capstone I	3
Technical Elective (from pre-approved list) ⁴	3
Viewing a Wider World (see recommended list) ¹	3
Credits	15

Spring

E T 402 Instrumentation	3
E T 410 Senior Seminar	1
ENGR 402 Engineering Capstone II	3
I E 451 Engineering Economy	3
Technical Elective (from pre-approved list) ⁴	3
Credits	13
Total Credits	122-124

¹ See the General Education (p. 220) section of this catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of this catalog for a full list of courses.

² Students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I/MATH 1435 Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II/MATH 1440 Applications of Calculus II before enrolling in either option of coursework.

**For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are recommended and will satisfy both the Area II and General Education Elective requirements. Students who take MATH 1435 Applications of Calculus I and MATH 1440 Applications of Calculus II, will need to have an exception made for their degree audit.*

³ Elective credit may vary based on Math course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁴ Concentrations and Minors are 'optional' educational sequences that students may choose to focus in particular areas related to

their major. Concentrations and Minors may often be done without additional credits by judicious use of electives and other optional course requirements.

Geomatics - Bachelor of Science in Geomatics

Geomatics (<https://et.nmsu.edu/academics%20/geomatics-surveying.html>) is a rapidly developing engineering discipline that focuses on acquiring and analyzing precise spatial information. Geomatics engineers use a variety of technologies such as Unmanned Aerial Vehicles, Global Navigation Satellite Systems, High-Definition 3D Laser scanners, High-resolution satellite images, and Geographic Information Systems. They measure terrestrial and three-dimensional positions of points on, above, and below the earth's surface and the distance and angles between them at a high level of precision. Geomatics engineers aid in the design of infrastructure including roads, bridges and legal boundaries for ownership. They provide precise data for natural resource managers, subdivision developers, and coastal monitoring systems.

The program is designed to provide cutting-edge industrial needs as well as to meet the educational requirements for registration as a Professional Land Surveyor in different states.

The mission of the Department of ETSE is to provide men and women with the rigorous, fundamental education needed to enter and succeed in the Geomatics and related professions. To accomplish this mission, the department will introduce students to the theory and application of recognized geomatics principles.

The Geomatics degree is offered online. Students can start as freshmen or transfer. As part of the curriculum requirements, transfer students must complete college-level work that includes General Education Area I, IV, V, and VI (19 credit: see the [General Education \(https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext\)](https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses), Calculus I and II (6-8 credit), Physics I (4 -credit), elective science with lab (4 credit), computer drafting (3 credit), statistics (A ST 311 or equivalent: 3 credit), computer programming (3 credit), plane surveying (3 credit), introduction to GIS (3-4 credit), surveying/civil drafting (3 credit), and approved electives to bring total transfer credits to 59.

Requirements (120 Credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed in order to take the necessary English and Mathematics coursework.

Students must also take the Fundamentals of Surveying examination prior to graduation.

Prefix	Title	Credits
General Education		
Area I: Communications ¹		10
	English Composition - Level 1	
	English Composition - Level 2	
	Oral Communication	

Area II: Mathematics ¹		
MATH 1511G	Calculus and Analytic Geometry I ²	3-4
or MATH 1435	Applications of Calculus I	
Area III: Laboratory Sciences ¹		
PHYS 1230G	Algebra-Based Physics I	
& PHYS 1230L	and Algebra-Based Physics I Lab	
or PHYS 1310G	Calculus -Based Physics I	
& PHYS 1310L	and Calculus -Based Physics I Lab	
One additional Area III: Laboratory Sciences for 4 credits ¹		
Area IV: Social and Behavioral Sciences ¹		3
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		
MATH 1521G	Calculus and Analytic Geometry II ²	3-4
or MATH 1440	Applications of Calculus II	
Viewing A Wider World ¹		6
Departmental/College Requirements		
The Geomatics degree is offered online. Students can start as freshmen or transfer. ^{4,5}		
A ST 311	Statistical Applications	3
BLAW 2110	Business Law I	3
or BLAW 316	Legal Environment of Business	
or BLAW 325	Real Estate Principles and Law I	
C S 151	C++ Programming	3
or C S 152	Java Programming	
or C S 153	Python Programming I	
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil Drafting Fundamentals	3
E T 355	Site/Land Development and Layout	3
GEOG 381	Cartography and Geographic Information Systems	4
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
I E 451	Engineering Economy	3
MATH 2415	Introduction to Linear Algebra ³	3
or MATH 2530G	Calculus III	
or MATH 377	Introduction to Numerical Methods	
or MATH 391	Vector Analysis	
or MATH 392	Introduction to Ordinary Differential Equations	
Program-Specific Requirements		
SUR 222	Introduction to Geomatics	3
SUR 285	Precise Digital Mapping	3
SUR 292	Legal Principles and Boundary Law I	3
SUR 312	Public Land Survey System Boundaries	3
SUR 328	Construction Surveying & Automation Technologies	3
SUR 351	Spatial Data Adjustment I	3
SUR 361	Geodesy/Geodetic Control Surveying	3
SUR 401	Ethics and Professionalism in Surveying and Mapping	3
SUR 450	Senior Project	3
SUR 451	Spatial Data Adjustment II	3
SUR 452	Spatial Data Integration and Analysis	3
SUR 461	GNSS Positioning	3
SUR 464	Legal Principles and Boundary Law II	3
SUR 485	Emerging Techniques in Geospatial Technologies	3
Second Language: (not required)		

Electives, to bring the total credits to 120 ⁵	7-5
Total Credits	120

¹ See the General Education (p. 220) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of this catalog for a full list of courses.

² For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I (or equivalent) and MATH 1521G Calculus and Analytic Geometry II (or equivalent) are recommended and will satisfy both the Area II and General Education Elective requirements.

Students who take MATH 1435 Applications of Calculus I (or equivalent) and MATH 1440 Applications of Calculus II (or equivalent), will need to have an exception made for their degree audit.

**for either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.*

³ Or any MATH 400 or above

⁴ Transfer students must complete college-level work that includes General Education Area I, IV, V, and VI (19 credit: see the [General Education \(https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext\)](https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses), Calculus I and II (6-8 credit), Physics I (4 - credit), elective science with lab (4 credit), computer drafting (3 credit), statistics (A ST 311 or equivalent: 3 credit), computer programming (3 credit), plane surveying (3 credit), introduction to GIS (3-4 credit), surveying/civil drafting (3 credit), and approved electives to bring total transfer credits to 59.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case by case basis and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

The contents and order of this roadmap may vary depending on the students' transfer credits, some courses may need to be completed in addition to the ones listed below. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
Transfer 29 Credits ^{1,4,5}		29
Credits		29
Second Year		
Transfer 30 Credits ^{1,4,5}		30
Credits		30
Third Year		
Fall		
BLAW 2110	Business Law I	3
or BLAW 316	or Legal Environment of Business	
or BLAW 325	or Real Estate Principles and Law I	
MATH 2415	Introduction to Linear Algebra ³	3
or MATH 2530G	or Calculus III	
or MATH 377	or Introduction to Numerical Methods	
or MATH 391	or Vector Analysis	
or MATH 392	or Introduction to Ordinary Differential Equations	

SUR 292	Legal Principles and Boundary Law I	3
SUR 361	Geodesy/Geodetic Control Surveying	3
Viewing a Wider World ¹		3
Credits		15
Spring		
E T 355	Site/Land Development and Layout	3
SUR 285	Precise Digital Mapping	3
SUR 312	Public Land Survey System Boundaries	3
SUR 328	Construction Surveying & Automation Technologies	3
SUR 351	Spatial Data Adjustment I	3
Credits		15
Fourth Year		
Fall		
GEOG 481	Fundamentals of Geographic Information Science (GIS)	4
SUR 451	Spatial Data Adjustment II	3
SUR 464	Legal Principles and Boundary Law II	3
SUR 485	Emerging Techniques in Geospatial Technologies	3
Credits		13
Spring		
I E 451	Engineering Economy	3
SUR 450	Senior Project	3
SUR 461	GNSS Positioning	3
Viewing a Wider World ¹		3
Credits		12
Summer		
SUR 401	Ethics and Professionalism in Surveying and Mapping	3
SUR 452	Spatial Data Integration and Analysis	3
Credits		6
Total Credits		120

¹ See the General Education (p. 224) section of this catalog for a full list of courses. See the Viewing a Wider World (p. 224) section of this catalog for a full list of courses.

² For students wishing to pursue a technical master's degree, MATH 1511G Calculus and Analytic Geometry I (or equivalent) and MATH 1521G Calculus and Analytic Geometry II (or equivalent) are recommended and will satisfy both the Area II and General Education Elective requirements.

Students who take MATH 1435 Applications of Calculus I (or equivalent) and MATH 1440 Applications of Calculus II (or equivalent), will need to have an exception made for their degree audit.

**for either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.*

³ Or any MATH 400 and above.

⁴ Transfer students must complete college-level work that includes General Education Area I, IV, V, and VI (19 credit: see the [General Education \(https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext\)](https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of this catalog for a full list of courses), Calculus I and II (6-8 credit), Physics I (4 - credit), elective science with lab (4 credit), computer drafting (3 credit), statistics (A ST 311 or equivalent: 3 credit), computer programming (3 credit), plane surveying (3 credit), introduction to GIS (3-4 credit), surveying/civil drafting (3 credit), and approved electives to bring total transfer credits to 59.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case by case basis and students should discuss elective requirements with their academic advisor.

Information and Communication Technology - Bachelor of Information and Communication Technology

The Bachelor of Information and Communication Technology (ICT) (<https://et.nmsu.edu/academics%20/information-communication-technology.html>) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- No Concentration (p. 1039) (**this option**) - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- Cyber Defense Concentration (p. 1043) - focused on cyber security and defense, including ethical hacking and digital forensics;
- Network Technologies Concentration (p. 1046) - focused on computer network design, configuration, and security;
- Software Development Concentration (p. 1049) - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (<https://accreditation.nmsu.edu/>) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications ¹</i>		10
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra (Equivalent or Higher) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ¹</i>		10-11
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective ¹</i>		3-4
Viewing A Wider World ²		6
Departmental/College Requirements		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Technical Elective (Choose 4 courses from the following) ³</i>		12
E T 483	Mobile App Programming and Development	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 372	Software Engineering and Design	
ICT 439	Advanced Digital Forensics and Incident Response	
ICT 458	Web Development and Database Applications	
ICT 460	Advanced Software Development Concepts	
ICT 463	Enterprise Network Administration	
ICT 467	Communication Network Security	
ICT 477	Computer Networking II	
ICT 487	Data Security	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		19-16
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Completion Degree

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications ¹</i>		10
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra (Equivalent or Higher) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ¹</i>		10-11
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective ¹</i>		3-4
Viewing A Wider World ²		6
Departmental/College Requirements		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3

ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Technical Elective (Choose 4 courses from the following)</i> ³		12
E T 483	Mobile App Programming and Development	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 372	Software Engineering and Design	
ICT 439	Advanced Digital Forensics and Incident Response	
ICT 458	Web Development and Database Applications	
ICT 460	Advanced Software Development Concepts	
ICT 463	Enterprise Network Administration	
ICT 467	Communication Network Security	
ICT 477	Computer Networking II	
ICT 487	Data Security	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		31-28
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 4-Year Bachelor's Degree

A Suggested Plan of Study for Students

These roadmaps assume student placement in MATH 1220G College Algebra or higher. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous coursework. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring and summer semester and may be subject to modification or change.

All Information and Communication Technology requirements must be completed with a C- or higher grade.

First Year		
Fall		Credits
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course ⁴		3
General Education Area I ¹		4
General Education Area II (MATH 1220G or Higher) ¹		3-4
General Education IV ¹		3
Credits		16-17
Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I ¹		3
General Education Area III ¹		4
General Education Area V ¹		3
Credits		16
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I ¹		3
General Education Area VI ¹		3
Elective Course ⁴		3
Credits		15
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV ¹		3-4
General Education Elective ¹		3
Elective Course ⁴		3
Credits		15-16
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course ⁴		3
Elective Course ⁴		3
Elective Course ⁴		3
Credits		15
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Technical Elective (from pre-approved list) ³		3
Credits		15
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
Technical Elective (from pre-approved list) ³		3
Technical Elective (from pre-approved list) ³		3
Credits		15

Spring		
ICT 457	Introduction to Information Security Technology	3
Electives to bring total to 120 credits (if necessary) ⁴		1-0
Technical Elective (from pre-approved list) ³		3
Viewing a Wider World ²		6
Credits		13-12
Total Credits		120-121

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

A Suggested Plan of Study for Students

These roadmaps assume student placement in MATH 1220G College Algebra or higher. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous coursework. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring and summer semester and may be subject to modification or change.

All Information and Communication Technology requirements must be completed with a C- or higher grade.

First Year		Credits
Elective Credits (include General Education credits) ^{1, 4}		30
Credits		30
Second Year		
Elective Credits (include General Education credits) ^{1, 4}		33
Credits		33
Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3

ICT 377	Computer Networking I	3
Credits		15
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Technical Elective (from pre-approved list) ³		3
Credits		15
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
Technical Elective (from pre-approved list) ³		6
Credits		15
Spring		
ICT 457	Introduction to Information Security Technology	3
Technical Elective (from pre-approved list) ³		3
Viewing a Wider World ²		6
Credits		12
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (120 credits)

The Bachelor of Information and Communication Technology (ICT) (<https://et.nmsu.edu/academics%20/information-communication-technology.html>) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- No Concentration (p. 1039) - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- Cyber Defense Concentration (p. 1043) (**this option**) - focused on cyber security and defense, including ethical hacking and digital forensics;
- Network Technologies Concentration (p. 1046) - focused on computer network design, configuration, and security;
- Software Development Concentration (p. 1049) - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office @.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (<https://accreditation.nmsu.edu/>) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications</i> ¹		10
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		

<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra (Equivalent or Higher) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i> ¹		10-11
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences or Area IV: Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ²		6
Departmental/College Requirements		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Concentration/Technical Electives (Take all four courses)</i>		12
ICT 339	Introduction to Digital Forensics and Incident Response ³	
ICT 439	Advanced Digital Forensics and Incident Response ³	
ICT 467	Communication Network Security ³	
ICT 487	Data Security ³	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		19-16
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration

options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

- ⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications</i> ¹		10
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra (Equivalent or Higher) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i> ¹		10-11
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences or Area IV: Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i> ¹		3-4
Viewing A Wider World ²		6
Departmental/College Requirements		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Concentration/Technical Elective (take all four courses)</i> ³		12
ICT 339	Introduction to Digital Forensics and Incident Response ³	
ICT 439	Advanced Digital Forensics and Incident Response ³	
ICT 467	Communication Network Security ³	
ICT 487	Data Security ³	
Second Language: (not required)		

Electives, to bring the total credits to 120 ⁴	31-28
Total Credits	120

- ¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
- ² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
- ³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
- ⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

These roadmaps assume student placement in MATH 1220G College Algebra or higher. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous coursework. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring and summer semester and may be subject to modification or change.

All Information and Communication Technology requirements must be completed with a C- or higher grade.

Pathway: 4-year Bachelor's Degree

First Year		
Fall		Credits
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course ⁴		3
General Education Area I ¹		4
General Education Area II (MATH 1220G or Higher) ¹		3-4
General Education IV ¹		3
Credits		16-17
Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I ¹		3
General Education Area III ¹		4
General Education Area V ¹		3
Credits		16

Second Year**Fall**

ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I ¹		3
General Education Area VI ¹		3
Elective Course ⁴		3
Credits		15

Spring

ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV ¹		3-4
General Education Elective ¹		3
Elective Course ⁴		3
Credits		15-16

Third Year**Fall**

ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course ⁴		3
Elective Course ⁴		3
Elective Course ⁴		3
Credits		15

Spring

ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response ³	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Credits		15

Fourth Year**Fall**

ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 439	Advanced Digital Forensics and Incident Response ³	3
ICT 450	Ethical Hacking	3
ICT 487	Data Security ³	3
Credits		15

Spring

ICT 457	Introduction to Information Security Technology	3
ICT 467	Communication Network Security ³	3
Electives to bring total to 120 credits (if necessary) ⁴		1-0
Viewing a Wider World ²		6
Credits		13-12
Total Credits		120-121

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing

a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

First Year	Credits
Elective Credits (include General Education credits) ^{1, 4}	30
Credits	30

Second Year	Credits
Elective Credits (include General Education credits) ^{1, 4}	33
Credits	33

Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Credits		15

Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response ³	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Credits		15

Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 439	Advanced Digital Forensics and Incident Response ³	3
ICT 450	Ethical Hacking	3
ICT 487	Data Security ³	3
Credits		15

Spring		
ICT 457	Introduction to Information Security Technology	3
ICT 467	Communication Network Security ³	3

Viewing a Wider World ²	6
Credits	12
Total Credits	120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Information and Communication Technology (Network Technologies) - Bachelor of Information Communication Technology (120 credits)

The Bachelor of Information and Communication Technology (ICT) (<https://et.nmsu.edu/academics%20/information-communication-technology.html>) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- No Concentration (p. 1039) - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- Cyber Defense Concentration (p. 1043) - focused on cyber security and defense, including ethical hacking and digital forensics;
- Network Technologies Concentration (p. 1046) (**this option**) - focused on computer network design, configuration, and security;
- Software Development Concentration (p. 1049) - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on

face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (<https://accreditation.nmsu.edu/>) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications ¹</i>		<i>10</i>
<i>English Composition - Level 1</i>		
<i>English Composition - Level 2</i>		
<i>Oral Communications</i>		
<i>Area II: Mathematics</i>		<i>3 - 4</i>
MATH 1220G	College Algebra (Equivalent or Higher) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ¹</i>		<i>10-11</i>
<i>Area III: Laboratory Science Course (4 credits)</i>		
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i>		
<i>Either an Area III: Laboratory Sciences or Area IV: Social/Behavioral Sciences Course (3-4 credits)</i>		
<i>Area V: Humanities ¹</i>		<i>3</i>
<i>Area VI: Creative and Fine Arts ¹</i>		<i>3</i>
<i>General Education Elective ¹</i>		<i>3-4</i>
Viewing A Wider World ²		6
Departmental/College Requirements		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3

ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Concentration/Technical Electives (Take all 4 courses)</i>		12
ICT 339	Introduction to Digital Forensics and Incident Response ³	
ICT 463	Enterprise Network Administration ³	
ICT 467	Communication Network Security ³	
ICT 477	Computer Networking II ³	
Second Language: (not required)		
Electives, to bring the total credits to 120⁴		16-19
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
General Education¹		
<i>Area I: Communications¹</i>		10
	English Composition - Level 1	
	English Composition - Level 2	
	Oral Communications	
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra ((equivalent or higher)) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences¹</i>		10-11
<i>Area V: Humanities¹</i>		3
<i>Area VI: Creative and Fine Arts¹</i>		3
<i>General Education Elective¹</i>		3-4
Viewing A Wider World²		6
Departmental/College Requirements		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3

ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Concentration/Technical Electives (take all four courses)³</i>		12
ICT 339	Introduction to Digital Forensics and Incident Response ³	
ICT 463	Enterprise Network Administration ³	
ICT 467	Communication Network Security ³	
ICT 477	Computer Networking II ³	
Second Language: (not required)		
Electives, to bring the total credits to 120⁴		31-28
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous English coursework that was transferred in. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Pathway: 4-year Bachelor's Degree

First Year

Fall		Credits
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course ⁴		3
General Education Area I ¹		4
General Education Area II (MATH 1220G or Higher) ¹		3-4
General Education Area IV ¹		3
Credits		16-17

Spring

ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I ¹		3
General Education Area III ¹		4
General Education Area V ¹		3
Credits		16

Second Year

Fall		Credits
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I ¹		3
General Education Area VI ¹		3
Elective Course ⁴		3
Credits		15

Spring

ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV ¹		3-4
General Education Elective ¹		3
Elective Course ⁴		3
Credits		15-16

Third Year

Fall		Credits
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course ⁴		3
Elective Course ⁴		3
Elective Course ⁴		3
Credits		15

Spring

ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response ³	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Credits		15

Fourth Year

Fall		Credits
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3

ICT 463	Enterprise Network Administration ³	3
ICT 477	Computer Networking II ³	3
Credits		15
Spring		Credits
ICT 457	Introduction to Information Security Technology	3
ICT 467	Communication Network Security ³	3
Electives to bring total to 120 credits (if necessary) ⁴		1-0
Viewing a Wider World ²		6
Credits		13-12
Total Credits		120-121

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Completion Degree

First Year		Credits
Elective Credits (include General Education credits) ^{1, 4}		30
Credits		30
Second Year		Credits
Elective Credits (include General Education credits) ^{1, 4}		33
Credits		33
Third Year		Credits
Fall		Credits
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Credits		15
Spring		Credits
ICT 320	Introduction to Internet Protocols	3

ICT 339	Introduction to Digital Forensics and Incident Response ³	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Credits		15
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 463	Enterprise Network Administration ³	3
ICT 477	Computer Networking II ³	3
Credits		15
Spring		
ICT 457	Introduction to Information Security Technology	3
ICT 467	Communication Network Security ³	3
Viewing a Wider World ²		6
Credits		12
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (120 credits)

The Bachelor of Information and Communication Technology (ICT) (<https://et.nmsu.edu/academics%20/information-communication-technology.html>) degree focuses on designing, implementing, and

managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- No Concentration (p. 1039) - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- Cyber Defense Concentration (p. 1043) - focused on cyber security and defense, including ethical hacking and digital forensics;
- Network Technologies Concentration (p. 1046) - focused on computer network design, configuration, and security;
- Software Development Concentration (p. 1049) (**this option**) - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (<https://accreditation.nmsu.edu/>) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications ¹</i>		10
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra (Equivalent or Higher) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ¹</i>		10-11
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective ¹</i>		3-4
Viewing A Wider World ²		6

Departmental/College Requirements*Program-Specific Requirements*

ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Concentration/Technical Electives (take all four courses)</i>		12
E T 483	Mobile App Programming and Development ³	
ICT 372	Software Engineering and Design ³	
ICT 458	Web Development and Database Applications ³	
ICT 460	Advanced Software Development Concepts ³	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		19-16
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

³ The **provided selection of Technical Electives** will lead to an ICT concentration on **Software Development**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
General Education ¹		
<i>Area I: Communications ¹</i>		10
<i>English Composition - Level 1</i>		
<i>English Composition - Level 2</i>		
<i>Oral Communications</i>		
<i>Area II: Mathematics</i>		3 - 4
MATH 1220G	College Algebra ((equivalent or higher)) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences ¹</i>		10-11
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective ¹</i>		3-4
Viewing A Wider World ²		6
Departmental/College Requirements		
<i>Program-Specific Requirements</i>		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Introduction to Information Security Technology	3
<i>Concentration/Technical Electives (take all four courses)</i>		12
E T 483	Mobile App Programming and Development ³	
ICT 372	Software Engineering and Design ³	
ICT 458	Web Development and Database Applications ³	
ICT 460	Advanced Software Development Concepts ³	
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁴		31-28
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

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Technical Electives pre-approved list for each concentration is provided in this catalog.

- ⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 4-yr Bachelor's Degree

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous English coursework that was transferred in. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course ⁴		3
General Education Area I ¹		4
General Education Area II (MATH 1220G or Higher) ¹		3-4
General Education IV ¹		3
Credits		16-17
Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I ¹		3
General Education Area III ¹		4
General Education Area V ¹		3
Credits		16
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I ¹		3
General Education Area VI ¹		3
Elective Course ⁴		3
Credits		15
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV ¹		3-4
General Education Elective ¹		3
Elective Course ⁴		3
Credits		15-16
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course ⁴		3

Elective Course ⁴		3
Elective Course ⁴		3
Credits		15
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy ²	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Viewing a Wider World Elective ²		3
Credits		15
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
E T 483	Mobile App Programming and Development	3
ICT 458	Web Development and Database Applications	3
Credits		15
Spring		
ICT 372	Software Engineering and Design	3
ICT 457	Introduction to Information Security Technology	3
ICT 460	Advanced Software Development Concepts	3
Viewing a Wider World Elective ²		3
Electives to bring total to 120 credits (if necessary) ⁴		1-0
Credits		13-12
Total Credits		120-121

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

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Pathway: 2+2 Bachelor's Degree

First Year		Credits
Elective Credits (include General Education credits) ⁴		30
Credits		30

Second Year

Elective Credits (include General Education credits) ⁴	33
Credits	33

Third Year

Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Credits		15

Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Viewing a Wider World Elective ²		3
Credits		15

Fourth Year

Fall		
E T 483	Mobile App Programming and Development ³	3
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 458	Web Development and Database Applications ³	3
Credits		15

Spring		
ICT 372	Software Engineering and Design ³	3
ICT 457	Introduction to Information Security Technology	3
ICT 460	Advanced Software Development Concepts	3
Viewing a Wider World ²		3
Credits		12
Total Credits		120

¹ See the General Education (p. 224) section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

² The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 224) Requirements (6 credits). Visit the c (p. 224)atalog's Viewing a Wider World (p. 224) section for a complete list of Viewing a Wider World (p. 224) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

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⁴ **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may

appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Digital Electronic Applications - Undergraduate Minor

A grade of C- (or better) is required in each course (may not be taken S/ U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their technical electives.

For non-ECET majors

Prefix	Title	Credits
Required Courses		
E T 182	Introduction to Digital Logic	2
E T 282	Digital Electronics	4
E T 362	Software Technology II	3
E T 344	Microprocessor Systems	3
E T 398	Digital Systems	4
E T 444	Computer Hardware Senior Design	3
Total Credits		19

Digital Forensics - Undergraduate Minor

A grade of C- (or better) is required in each class. No courses may be taken S/U. All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives.

For non-IET and non-ICT majors

Prefix	Title	Credits
Required Courses		12
E T 255	Linux System Administration	
E T 339	Introduction to Digital Forensics and Incident Response	
E T 439	Advanced Digital Forensics and Incident Response	
ICT 450	Ethical Hacking	
Select two from the following list:		
E T 435	Senior Project (topic must be preapproved and related to security) ¹	6-7
E T 463	Enterprise Linux Administration	
ICT 320	Introduction to Internet Protocols	
ICT 457	Introduction to Information Security Technology	
or BCIS 482	Management of Information Security	
PHYS 304	Forensic Physics	
Total Credits		
		18-19

Geomatics - Undergraduate Minor

Geomatics involves the application of knowledge to the analysis, design and execution of mapping, geomatics, geospatial information systems, and surveying. When performing this work, professionals must have an understanding of: the science of geomatic measurement and analysis; the legal principles of boundary location; the laws related to boundaries

and land use; and applicable mathematical and computational theories and principles. Geomatics is made up of positional accuracy, land planning and development concepts pertinent to subdivision science. Geomatics professionals work for private surveying or engineering firms, for City, County, State or Federal Highway Departments, for State Lands Commissions, for the US Forest Service and for the US Bureau of Land Management, among others.

The mission of the Department of ETSE is to provide students with the rigorous, fundamental education needed to enter and succeed in the Geomatics and related professions. To accomplish this mission, the department will introduce students to the theory and application of recognized geomatics principles.

Prefix	Title	Credits
SUR 222	Introduction to Geomatics	3
or DRFT 222	Introduction to Geomatics	
SUR 292	Legal Principles and Boundary Law I	3
SUR 361	Geodesy/Geodetic Control Surveying	3
Select 3 courses from the following:		9-11
E T 355	Site/Land Development and Layout	
GEOG 373	Introduction to Remote Sensing	
or GEOG 381	Cartography and Geographic Information Systems	
GEOG 481	Fundamentals of Geographic Information Science (GIS)	
SUR 285	Precise Digital Mapping	
SUR 312	Public Land Survey System Boundaries	
SUR 328	Construction Surveying & Automation Technologies	
SUR 351	Spatial Data Adjustment I	
SUR 452	Spatial Data Integration and Analysis	
SUR 461	GNSS Positioning	
SUR 485	Emerging Techniques in Geospatial Technologies	
Total Credits		18-20

Information Security Technology - Undergraduate Minor

A grade of C- or better is required in each course (no courses may be taken S/U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. This minor is not meant to be a fully online minor.

Prefix	Title	Credits
Required Courses		
ICT 450	Ethical Hacking	3
BCIS 482	Management of Information Security	3
C S 272	Introduction to Data Structures	4
C S 478	Computer Security	3
Elective - Select two from the following:		6-7
ICT 320	Introduction to Internet Protocols	
CJUS 434	Probation, Parole, and Community Corrections	
PHYS 304	Forensic Physics	
PHIL 323V	Engineering Ethics	
or CJUS 425	Issues in Ethics, Law, and Criminal Justice	
E T 435	Senior Project (must be preapproved and information security topic)	

or ICT 435 Senior Project

Total Credits **19-20**

Manufacturing - Undergraduate Minor

The *Manufacturing Minor* provides students with an augmenting skillset to better facilitate entry-level employment in manufacturing related industries. Students completing the *Minor* also acquire specialized knowledge needed for successful pursuit of a career in the manufacturing sector.

Typical skills gained from *Manufacturing Minor* coursework include: management and coordination of manufacturing processes, design for manufacturing, fabrication and assembly, product design and development, product specification, operations planning, scheduling, material handling, quality control, testing, evaluation and product validation.

A grade of C- or better is required in each course (may not be taken S/U). All prerequisites must be met before enrolling in a course. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives.

Prefix	Title	Credits
Required Courses: Select one manufacturing course with any accompanying/embedded lab from the following:		3-4
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	
I E 217	Manufacturing Processes	
M E 222	Introduction to Product Development	
Select one from the following:		3
MGMT 335V	Business and Government	
MGMT 344	Production and Operations Management	
E T 305	Introduction to Product Design	3
E T 317	Advanced Manufacturing and Design	3
E T 480	Innovation and Product Development	3
E T 482	Manufacturing Technology	3
Total Credits		18-19

Renewable Energy Technologies - Undergraduate Minor

A grade of C- or better is required in each course (no courses may be taken S/U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. Students may receive credit for only one special topic course (must be renewable content) or internship.

Prefix	Title	Credits
Required Courses		
Select any three from the required list		9
E T 381	Renewable Energy Technologies ¹	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	

Select 6 credits from the following list:

6

Any extra course from the required list	
C E 256/ENVS 2111	Environmental Engineering and Science
C E 356	Fundamentals of Environmental Engineering
CHME 486	Biofuels
E T 396	Heat Transfer and Applications
or M E 341	Heat Transfer
E T 456	Applied Power Technologies ¹
E T/M E 401	Heating and Air-Conditioning Systems
I E 490	Selected Topics ²
C E 498	Special Topics ²
E T 420	Senior Internship ²
E T 435	Senior Project ²
Select 3 credits from the following: ³	
AEEC 590	Special Topics ²
AEEC 337V	Natural Resource Economics
AEEC 420	Special Problems ²
ECON 337V	Natural Resource Economics
E T 360V	Technology in Business and Society
ECON 384V	Water Resource Economics
EPWS 380V	Science & Society
HIST 302V	Science in Modern Society
PHYS 303V	Energy and Society in the New Millennium
Total Credits	18

¹ Not available for ECET majors as a required course. Select from other choices

² Must be related to a renewable energy field and preapproved by faculty advisor.

³ If the selected class is outside the student's college it may also satisfy a Viewing a Wider World requirement.

Industrial Engineering

Undergraduate Program Information

Industrial engineers design, develop, install, and improve integrated systems. Integrated systems can involve people, equipment, information, financial resources, software, materials, or energy. Industrial engineers work in a variety of manufacturing, health care, utility, retail, government, and research settings, therefore the tools and methods of the industrial engineer are both varied and broad. Industrial Engineers use knowledge and skills in engineering, mathematics, and physical and social sciences. They also use principles and methods of engineering analysis and design to monitor and improve systems. New Mexico State University's undergraduate degree program in Industrial Engineering prepares students to join the workforce or pursue graduate education while setting the foundation for lifelong learning.

Specifically, within 2-3 years of graduation, graduates of the program will have:

- successfully applied various industrial Engineering techniques in an integrated fashion to solve real-world problems in process design and/or improvement;
- been engaged in a successful career sustained by life-long learning experiences

In addition, the Engineering Accreditation Commission of ABET, Inc. criteria in conjunction with the Institute of Industrial Engineers, requires that:

- baccalaureate degree graduates will be able to demonstrate the ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment, and energy;
- industrial engineering curricula include in-depth instruction allowing students to accomplish the integration of systems using appropriate analytical, computational, and experimental practices; and
- that faculty teaching in industrial engineering departments shows evidence of understanding professional practice and staying current in their respective professional areas. Program faculty must have a responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

Master's Accelerated Program: The Master's Accelerated Program (MAP) option provides excellent opportunities for academically qualified undergraduate students to begin working on a master's degree during their junior year and senior year. The student must obtain prior approval from the department head before starting the MAP. Note that the MAP is only applicable if the student has not yet completed a bachelor's degree.

Graduate Program Information

The Department of Industrial Engineering offers graduate work leading to the degrees of Master of Engineering in Industrial Engineering (MEIE), Master of Science in Industrial Engineering (MSIE), and Doctor of Philosophy (Ph.D.) with a specialization in industrial engineering. Areas of emphasis include

- operations research and simulation analytics,
- manufacturing systems,
- quality and reliability engineering,
- engineering management and systems engineering.

Departmental admission requirements in addition to those of the Graduate School must be considered on an individual basis because of the diversity of backgrounds of applicants in the program. An applicant should meet or correspond directly with the department as a first step in determining his or her specific admission status. Applicants should present mathematics preparation equivalent to 9 credits of calculus for engineers, 3 credits of differential equations, and 3 credits of calculus-based probability and statistics.

The MEIE is a Professional Master's degree targeting a working professional who wants to pursue a Master's degree in Industrial Engineering. The minimum credit-hour requirements for the MEIE degree may be met in the following way:

- 30-semester credits of approved coursework.

The MSIE is a research-oriented degree. The minimum credit-hour requirements for the MSIE degree may be met in any of the following ways:

- 24-semester credits approved course work and 6-semester credits of thesis (I E 599 Master's Thesis) for a total of 30-semester credits or
- 27-semester credits approved course work and 3-semester credits of project (I E 598 Special Research Programs) for a total of 30-semester credits.

Approved coursework must meet all requirements of the Graduate School, represent a consistent master's program in relation to a student's

graduate study goals as determined through consultation with the graduate program adviser, and be approved by a program committee of the graduate faculty of the department. Programs in the focus areas of operations research and simulation analytics, manufacturing systems, quality and reliability engineering, or engineering management and systems engineering can be developed with the aid of a faculty advisor.

Departmental facilities and equipment are available to support the research efforts of graduate students, including computer terminals and laboratories. In addition to departmental facilities, supporting facilities such as the Aggie Innovation Space (AIS) and interdisciplinary research clusters are available for research work.

The Ph.D. program is research-oriented with the final product being the dissertation. The general information (p. 31) chapter in this catalog describes the Ph.D. degree program. The Ph.D. in Industrial Engineering also includes the following requirements:

- the coursework must include at least 12 credits at the 500 level in a related field,
- 6 credits of 600-level research courses covering two areas, and
- 18 credits of 700-level courses following successful completion of the comprehensive examination.

The department does not have any foreign language or research tool requirements. Interested individuals should correspond directly with the department to determine eligibility for admission.

Degrees for the Department

Bachelor Degree(s)

- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 1059)

Master Degree(s)

The Master of Science in Industrial Engineering degree is a research-oriented degree. If you are interested in pursuing an advanced degree for a career in the engineering sciences or in preparation for a Ph.D., our MS degree is for you. The Master of Engineering in Industrial Engineering is the coursework-only degree. It is a **Professional Master's degree** targeting a working professional who wants to pursue a Master's degree in Industrial Engineering at New Mexico State University.

- Industrial Engineering - Master of Engineering in Industrial Engineering (p. 151)
- Industrial Engineering - Master of Engineering in Industrial Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/industrial-engineering-meie-online/>)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 152)
- Industrial Engineering - Master of Science in Industrial Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/industrial-engineering-msie-online/>)

Doctoral Degree(s)

- Engineering (Industrial Engineering) - Doctor of Philosophy (p. 190)

Minors for the Department

- Advanced Manufacturing - Graduate Minor (p. 212)
- Entrepreneurship - Undergraduate Minor (p. 1060)
- Lean Manufacturing and Analytics - Undergraduate Minor (p. 1061)

- Supply Chain and Operations Research Analytics - Undergraduate Minor (p. 1061)
- Systems Engineering - Undergraduate Minor (p. 1062)

Graduate Certificates

- Systems Engineering - Graduate Certificate (p. 211)

Hansuk, Sohn, Department Head

Professor Edward Pines;

Associate Professors Hansuk Sohn (Department Head), John Mullen, Raja Jayaraman;

Assistant Professors Chaitanya Mahajan

Professor of Practices Manuel Ivan Rodriguez Borbon

H. Sohn, Department Head, Ph.D. (University of Iowa)– Combinatorial optimization, Operations Research applications in logistics, transportation, and health systems; E. Pines, Ph.D. (Penn State)– Quality and continuous improvement, technology policy; J. Mullen, Ph.D. (Iowa State)– Stochastic processes, quality, improvement, production system design; R. Jayaraman, Ph.D. (Texas Tech)– Digital supply chain, applied Operations Research, healthcare systems engineering; C. Mahajan, Ph.D. (Rochester Institute of Technology)– Additive manufacturing, computer integrated manufacturing, manufacturing systems; M. I. Rodriguez Borbon, Ph.D. (NMSU)– Experimental statistics, reliability, degradation analysis, survival analysis, lifecycle analysis.

Industrial Engineering Courses

I E 151. Computational Methods in Industrial Engineering

3 Credits (3)

History, social implications, and application of computers and an introduction to computer programming, word processing, and database management systems. Satisfies General Education computer science requirement.

Prerequisite: MATH 1220G.

I E 200. Special Problems-Sophomore

1-3 Credits

Directed individual projects. May be repeated for a total of 3 credits.

Prerequisite: consent of faculty member.

I E 217. Manufacturing Processes

3 Credits (3)

Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: E T 217.

Prerequisite: E T 110 and MATH 1220G.

Learning Outcomes

1. Various

I E 300. Special Problems-Junior

1-3 Credits

Directed individual projects. May be repeated for a total of 3 credits.

Prerequisite: consent of faculty member.

I E 311. Engineering Data Analysis**3 Credits (3)**

Methodology and techniques associated with identifying and analyzing industrial data.

Prerequisite: C- or better in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to correctly interpret statistical reports
2. Ability to correctly identify and solve problems involving continuous and discrete probability and random variables.
3. Ability to correctly analyze random samples using methods that include: point estimates, confidence intervals, tests of hypothesis, analysis of variance (ANOVA), and linear regression.

I E 316. Methods Engineering**3 Credits (2+3P)**

Methods analysis and design. Work measurement techniques. Job evaluation and wage incentive methods. May be repeated up to 3 credits.

Prerequisite(s): I E 217, I E 311, E T 110.

I E 351. Applied Problem Solving in Industrial Engineering**3 Credits (3)**

Application of computational techniques to engineering problems including the use of commercial programs in statistics and applied mathematics. Restricted to majors.

Corequisite(s): I E 311.

I E 365. Quality Control**3 Credits (3)**

Statistical analysis of quality in manufacturing. Acceptance sampling and control charts.

Prerequisite: I E 311 or equivalent.

I E 375. Manufacturing Processes II**3 Credits (3)**

Review of basic manufacturing processes. Advanced topics in casting, forming, machining and joining; major process parameters; economics of processes.

Prerequisite: I E 217 or E T 217.

I E 382. Business for the Practicing Engineer**3 Credits (3)**

Business tools and skills, including technology commercialization, patent applications, preparing a technology-oriented business plan, reading and constructing financial documents, modeling and understanding markets, e-commerce, QFD, concurrent engineering, engineer's role in the global economy, and engineer's impact on product design and cost.

Prerequisite: engineering major, junior level or above.

I E 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of faculty member.

I E 411. Occupational Safety**3 Credits (3)**

Practical methods to improve safety in the workplace. Topics include OSHA and other regulations, hazard recognition, assessment and control, industry standards, risk assessment and safety management. Material is applicable to a variety of workplace settings. This course is intended for College of Engineering students who have completed their lower-division requirements in mathematics, engineering, technology, and basic science. Same as I E 561 with differential assignments. **Prerequisite:** Junior standing

I E 413. Engineering Operations Research I**3 Credits (3)**

Deterministic operations research modeling including linear and integer programming.

Prerequisite: MATH 1521G or MATH 1521H or ENGR 190.

Corequisite: MATH 480.

Learning Outcomes

1. Ability to model optimization problems that can be solved by linear optimization.
2. Ability to solve linear optimization problems
3. Ability to interpret solutions of linear optimization problems in the context of the larger problem.

I E 423. Engineering Operations Research II**3 Credits (3)**

Probabilistic operations research modeling, including queuing systems and their optimization; Markov chains. May be repeated up to 3 credits.

Prerequisite(s): I E 311.

Corequisite(s): MATH 392.

I E 424. Manufacturing Systems**3 Credits (3)**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling, and inventory control.

Prerequisite: I E 311.

I E 451. Engineering Economy**3 Credits (3)**

Discounted cash flows, economics of project, contract and specifications as related to engineering design.

I E 456. Large Scale Systems Engineering**3 Credits (3)**

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to describe the systems engineering standards and best practices
2. Ability to characterize the limitations of the way that current systems engineering is practiced in terms of dealing with lifecycle uncertainty.

I E 459. Systems Thinking and Decision Making**3 Credits (3)**

A general introduction to systems engineering. Topics include General Systems Theory, Systems Thinking and emerging concepts, Systems Dynamics approaches for modelling and analyzing non-linear feedback mechanisms in complex systems, and Complexity science and complex adaptive systems. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to understand the complexities of engineering systems, and the implications of change on system behavior
2. Ability to understand the nature of complex systems in respect to people, processes, the environment and development organization
3. Ability to understand Systems Thinking's' role and value within organizations
4. Ability to recognize the advantages, as well as the flaws of our present predominant way of thinking (Cartesian), while looking at the changes that would enable us to deal with complex issues in daily practice (Systems Thinking)
5. Ability to recognize the value and limitations of modeling and simulation as well as how to construct and interpret various models to support decision making.

I E 460. Evaluation of Engineering Data**3 Credits (3)**

Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods.

Prerequisite: I E 311 or equivalent.

I E 466. Reliability**3 Credits (3)**

Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data.

Prerequisite: I E 311 or equivalent.

I E 467. Discrete-Event Simulation Modeling**3 Credits (3)**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments. May be repeated up to 3 credits.

Prerequisite(s): I E 311 or equivalent.

I E 468. Advanced Discrete-Event Simulation Applications**3 Credits (3)**

Semester long project involving development and application of advanced simulation skills. May be repeated up to 3 credits.

Prerequisite: I E 467.

Learning Outcomes

1. Ability to understand the techniques of computer simulation modeling in the context of hierarchy of knowledge about a system and develop the capability to apply the same to study systems through available computer simulation software

I E 478. Facilities Planning and Design**3 Credits (3)**

Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies.

Prerequisite(s): I E 316.

Prerequisite(s)/Corequisite(s): I E 424.

I E 480. Senior Design**3 Credits (2+3P)**

Multi-disciplinary team design project for external clients. Involves semester long activities including major design report and presentation.

Prerequisites: senior standing, I E 467.

I E 490. Selected Topics**1-3 Credits**

May be repeated for a maximum of 9 credits.

Prerequisite: consent of the head of the department.

I E 505. Directed Readings**1-3 Credits**

May be repeated for a maximum total of 6 credits.

Prerequisite: consent of the head of the department.

I E 511. Survey of Industrial Engineering**3 Credits (3)**

A project-based course covering methods of engineering, plant layout, production and inventory control, economic analysis, etc. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to apply the various techniques of Industrial Engineering to solve real-life problems

I E 515. Stochastic Processes Modeling**3 Credits (3)**

Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting.

Prerequisites: I E 311 or equivalent; and MATH 392 or equivalent.

I E 522. Queuing Systems**3 Credits (3)**

Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications.

Learning Outcomes

1. Ability to model, analyze, and apply solutions to problems involving queueing systems
2. Ability to read and understand literature in the queueing system analysis field.

I E 523. Advanced Engineering Economy**3 Credits (3)**

Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523.

I E 524. Advanced Production and Inventory Control**3 Credits (3)**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments.

I E 525. Systems Synthesis and Design**3 Credits (3)**

Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities.

I E 530. Environmental Management Seminar**1 Credit (1)**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Same as C E 530, E E 530, CHME 530.

I E 533. Linear Programming**3 Credits (3)**

Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis.

I E 534. Nonlinear Programming**3 Credits (3)**

Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods.

Learning Outcomes

1. Ability to model situations which may be solved by nonlinear optimization and to interpret the results in the context of the larger problem
2. Ability to employ several computer tools to correctly solve nonlinear optimization problems.
3. Ability to read and understand literature in the field of nonlinear optimization
4. Ability to select appropriate methods and algorithms from a core representative set of methods and tools to solve nonlinear optimization problems

I E 535. Discrete Optimization**3 Credits (3)**

Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms.

I E 537. Large Scale Systems Engineering**3 Credits (3)**

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making.

I E 545. Characterizing Time-Dependent Engineering Data**3 Credits (3)**

Theory and techniques employed in the characterization of stochastic processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed.

Learning Outcomes

1. Ability to characterize a process, based on data that is time-dependent or sequential in nature.

I E 561. Advanced Safety Engineering**3 Credits (3)**

Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis.

Prerequisite: graduate status in engineering.

I E 563. Topics in Engineering Administration**3 Credits (3)**

Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.

I E 567. Design and Implementation of Discrete-Event Simulation**3 Credits (3)**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.

I E 571. Advanced Quality Control**3 Credits (3)**

Advanced topics in quality control and design of experiments for improvement of quality.

Prerequisite: I E 311 or equivalent.

I E 575. Advanced Manufacturing Processes**3 Credits (3)**

Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions.

Prerequisite: graduate standing.

I E 590. Selected Topics**1-3 Credits**

May be repeated for a maximum of 9 credits.

Prerequisite: consent of the head of the department.

I E 598. Special Research Programs**1-3 Credits**

Individual analytical or experimental investigations. May be repeated for a maximum total of 6 credits.

Prerequisite: consent of instructor.

I E 599. Master's Thesis**1-15 Credits**

Thesis.

I E 610. Topics in Operations Research**3 Credits (3)**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

I E 620. Topics in Computer Modeling**3 Credits (3)**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

I E 630. Topics in Engineering Management**3 Credits (3)**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

I E 690. Selected Topics**1-15 Credits**

May be repeated.

Prerequisite: consent of department head.**I E 700. Doctoral Dissertation****15 Credits**

Dissertation.

Office Location: 201 Foreman Engineering Complex**Phone:** (575) 646-4923**Fax:** (575) 646-2976**Website:** <http://ie.nmsu.edu/> (<http://ie.nmsu.edu/>)

Industrial Engineering - Bachelor of Science in Industrial Engineering Requirements (121 credits)

In addition to the university requirements for graduation, a student must have at least a 2.0 grade-point average in all departmental courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional & Technical Communication	3
<i>Oral Communication</i>		
COMM 1115G	Introduction to Communication	3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ¹	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G & PHYS 1310L	Calculus-Based Physics I and Calculus-Based Physics I Lab	4
ECON 2110G or ECON 2120G	Macroeconomic Principles Principles of Microeconomics	3
<i>Area V: Humanities ²</i>		
<i>Area VI: Creative and Fine Arts ²</i>		
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World ³		
Departmental/College Requirements		
<i>Program Specific Requirements</i>		
<i>Mathematics</i>		
MATH 1521G will count towards both the General Education Elective requirement and the Mathematics requirement for the department		

MATH 2530G	Calculus III	3
MATH 392	Introduction to Ordinary Differential Equations	3
MATH 480	Applied Linear Algebra	3
or MATH 2415	Introduction to Linear Algebra	
<i>Natural Science Electives</i>		7-8
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
or PHYS 1320G/1320L	Calculus-Based Physics II	

Choose one from the following (3-4 credits):

GEOL 1110G	Physical Geology	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
PHYS 2120	Heat, Light, and Sound	

Engineering Core

ENGR 110	Introduction to Engineering Design	3
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
CHME 361	Engineering Materials	3

Capstone Course

ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3

Industrial Engineering Topics Electives

Choose two 3 credit Industrial Engineering topics courses, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools: At least one course must be numbered 300 and above ⁴

Industrial Engineering

I E 151	Computational Methods in Industrial Engineering	3
I E 217	Manufacturing Processes	3
I E 311	Engineering Data Analysis	3
I E 316	Methods Engineering	3
I E 351	Applied Problem Solving in Industrial Engineering	3
I E 365	Quality Control	3
I E 413	Engineering Operations Research I	3
I E 423	Engineering Operations Research II	3
I E 424	Manufacturing Systems	3
I E 451	Engineering Economy	3
I E 460	Evaluation of Engineering Data	3
I E 467	Discrete-Event Simulation Modeling	3
I E 478	Facilities Planning and Design	3

Second Language: (not required)

Electives, to bring the total credits to 121	0
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Total Credits	121-122
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¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Students are required to see the advisor for more detailed information about selecting the Industrial Engineering Topics Elective Courses that are approved to fulfill this requirement.

A Suggested Plan of Study for Students

This roadmap is a semester-by-semester planning guide for Industrial Engineering major. It assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from semester to semester and may be subject to modification or change. Roadmaps should be reviewed in consultation with your advisor.

First Year

Fall		Credits
ENGL 1110G	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I ¹	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 190	Introduction to Engineering Mathematics	4
Credits		16

Spring

MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
I E 151	Computational Methods in Industrial Engineering	3
Area V: Humanities Course ²		3
ENGR 110	Introduction to Engineering Design	3
Credits		17

Second Year

Fall		
Choose one from the following:		4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
MATH 2530G	Calculus III	3
ENGR 233	Engineering Mechanics I	3
ENGL 2210G	Professional & Technical Communication	3
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Spring

ECON 2110G or ECON 2120G	Macroeconomic Principles or Principles of Microeconomics	3
CHME 361	Engineering Materials	3
I E 217	Manufacturing Processes	3
I E 311	Engineering Data Analysis	3
COMM 1115G	Introduction to Communication	3
Credits		15

Third Year

Fall		
MATH 392	Introduction to Ordinary Differential Equations	3
I E 316	Methods Engineering	3
I E 351	Applied Problem Solving in Industrial Engineering	3
I E 365	Quality Control	3
Industrial Engineering Topics Elective ³		3
Credits		15

Spring

I E 423	Engineering Operations Research II	3
I E 424	Manufacturing Systems	3
I E 451	Engineering Economy	3
I E 460	Evaluation of Engineering Data	3
MATH 480 or MATH 2415	Applied Linear Algebra or Introduction to Linear Algebra	3
Credits		15

Fourth Year

Fall

I E 413	Engineering Operations Research I	3
I E 467	Discrete-Event Simulation Modeling	3
ENGR 401	Engineering Capstone I	3
Choose one from the following:		3-4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
GEOL 1110G	Physical Geology	
PHYS 2120	Heat, Light, and Sound	
Viewing A Wider World Course ⁴		3
Credits		15-16

Spring

I E 478	Facilities Planning and Design	3
Industrial Engineering Topics Elective ³		3
ENGR 402	Engineering Capstone II	3
Viewing A Wider World Course ⁴		3
Credits		12
Total Credits		121-122

- ¹ MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree but students may need to complete any prerequisites prior to enrolling in this course depending on math placement.
- ² See the General Education (p. 220) Section of the catalog for a full list of courses.
- ³ See your adviser for more detailed information about selecting the Industrial Engineering Topics Elective Course that is approved to fulfill this requirement.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

Entrepreneurship - Undergraduate Minor

The Entrepreneurship Minor is designed to promote entrepreneurship to students across the NMSU campus. The Department of Industrial Engineering coordinates an engineering cluster of electives to support the three required classes offered by the College of Business.

Prefix	Title	Credits
Entrepreneurship		
BLAW 330	Entrepreneurial Law	3
ENTR 331	Business Creation and Valuation	3
MGMT 310V	Entrepreneurial Mindset	3
Engineering Electives		9
Select three classes from the following:		
CHME 449	Intellectual Property for Engineers and Scientists	
E T 480	Innovation and Product Development	

I E 382

Business for the Practicing Engineer

Total Credits

18

Lean Manufacturing and Analytics - Undergraduate Minor

Prefix	Title	Credits
Course Requirements		
<i>Required Courses</i>		
I E 316	Methods Engineering	3
I E 490	Selected Topics (Lean tools in Systems Engineering)	3
<i>Technical Elective Courses (Choose 6 credits from the following)</i>		6
Track One - Data Analytics		
I E 311	Engineering Data Analysis	
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
I E 351	Applied Problem Solving in Industrial Engineering	
I E 460	Evaluation of Engineering Data	
STAT 470	Probability: Theory and Applications	
BCIS 461	Business Analytics I	
C S 488	Introduction to Data Mining	
Track Two - Manufacturing Systems		
I E 375	Manufacturing Processes II	
I E 217	Manufacturing Processes	
E T 217	Manufacturing Processes	
M E 222	Introduction to Product Development	
I E 478	Facilities Planning and Design	
E T 480	Innovation and Product Development	
MGMT 344	Production and Operations Management	
Track Three - Quality Control		
I E 365	Quality Control	
I E 466	Reliability	
I E 490	Selected Topics (Introduction to Advanced Manufacturing)	
C E 498	Special Topics (Introduction to Nondestructive Testing)	
<i>Applications in Engineering & Business (Choose 6 credits from the following)</i> ¹		6
A E Courses 400-level (With approval of advisor and instructor)		
C E Courses 400-level (With approval of advisor and instructor)		
CHME Courses 400-level (With approval of advisor and instructor)		
E E Courses 400-level (With approval of advisor and instructor)		
E T Courses 400-level (With approval of advisor and instructor)		
I E Courses 400-level (With approval of advisor and instructor)		
M E Courses 400-level (With approval of advisor and instructor)		
BCIS Courses 400-level (With approval of advisor and instructor)		
MGMT Courses 400-level (With approval of advisor and instructor)		
C S Courses 400-level (With approval of advisor and instructor)		
A ST Courses 400-level (With approval of advisor and instructor)		
Total Credits		18

enr.nmsu.edu/students/Fifth-page.html) (requires department head approval)

Supply Chain and Operations Research Analytics - Undergraduate Minor

Prefix	Title	Credits
Course Requirements		
<i>Required Courses</i>		
MGMT 351	Supply Chain Management	3
<i>Choose 3 credits from the following</i>		3
I E 413	Engineering Operations Research I	
I E 467	Discrete-Event Simulation Modeling	
<i>Technical Elective Courses (Choose 6 credits from the following)</i>		6-7
Track One - Data Analytics		
I E 311	Engineering Data Analysis	
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
I E 460	Evaluation of Engineering Data	
STAT 470	Probability: Theory and Applications	
E E 465	Machine Learning I	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
BCIS 475	Database Management Systems	
C S 482	Database Management Systems I	
C S 488	Introduction to Data Mining	
C S 272	Introduction to Data Structures	
Track Two - Optimization		
I E 423	Engineering Operations Research II	
I E 424	Manufacturing Systems	
CHME 392	Numerical Methods in Engineering	
C S 278	Discrete Mathematics for Computer Science	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning	
Track Three - Computer Programming and Applications		
I E 351	Applied Problem Solving in Industrial Engineering	
BCIS 321	Introduction to Software Development and Programming	
ICT 352	Software Technology I	
C S 271	Object Oriented Programming	
C S 273	Machine Programming and Organization	
C S 372	Data Structures and Algorithms	
C S 343	Algorithm Design & Implementation	
<i>Applications in Engineering & Business (Choose 6 credits from the following)</i> ¹		6
A E Courses 400-level (With approval of advisor and instructor)		
C E Courses 400-level (With approval of advisor and instructor)		
CHME Courses 400-level (With approval of advisor and instructor)		
E E Courses 400-level (With approval of advisor and instructor)		
E T Courses 400-level (With approval of advisor and instructor)		
I E Courses 400-level (With approval of advisor and instructor)		
M E Courses 400-level (With approval of advisor and instructor)		
ACCT Courses 400-level (With approval of advisor and instructor)		

¹ Courses numbered 450 or above may be used to satisfy course requirements for the Master's Accelerated Program (<https://>

BCIS Courses 400-level (With approval of advisor and instructor)
BFIN Courses 400-level (With approval of advisor and instructor)
MGMT Courses 400-level (With approval of advisor and instructor)
C S Courses 400-level (With approval of advisor and instructor)
A ST Courses 400-level (With approval of advisor and instructor)

Total Credits **18-19**

¹ Courses numbered 450 or above may be used to satisfy course requirements for the Master's Accelerated Program (<https://engr.nmsu.edu/students/Fifth-page.html>) (requires department head approval)

Systems Engineering - Undergraduate Minor

Prefix	Title	Credits
Course Requirements		
<i>Required Courses</i>		
I E 490	Selected Topics (Systems Engineering)	3
I E 456	Large Scale Systems Engineering	3
<i>Technical Elective Courses (Choose 6 credits from the following)</i>		
Track One - Data Analysis, Optimization & Simulation Modeling		
I E 311	Engineering Data Analysis	
A ST 311	Statistical Applications	
STAT 371	Statistics for Engineers and Scientists I	
I E 413	Engineering Operations Research I	
I E 423	Engineering Operations Research II	
I E 460	Evaluation of Engineering Data	
STAT 470	Probability: Theory and Applications	
I E 467	Discrete-Event Simulation Modeling	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
C S 278	Discrete Mathematics for Computer Science	
C S 343	Algorithm Design & Implementation	
C S 372	Data Structures and Algorithms	
C S 488	Introduction to Data Mining	
Track Two - Manufacturing System		
I E 217	Manufacturing Processes	
E T 217	Manufacturing Processes	
M E 222	Introduction to Product Development	
I E 365	Quality Control	
I E 375	Manufacturing Processes II	
I E 424	Manufacturing Systems	
I E 466	Reliability	
I E 490	Selected Topics (Lean tools in Systems Engineering)	
I E 490	Selected Topics (Introduction to Advanced Manufacturing)	
A E 424	Aerospace Systems Engineering	
E E 333	AC Circuit Analysis and Introduction to Power Systems	
E E 431	Power Systems II	
M E 210	Electronics and System Engineering	
Track Three - Business		
I E 382	Business for the Practicing Engineer	
I E 451	Engineering Economy	

C E 477	Engineering Economics and Construction Management	
E T 480	Innovation and Product Development	
CHME 449	Intellectual Property for Engineers and Scientists	
ENTR 331	Business Creation and Valuation	
<i>Applications in Engineering & Business (Choose 6 credits from the following)</i> ¹		6
A E Courses 400-level (With approval of advisor and instructor)		
C E Courses 400-level (With approval of advisor and instructor)		
CHME Courses 400-level (With approval of advisor and instructor)		
E E Courses 400-level (With approval of advisor and instructor)		
I E Courses 400-level (With approval of advisor and instructor)		
M E Courses 400-level (With approval of advisor and instructor)		
ACCT Courses 400-level (With approval of advisor and instructor)		
BCIS Courses 400-level (With approval of advisor and instructor)		
BFIN Courses 400-level (With approval of advisor and instructor)		
MGMT Courses 400-level (With approval of advisor and instructor)		
C S Courses 400-level (With approval of advisor and instructor)		
A ST Courses 400-level (With approval of advisor and instructor)		

Total Credits **18**

¹ Courses numbered 450 or above may be used to satisfy course requirements for the Master's Accelerated Program (<https://engr.nmsu.edu/students/Fifth-page.html>) (requires department head approval)

Mechanical Engineering and Aerospace Engineering Undergraduate Program Information

The mission of the Mechanical and Aerospace Engineering Department at New Mexico State University is threefold:

- to educate those who will advance knowledge and become the future leaders of industry and academia;
- to conduct both basic and applied research in mechanical and aerospace engineering and related interdisciplinary areas; and
- to provide service to the profession, to the State of New Mexico, to the country, and to the future development of engineering worldwide.

A critical focus within the department is to afford undergraduates of varying backgrounds and abilities every opportunity for achieving success in the mechanical and aerospace engineering professions. To address this focus, the faculty of the Mechanical and Aerospace Engineering Department, with input from other constituents, have established the following program educational objectives that inform the overall undergraduate programs:

- Our graduates will gain relevant employment and/or pursue a graduate degree.
- Our graduates will advance in their level of workplace responsibility.

Graduate Program Information

Graduate programs of study are available leading to the degrees of

- Doctor of Philosophy in Aerospace Engineering
- Doctor of Philosophy in Engineering with a concentration in Mechanical Engineering.
- Master of Science in Aerospace Engineering,
- Master of Science in Mechanical Engineering,
- Master of Engineering in Aerospace Engineering,
- Master of Engineering in Mechanical Engineering.

Areas of active research in mechanical engineering include the following:

- Computational fluid dynamics,
- Hypersonics,
- Vortex dynamics,
- Energy systems and components,
- Thermal management,
- Surface engineering,
- Computational mechanics with application to material properties,
- Composite materials and nanomaterials,
- Structural damage diagnosis and prognosis,
- Nonlinear dynamics and vibration,
- Reduced order modeling in multibody dynamics,
- Fluid-structure interactions,
- Renewable energy / energy harvesting,
- Bio-inspired and bio-mimetic robotics,
- Advanced manufacturing and medical device.

Areas of active research in aerospace engineering include the following:

- Computational, theoretical, and experimental fluid dynamics,
- Hypersonics,
- Flow control,
- Multi-phase, multi-scale, and reacting flows,
- Rarefied gas dynamics,
- Propulsion,
- Aeroelasticity,
- Structural health monitoring / damage detection,
- Guidance, navigation, and control of space systems,
- Small satellite missions,
- Unmanned aerial systems.

Laboratory facilities supporting graduate research include a large low-speed wind tunnel facility; a shock tunnel facility for hypersonics; computational fluid dynamics lab; robotics, unmanned vehicles, and intelligent systems control lab; autonomous systems lab; mechanical design and advanced materials & structures lab; nonlinear dynamics & energy harvesting lab; computational mechanics of materials and structures lab; non-destructive evaluation lab; medical device & microfabrication research lab; surface-environment interaction research lab; and renewable energy and thermal systems lab. A mechanical testing lab is also available in the College of Engineering.

In addition to fulfilling the basic requirements for admission to the Graduate School, applicants are expected to have an undergraduate degree equivalent to a BS in mechanical or aerospace engineering from a university accredited by ABET. Graduate students whose BS degree is in a discipline other than A E or M E will normally be required to take undergraduate courses in M E or A E in order to prepare for graduate course work; such undergraduate preparatory work will be determined

by the graduate coordinator on a case by case basis. A candidate for the master's degree can choose one of two options: a thesis option or a course-only option. Both options require a minimum of 30 credits of graduate study.

Doctoral candidates must complete a program of study determined by the student and his or her advisory committee. The student must successfully pass a written qualifying examination (administered during the student's first year of full-time study) and an oral comprehensive examination administered after approximately 80 percent of the course work is completed. The student must submit and defend an acceptable dissertation based on independent investigation in a field of study approved by the advisory committee. The requirements for the MS and Ph.D. degrees are stated below.

Degrees for the Department

Bachelor Degree(s)

- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 1071)
- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 1073)

Master Degree(s)

- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 90)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/aerospace-engineering-meae-online/>)
- Aerospace Engineering - Master of Science (p. 90)
- Mechanical Engineering - Master of Engineering (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/mechanical-engineering-meme-online/>)
- Mechanical Engineering - Master of Engineering in Mechanical Engineering (p. 155)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 156)

Doctoral Degree(s)

- Aerospace Engineering - Doctor of Philosophy (p. 173)
- Engineering (Mechanical Engineering) - Doctor of Philosophy (p. 191)

Minors for the Department

- Aerospace Engineering - Undergraduate Minor (p. 1074)
- Mechanical Engineering - Undergraduate Minor (p. 1075)

Department Head: Jay Frankel, Ph. D.

Associate Department Head: Young Lee, Ph. D.

Professors Chaitanya, Frankel, Y. Park; **Associate Professors** Abdelkefi, Drach, Garcia, Gross, Kota, Kuravi, Lee, Shashikanth, Shu, Sun; **Assistant Professors** Alaie, Haghsheenas-Jaryani, Liu, H. Park, Wang; **Professors of Practice** Waller

A. Abdelkefi, Ph.D. (Virginia Tech)– *Nonlinear dynamics, energy harvesting, aeroelasticity, fluid-structure interaction, vibration and controls*; S. Alaie, Ph.D. (UNM)– *Implantable microsensors, advanced manufacturing and medical devices*; V. Chaitanya, Ph.D. (Johns Hopkins)– *Materials characterization, materials degradation, corrosion, electrochemistry, failure analysis, energy,*

bioengineering, additive manufacturing, food-energy-water nexus; B. Drach, Ph.D. (New Hampshire)– Composite materials, additive manufacturing, biomechanics; J. Frankel, Department head, Ph.D. (Virginia Tech)– Heat transfer, hypersonics; G. Garcia, Ph.D. (Texas A&M)– Damage detection, experimental mechanics, vibration; A. Gross, DEngr. (Aachen)– Computational fluid dynamics, fluid mechanics, aircraft design and propulsion, unmanned aerial systems, wind energy; M. Haghsheenas-Jaryani, Ph.D. (UT Arlington)– Soft robotics, bio-inspired and bio-mimetic robotics, dynamics and control; K. Kota, Ph.D. (Central Florida)– Heat transfer, functional surfaces, surface-environment interactions, thermal management, space transportation, engineering in public health and medicine; S. Kuravi, Ph.D. (Central Florida)– Renewable energy, thermal systems, concentrating solar power, thermal desalination, energy storage; Y. Lee, Associate Department Head, Ph.D. (Illinois Urbana-Champaign)– Nonlinear dynamics, fluid-structure interactions; Q. Liu, Ph.D. (Universidad Politécnica de Madrid, Spain)– Computational fluid mechanics, modal analysis, data science, rarefied gas dynamics and multiphase flow; Y. Park, Ph.D. (Iowa)– Design optimization, computational solid mechanics, atomistic and molecular simulations; H. Park, Ph.D. (Michigan)– Space robotics, optimal control, small satellites; B. Shashikanth, Ph.D. (Southern California)– Fluid mechanics, dynamical systems, controls; F. Shu, Ph.D. (Purdue)– Experimental fluid dynamics, biofluidics, microfluidics, flow control, and hypersonics; L. Sun, Ph.D. (Brigham Young)– Unmanned systems, towed cable systems, sensor network, cooperative estimation and control, optimal control; J. Waller, Ph.D. (U Akron)– Nondestructive evaluation, additive manufacturing and materials; Y. Wang, Ph.D. (Penn State)– Computational fluid dynamics, multi-phase & reacting flows, aerospace propulsion, bio/micro-Fluidics.

Aerospace Engineering Courses

A E 339. Aerodynamics I

3 Credits (3)

Fluid properties, conservation equations, incompressible 2-dimensional flow; Bernoulli's equation; similarity parameters; subsonic aerodynamics: lift and drag, analysis and design of airfoils. May be repeated up to 3 credits.

Prerequisite: C- or better grades in ENGR 234 and (M E 228 or MATH 392).

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to design and conduct experiments, as well as to analyze and interpret data;
3. Ability to design a system, component or process to meet desired needs within realistic constraints;
4. Ability to identify, formulate, and solve engineering problems.

A E 362. Orbital Mechanics

3 Credits (3)

Dynamics of exoatmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 392), ENGR 234, and M E 261.

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to identify, formulate, and solve engineering problems;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

A E 363. Aerospace Structures

3 Credits (3)

Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques. May be repeated up to 3 credits.

Prerequisite: C- or better grades in C E 301.

Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

A E 364. Flight Dynamics and Controls

3 Credits (3)

Fundamentals of airplane flight dynamics, static trim, and stability; spacecraft and missile six degree of freedom dynamics; attitude control of spacecraft. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 392), ENGR 234, and M E 261.

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to identify, formulate, and solve engineering problems;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

A E 400. Undergraduate Research

1-3 Credits (1-3)

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisite(s): Consent of faculty member.

A E 405. Special Topics

3 Credits (3)

Topics of modern interest to be offered by the departmental staff. Consent of instructor required.

A E 419. Propulsion

3 Credits (3)

Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in A E 439.

Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

A E 424. Aerospace Systems Engineering**3 Credits (3)**

Basic principles of top down systems engineering and current practice; preliminary and detailed design of aircraft and space vehicles, including requirement, subsystem interaction, and integration, tradeoffs, constraints and non-technical aspects. May be repeated up to 3 credits.

Prerequisite: C- or better grades in A E 362.

Learning Outcomes

1. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
2. an ability to communicate effectively with a range of audiences
3. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
4. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

A E 428. Aerospace Capstone Design**3 Credits (3+2P)**

Team Project-analysis, design, hands-on build test, evaluate.

Prerequisite(s)/Corequisite(s): A E 447. **Prerequisite(s):** A E 363 and A E 424.

A E 439. Aerodynamics II**3 Credits (3)**

Principles of compressible flow, momentum and energy conservation; thermal properties of fluids; supersonic flow and shock waves; basics of supersonic aerodynamics. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (A E 339 or M E 338), M E 240, and M E 328.

Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

A E 447. Aerofluids Laboratory**3 Credits (2+3P)**

Use of subsonic wind tunnels and other flow to study basic flow phenomena and methods of fluid measurement and visualization.

Prerequisite(s)/Corequisite(s): A E 439. **Prerequisite(s):** M E 345.

A E 451. Aircraft Design**3 Credits (3)**

Conceptual design of aircraft based on existing designs, empirical relationships, and theory. Dimensioning, structural design, and performance analysis of major subcomponents such as fuselage, wing, and propulsion system. Static stability and control analysis.

Prerequisite(s): A E 339 and A E 363.

A E 452. Control System Design**3 Credits (3)**

Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.

Prerequisite: M E 261, M E 328 and ENGR 234.

Learning Outcomes

1. Construct a block diagram to find a transfer function for a dynamical system;
2. Analyze control systems by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques;
3. Design and simulate automatic control systems for mechanical and aerospace engineering applications.

A E 464. Advanced Flight Dynamics and Controls**3 Credits (3)**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile/rocket control systems, and guidance systems.

Prerequisite(s): A E 364 or consent of instructor.

A E 509. Individualized Study**3 Credits (3)**

Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to A E & M E majors.

A E 510. Special Topics**1-6 Credits (1-6)**

Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.

A E 527. Linear Systems Theory**3 Credits (3)**

Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer. May be repeated up to 3 credits.

Learning Outcomes

1. Students are able to design linear multi-input-multi-output (MIMO) control systems.

A E 533. Numerical Methods for Computational Fluid Mechanics and Heat Transfer**3 Credits (3)**

Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data. May be repeated up to 3 credits.

Prerequisite: M E 530.

Learning Outcomes

1. An ability to apply fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior.

A E 564. Advanced Flight Dynamics and Controls**3 Credits (3)**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile / rocket control systems, and guidance systems May be repeated up to 3 credits.

Prerequisite(s): A E 364 or consent of instructor.

A E 598. Special Research Programs**1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to A E & M E majors.

A E 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. Graded: Thesis/Dissertation.

A E 600. Doctoral Research**1-15 Credits (1-15)**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Dissertation.

A E 700. Doctoral Dissertation**15 Credits (15)**

Dissertation. Graded: Thesis/Dissertation.

Mechanical Engineering Courses

M E 159. Graphical Communication and Design**2 Credits (1+3P)**

Sketching and orthographic projection. Covers detail and assembly working drawings, dimensioning, tolerance specification, and design projects.

Prerequisite(s)/Corequisite(s): MATH 1250G.

M E 210. Electronics and System Engineering**3 Credits (2+3P)**

Introduction to microcontrollers, measurement systems, motion actuators, sensors, electric circuits, and electronic devices and interfacing. Students required to work individually and in teams to design and test simple electromechanical systems. Restricted to Las Cruces campus only. May be repeated up to 3 credits.

Prerequisite: C- or better grade in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to apply knowledge if mathematics, science, and engineering;
2. Ability to design and conduct experiments, as well as to analyze and interpret data;
3. Ability to design a system, component or process to meet desired needs within realistic constraints;
4. Ability to identify, formulate, and solve engineering problems;
5. Ability to use the techniques, skills and modern tools necessary for engineering practice.

M E 222. Introduction to Product Development**3 Credits (2+3P)**

Introduction to modern methods used in the realization of products. Traditional manufacturing processes, such as metal stamping, turning, milling, and casting are reviewed. Modern methods of rapid prototyping and model making are discussed in context of computer-aided design. Techniques for joining metals, plastics, and composites are discussed. Role of quality control is introduced. May be repeated up to 3 credits.

Prerequisite: C- or better grades in ENGR 110.

Learning Outcomes

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

M E 228. Engineering Analysis I**3 Credits (3)**

Introduction to engineering analysis with emphasis on engineering applications. Topics include ordinary differential equations, linear algebra, and vector calculus with focus on analytical methods. May be repeated up to 3 credits.

Prerequisite: C- or better grades in MATH 2530G.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

M E 234. Mechanics-Dynamics**3 Credits (3)**

Kinematics and dynamic behavior of solid bodies utilizing vector methods.

Prerequisite(s)/Corequisite(s): MATH 2530G. Prerequisite(s): C E 233.

M E 236. Engineering Mechanics I**3 Credits (3)**

Force systems, resultants, equilibrium, distributed forces, area moments, friction, and kinematics of particles. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): PHYS 1310G. Prerequisite(s): MATH 1521G or MATH 1521H.

M E 237. Engineering Mechanics II**3 Credits (3)**

Kinetics of particles, kinematics and kinetics rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies in three dimensions. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 2530G. Prerequisite(s): M E 236.

M E 240. Thermodynamics**3 Credits (3)**

First and second laws of thermodynamics, irreversibility and availability, applications to pure substances and ideal gases. May be repeated up to 3 credits.

Prerequisite: C- or better grades in PHYS 1310G.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

M E 261. Mechanical Engineering Problem Solving**3 Credits (2+3P)**

Introduction to programming syntax, logic, and structure. Numerical techniques for root finding, solution of linear and nonlinear systems of equations, integration, differentiation, and solution of ordinary differential equations will be covered. Multi function computer algorithms will be developed to solve engineering problems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to identify, formulate, and solve engineering problems;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

M E 326. Mechanical Design**3 Credits (3)**

Design methodology and practice for mechanical engineers. May be repeated up to 3 credits.

Prerequisite: C- or better in ENGR 234 and C E 301.

Learning Outcomes

1. Ability to design a system, component or process to meet desired needs within realistic constraints;
2. Ability to function on multidisciplinary teams;
3. Understanding of professional and ethical responsibility;
4. Knowledge of contemporary issues.

M E 328. Engineering Analysis II**3 Credits (3)**

Advanced engineering analysis with emphasis on engineering applications. Topics include systems of ordinary differential equations, Fourier analysis, partial differential equations, and functions of complex variable with focus on analytical methods. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 228.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

M E 331. Intermediate Strength of Materials**3 Credits (3)**

Covers stress and strain, theories of failure, curved flexural members, flat plates, pressure vessels, buckling, and composites. May be repeated up to 3 credits.

Prerequisite(s): C E 301 and M E 328.

M E 332. Vibrations**3 Credits (3)**

Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange's equations. Dynamic stability. Controls. Matrix iteration. May be repeated up to 3 credits.

Prerequisite: M E 328, ENGR 234, and M E 261.

Learning Outcomes

1. An ability to analyze free and forced vibrations of a single degree-of-freedom (DOF) to multi-DOF systems; and an ability to perform modal analysis for engineering structures to understand mechanical vibrations in terms of normal modes.

M E 333. Intermediate Dynamics**3 Credits (3)**

Three dimensional kinematics and kinetics, orbital motion, Lagrange's equations, dynamic stability, and controls. May be repeated up to 3 credits.

Prerequisite: M E 328 and ENGR 234.

Learning Outcomes

1. An ability to derive and solve equations of motion for a dynamical system by means of analytical mechanics approach.

M E 338. Fluid Mechanics**3 Credits (3)**

Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations continuity, energy, and momentum to fluid systems. May be repeated up to 3 credits.

Prerequisite: C- or better grade in ENGR 234 and in (M E 228 or MATH 392).

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to design and conduct experiments, as well as to analyze and interpret data;
3. Ability to design a system, component or process to meet desired needs within realistic constraints;
4. Ability to identify, formulate, and solve engineering problems.

M E 340. Applied Thermodynamics**3 Credits (3)**

Thermodynamic cycles, Maxwell relations, Gibbs and Helmholtz functions, mixtures, psychometrics, chemical reactions, chemical equilibrium. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 240.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

M E 341. Heat Transfer**3 Credits (3)**

Fundamentals of conduction, convection, and radiation. Design of heat transfer systems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 240 and in (M E 338 or A E 339).

Learning Outcomes

1. Students have the ability to apply knowledge of mathematics, science, and engineering;
2. Students have the ability to identify, formulate, and solve engineering problems.

M E 345. Experimental Methods I**3 Credits (2+3P)**

Emphasis on experimental techniques, basic instrumentation, data acquisition and analysis, and written presentation of results. Includes experiments in dynamics and deformable body mechanics. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 392), in (M E 210 or PHYS 2140), and in ENGR 234.

Prerequisite/Corequisite: C E 301.

Learning Outcomes

1. Ability to design and conduct experiments, as well as to analyze and interpret data;
2. Ability to communicate effectively;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

M E 349. MAE Career Seminar**1 Credit (1)**

Seminar course covering topics relevant to mechanical and aerospace engineering juniors (job placement, interviewing techniques, resume preparation, etc.). Restricted to: M E and A E majors.

Prerequisite(s): Junior Standing.

M E 400. Undergraduate Research**1-3 Credits**

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of faculty member.

M E 401. Heating and Air-Conditioning Systems**3 Credits (3)**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 306.

Prerequisite/Corequisite: E T 396.

Learning Outcomes

1. Master the use of thermodynamics software, EES for this course, and design software, HVAC Calc for this course.
2. Understand the principles of indoor/outdoor psychrometrics.
3. Calculate the heating/cooling loads.
4. Design/size an HVAC system for a given building through a class project.

M E 405. Special Topics**3 Credits (3)**

Topics of modern interest to be offered by the departmental staff. May be repeated up to 12 credits.

Prerequisite(s): Senior standing.

M E 425. Design of Machine Elements**3 Credits (3)**

Design of machine elements through the application of mechanics. Fatigue and theories of failure. Design projects assigned. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 326.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

M E 426. Design Project Laboratory I**3 Credits (6P)**

Students address a design problem in which innovation and attention to detail are emphasized. Solution of the problem entails applications of mechanics and/or the thermal sciences.

Prerequisite(s)/Corequisite(s): M E 425.

M E 427. Design Project Laboratory II**3 Credits (6P)**

Continuation of M E 426.

Prerequisite: M E 426.

M E 445. Experimental Methods II**3 Credits (2+3P)**

Emphasis on experimental techniques, instrumentation and data acquisition in fluid mechanics, heat transfer, and thermodynamics. Laboratory results will be presented in written and verbal formats. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 338 or A E 339), M E 340, M E 341, and M E 345.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to communicate effectively with a range of audiences
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

M E 449. Mechanical Engineering Senior Seminar**1 Credit (1)**

Senior seminar course covering topics relevant to graduating mechanical engineering seniors (job placement, interviewing techniques, resume preparation).

Prerequisite: senior standing.

M E 452. Control System Design**3 Credits (3)**

Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.

Prerequisite: M E 261, M E 328 and ENGR 234.

Learning Outcomes

1. Construct a block diagram to find a transfer function for a dynamical system;
2. Analyze control systems by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques;
3. Design and simulate automatic control systems for mechanical and aerospace engineering applications.

M E 456. Experimental Modal Analysis**3 Credits (3)**

Emphasis on hands-on techniques for structural vibration tests for practical applications. Interpretation of experimental results by means of advanced signal processing tools, basic system identification methodology, and reduced-order modeling procedures. May be repeated up to 3 credits.

Prerequisite: M E 328 and M E 261.

Learning Outcomes

1. An ability to experimentally perform modal analysis for multi-degree-of-freedom systems, which can be extended to continuous systems and actual engineering structures.

M E 457. Engineering Failure Analysis**3 Credits (3)**

Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn how to systematically conduct failure analysis, identify cause(s) of failure, suggest remedial steps to prevent failures and/or improve performance for a variety of engineering applications involving metals, polymers, ceramics and composites.

M E 458. Properties and Mechanical Behavior of Materials**3 Credits (3)**

Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture.

Learning Outcomes

1. Students will learn how to correlate mechanical behavior of materials with their microstructure, processing history and composition.
2. As practicing engineers, they will be able to recognize impact of operating conditions, predict life span, and design materials to improve reliability and efficiency.
3. They will be able to select appropriate materials for a given application from class of materials such as metals, polymers, ceramics and composites.

M E 460. Applied Finite Elements**3 Credits (3)**

Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process. May be repeated up to 3 credits. Crosslisted with: M E 518.

Prerequisite(s): M E 425.

M E 481. Alternative and Renewable Energy**3 Credits (3)**

Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed. May be repeated up to 3 credits.

Prerequisite: M E 341.

Learning Outcomes

1. Understanding of current and future energy needs of the United States and the whole world from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass.

M E 486. Introduction to Robotics**3 Credits (3)**

This course provides students with an introduction to the theories and methods for analysis, design, and control of robotic manipulators. This course is devoted to understanding the spatial descriptions and transformations, kinematics, and dynamics of these mechanisms and how to practically implement these concepts into actual robotic manipulators. May be repeated up to 3 credits.

Prerequisite: M E 328 and ENGR 234.

Learning Outcomes

1. Model and analyze the kinematics and dynamics of robotic manipulators;
2. Program and control these robotic platforms;
3. Apply the theoretical methods into industrial robots;
4. Implement the knowledge and experiences in real-world engineering projects.

M E 487. Mechatronics**3 Credits (2+3P)**

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. May be repeated up to 3 credits.

Prerequisite(s): M E 210 and M E 345.

M E 502. Elasticity I**3 Credits (3)**

Introduction to stress tensor, strain tensor, constitutive law, energy theorems, plane stress and plane strain. Also covers torsion of shafts and propagation of stress waves in elastic solids.

M E 503. Thermodynamics**3 Credits (3)**

A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.

M E 504. Continuum Mechanics**3 Credits (3)**

Basic introduction to the Mechanics of Continuous Media. Its aim is to prepare the student for more advanced courses in Solid and Fluid Mechanics. The topics to be covered include: introduction to Cartesian tensors, tensor algebra and calculus; Lagrangian and Eulerian kinematics; Cauchy and Piola-Kirchhoff stresses; general principles of conservation; constitutive theory for ideal fluids, Newtonian and non-Newtonian fluids, finite and linear elasticity.

M E 509. Individualized Study**3 Credits (3)**

Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.

M E 510. Special Topics**1-6 Credits**

Topics in mechanical engineering. May be repeated for a maximum of 6 credits.

Prerequisite: consent of the department head.

M E 511. Dynamics**3 Credits (3)**

An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics.

M E 512. Vibrations**3 Credits (3)**

Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.

M E 517. Nonlinear Dynamics and Chaos**3 Credits (3)**

Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincaré maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos

M E 518. Finite Element Analysis**3 Credits (3)**

Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis. May be repeated up to 3 credits. Crosslisted with: M E 460.

M E 527. Linear Systems Theory**3 Credits (3)**

Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer. May be repeated up to 3 credits.

Learning Outcomes

1. Students are able to design linear multi-input-multi-output (MIMO) control systems.

M E 530. Intermediate Fluid Mechanics**3 Credits (3)**

Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.

M E 533. Numerical Methods for Computational Fluid Mechanics and Heat Transfer**3 Credits (3)**

Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data. May be repeated up to 3 credits.

Prerequisite: M E 530.

Learning Outcomes

1. An ability to apply fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior.

M E 536. Hydrodynamic Stability and Turbulence**3 Credits (3)**

Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory May be repeated up to 3 credits.

Prerequisite: ME 530.

Learning Outcomes

1. An ability to understand fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory.

M E 540. Intermediate Heat Transfer**3 Credits (3)**

Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level.

M E 557. Engineering Failure Analysis**3 Credits (3)**

Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects. May be repeated up to 3 credits.

M E 558. Properties and Mechanical Behavior of Materials**3 Credits (3)**

Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture. May be repeated up to 3 credits.

Prerequisite: CHME 361.

M E 570. Engineering Analysis I**3 Credits (3)**

Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods.

M E 580. Engineering Analysis II**3 Credits (3)**

Engineering analysis with emphasis on engineering applications. Topics include analytical and numerical methods in linear and nonlinear ordinary and partial differential equations.

Prerequisite: M E 570 or consent of instructor.

M E 587. Mechatronics**3 Credits (2+3P)**

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. Crosslisted with: M E 487.

M E 598. Special Research Programs**1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.

M E 599. Master's Thesis**15 Credits**

Thesis.

M E 600. Doctoral Research**1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

M E 698. Special Research Programs**1-3 Credits**

May be repeated for a maximum of 6 credits.

M E 700. Doctoral Dissertation**15 Credits**

Dissertation.

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Aerospace Engineering - Bachelor of Science in Aerospace Engineering

The aerospace engineering program prepares students for a range of professional engineering careers in aerospace and related professions. The aerospace engineering curriculum covers the important classical areas of low and high speed aerodynamics, propulsion, orbital mechanics, flight mechanics and control, aerospace structures and laboratory practice. In addition, the principles of systems engineering and design that are necessary to conceive, design, analyze and troubleshoot complex engineering systems are covered extensively and are considered to be especially important in the overall educational experience. Students will also be encouraged to participate in significant non-classroom experiences, including:

- co-ops and internships;
- industrial and laboratory field trips;
- guest speakers from outside NMSU;
- the New Mexico Space Grant Program;
- special seminar programs on current topics in aerospace.

Aerospace engineers find employment in areas of launch vehicles, space vehicles and missions, aircraft systems design, land and sea vehicle design, robotics and automated manufacturing, safety and other areas. The aerospace engineering background also allows graduates to pursue careers in non-aerospace fields of engineering. Graduates of the aerospace engineering program will be prepared to apply the

following skills to problems of interest either in the industry or research and development:

- engineering sciences,
- mathematics,
- computational methods,
- modern experimental methods,
- effective communication skills and
- systems engineering principles.

The aerospace engineering program is also intended to prepare students to pursue graduate study, which can be of significant benefit in the aerospace profession. The general goals of the aerospace engineering program, as well as the program educational objectives, are the same as those stated above for the mechanical engineering program.

Requirements (122 Credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science, and engineering courses applied toward their B.S. in AE and/or ME minor.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2 ¹</i>		3
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences & Social/Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G	Calculus -Based Physics I	4
PHYS 1310L	and Calculus -Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences ¹</i>		3
<i>Areas V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing a Wider World		
<i>Viewing a Wider World Elective ³</i>		3
Select one Viewing A Wider World course from the following:		3
MATH 411V	Great Theorems in Mathematics	
PHYS 303V	Energy and Society in the New Millennium	
PHYS 305V	The Search for Water in the Solar System	
Departmental/College Requirements		
<i>Mechanical Engineering</i>		
ENGR 110	Introduction to Engineering Design	3
ENGR 233	Engineering Mechanics I	3

ENGR 234	Engineering Mechanics II	3
M E 210	Electronics and System Engineering	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
M E 228	Engineering Analysis I	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
M E 328	Engineering Analysis II	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1
<i>Aerospace Engineering</i> ⁴		
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3
A E 439	Aerodynamics II	3
A E 424	Aerospace Systems Engineering	3
A E 428	Aerospace Capstone Design	3
A E 447	Aerofluids Laboratory	3
One Aerospace engineering senior elective listed below		3
A E 405	Special Topics	
A E 451	Aircraft Design	
A E 464	Advanced Flight Dynamics and Controls	
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
M E 487	Mechatronics	
Non- Departmental Requirements		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
<i>Natural Science</i>		
PHYS 1320G	Calculus -Based Physics II	3
<i>Engineering</i>		
ENGR 190	Introduction to Engineering Mathematics	4
C E 301	Mechanics of Materials	3
CHME 361	Engineering Materials	3
Second Language: (not required)		
Electives to bring the total credits to 122		0
Total Credits		122

¹ See General Education (p. 220) section in this catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

³ See the Viewing a Wider World (p. 224) section in this catalog for a full list of courses.

⁴ Courses subject to once per year rotation.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

Freshman

Fall		Credits
MATH 1511G	Calculus and Analytic Geometry I ¹	4
ENGR 190	Introduction to Engineering Mathematics	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G	Composition I	4
Credits		16

Spring

MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G	Calculus -Based Physics I	4
& PHYS 1310L	and Calculus -Based Physics I Lab	
ENGR 110	Introduction to Engineering Design	3
English Composition - Level 2 ²		3
Area IV: Social/Behavioral Sciences ²		3
Credits		17

Sophomore

Fall

MATH 2530G	Calculus III	3
PHYS 1320G	Calculus -Based Physics II	3
ENGR 233	Engineering Mechanics I	3
M E 210	Electronics and System Engineering	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
Credits		16

Spring

M E 228	Engineering Analysis I	3
ENGR 234	Engineering Mechanics II	3
M E 261	Mechanical Engineering Problem Solving	3
M E 240	Thermodynamics	3
Oral Communications Elective ²		3
Credits		15

Junior

Fall

M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 364	Flight Dynamics and Controls	3
C E 301	Mechanics of Materials	3
M E 349	MAE Career Seminar	1
Credits		16

Spring

A E 424	Aerospace Systems Engineering	3
A E 439	Aerodynamics II	3
A E 363	Aerospace Structures	3
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
Credits		15

Senior

Fall

CHME 361	Engineering Materials	3
A E 419	Propulsion	3
A E 447	Aerofluids Laboratory	3
Area V: Humanities ²		3

Area VI: Creative and Fine Arts ²		3
Credits		15
Spring		
A E 428	Aerospace Capstone Design	3
Aerospace engineering senior elective		3
Viewing a Wider World ³		3
Viewing a Wider World ³		3
Credits		12
Total Credits		122

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See the General Education (p. 220) section in this catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section in this catalog for a full list of courses.

Mechanical Engineering - Bachelor of Science in Mechanical Engineering

The mechanical engineering program prepares students for a wide range of professional engineering careers in such areas as: research and development; design; facilities operation and maintenance; management; and production. Graduates of the program will be prepared to apply engineering sciences, mathematics, computational methods, modern experimental methods, and effective communication skills to problems of interest in industry as well as government or scholarly topics. Employment opportunities for graduates are extensive. These opportunities include: energy and utility; manufacturing; automotive; aerospace; defense and space; research and development; and many others. The emphasis in the curriculum is on engineering sciences (solid mechanics, thermal sciences, fluid mechanics and materials science); mathematics; engineering analysis; engineering design; general sciences; and communication balanced with general education topics and electives. Graduates of the program will also be prepared for graduate studies (subject to grade-point and standardized test qualifications). Students will be prepared to take the fundamentals of engineering examination (and are encouraged to do so) as a step towards professional registration.

Requirements (122 Credits)

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science and engineering courses applied toward their B.S in ME and/or AE minor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
State of New Mexico Common Core		
<i>Area I: Communications</i>		

<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2 ¹</i>		
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social Behavioral Sciences</i>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	11
PHYS 1310G & PHYS 1310L	Calculus-Based Physics I and Calculus-Based Physics I Lab	
<i>Area IV: Social/Behavioral Sciences Course (3 credits) ¹</i>		
<i>Area V: Humanities ¹</i>		3
<i>Area VI: Creative and Fine Arts ¹</i>		3
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing A Wider World		6
Viewing a Wider World course (differs from below and is not in the College of AS) ³		
Select one Viewing A Wider World course from the following:		
MATH 411V	Great Theorems in Mathematics	
PHYS 303V	Energy and Society in the New Millennium	
PHYS 305V	The Search for Water in the Solar System	
Departmental/College Requirements		
<i>Mechanical Engineering</i>		
ENGR 110	Introduction to Engineering Design	3
M E 210	Electronics and System Engineering	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
M E 228	Engineering Analysis I	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Mechanical Engineering Problem Solving	3
M E 326	Mechanical Design	3
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 340	Applied Thermodynamics	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Select one Mechanics Elective from the following:		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
Mechanical engineering senior electives (Approved M E 400 level and/or A E 400 level courses only)		6
Non-Departmental Requirements		
<i>Mathematics</i>		
MATH 2530G	Calculus III	3
<i>Natural Science</i>		
PHYS 1320G	Calculus-Based Physics II	3
<i>Engineering</i>		
ENGR 190	Introduction to Engineering Mathematics	4
C E 301	Mechanics of Materials	3

CHME 361	Engineering Materials	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives to bring the total credits to 122		0
Total Credits		122

¹ See the General Education (p. 220) section in the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

³ See Viewing a Wider World (p. 224) section in the catalog for a full list of courses.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		
Fall		Credits
MATH 1511G	Calculus and Analytic Geometry I ¹	4
ENGR 190	Introduction to Engineering Mathematics	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G	Composition I	4
Credits		16
Spring		
MATH 1521G	Calculus and Analytic Geometry II	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ENGR 110	Introduction to Engineering Design	3
Area I: Communications - English Composition - Level 2 Course ²		3
Area IV: Social/Behavioral Sciences Course ²		3
Credits		17
Sophomore		
Fall		
MATH 2530G	Calculus III	3
ENGR 233	Engineering Mechanics I	3
PHYS 1320G	Calculus -Based Physics II	3
M E 210	Electronics and System Engineering	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
Credits		16
Spring		
M E 228	Engineering Analysis I	3
ENGR 234	Engineering Mechanics II	3
M E 261	Mechanical Engineering Problem Solving	3
M E 240	Thermodynamics	3
Area I: Communications - Oral Communications Course ²		3
Credits		15

Junior		
Fall		
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
C E 301	Mechanics of Materials	3
M E 340	Applied Thermodynamics	3
CHME 361	Engineering Materials	3
M E 349	MAE Career Seminar	1
Credits		16
Spring		
M E 326	Mechanical Design	3
Choose one Mechanics Elective from the following:		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
Area V: Humanities Course ²		3
Credits		15
Senior		
Fall		
ENGR 401	Engineering Capstone I	3
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Area VI: Creative and Fine Arts Course ²		3
Viewing a Wider World Course ³		3
Credits		15
Spring		
ENGR 402	Engineering Capstone II	3
Mechanical engineering senior electives		6
Viewing a Wider World Course ³		3
Credits		12
Total Credits		122

¹ MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

² See General Education (p. 220) section in the catalog for a full list of courses.

³ See Viewing a Wider World (p. 224) section in the catalog for a full list of courses.

Aerospace Engineering - Undergraduate Minor

Prefix	Title	Credits
Requirements		
<i>Math and Science</i>		
MATH 1511G	Calculus and Analytic Geometry I	4
MATH 1521G	Calculus and Analytic Geometry II	4
MATH 2530G	Calculus III	3
PHYS 1310G	Calculus -Based Physics I	3
<i>Required Engineering</i>		
C E 301	Mechanics of Materials	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3

M E 240	Thermodynamics	3
M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
Technical Electives ¹		
Select one from the following:		3
A E 364	Flight Dynamics and Controls	
A E 439	Aerodynamics II	
Select one from the following:		3
A E 362	Orbital Mechanics	
A E 363	Aerospace Structures	
A E 419	Propulsion	
Total Credits		38

¹ Technical Electives cannot be used to satisfy BSME Engineering elective requirement.

Mechanical Engineering - Undergraduate Minor

Prefix	Title	Credits
Requirements		
<i>Math and Science</i>		
MATH 1511G	Calculus and Analytic Geometry I	4
MATH 1521G	Calculus and Analytic Geometry II	4
MATH 2530G	Calculus III	3
PHYS 1310G	Calculus -Based Physics I	3
<i>Required Engineering</i>		
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 425	Design of Machine Elements	3
<i>Technical Elective ¹</i>		
Select one from the following:		3
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
M E 481	Alternative and Renewable Energy	
M E 487	Mechatronics	
Total Credits		38

¹ Technical Elective cannot be used to satisfy BSAE Engineering elective requirement.

College of Health, Education and Social Transformation

Dean - Yoshitaka Iwasaki

Interim Associate Dean for Academic Affairs - Phillip Post

Interim Associate Dean for Research - Jill McDonald

Interim Associate Dean for Research - Anita Hernandez

Co-Director of Research Operations and Fiscal & Data Management. - Juanita Hannan

Co-Director of Research Operations and Fiscal & Data Management - Aida Lopez

Coordinator, Educational Support and Resource Center- Margo Trevino-Torres

Student Program Coordinator - Melanie Smoak

Communication Specialist - Amanda Adame

The College of Health, Education, and Social Transformation (HEST) was established in 2021 to serve students, faculty, and staff whose efforts aim to improve individual, societal, and policy outcomes. The college was formed by combining the previous College of Education and College of Health and Social Services, as well as the Department of Sociology from the College of Arts & Sciences. In the Spring of 2023, the college added the Borderlands and Ethnic Studies Department. We offer stackable credentials, certificates, minors, and degrees in the following areas: borderlands and ethnic studies; communication disorders; counseling and educational psychology; kinesiology; nursing; public health; social work; sociology; and teacher preparation, administration, and leadership (TPAL).

General Undergraduate Requirements

1. Complete at least 120 - 132 acceptable credits, including a minimum of 48 credits in courses numbered 300 or above. NMSU Viewing the Wider World (VWW) classes are included in the 48-credit hour requirement.
2. The minimum GPA varies per degree program. Please refer to your department/school for application, admission, and/or program GPA requirements. Each department has information about minimum GPA, program prerequisites, and program-specific testing requirements. Application to a HEST program does not automatically end in acceptance.
3. Satisfy New Mexico general education requirements. The HEST Undergraduate Resource Center and the Center for Academic Advising and Support Services (CAASS) have detailed degree maps, program information, and curricula.
4. All students, including transfer students, must complete the last 30 semester credits required for the baccalaureate degree within the New Mexico State University system. Students in the four-year Servicemen's Opportunity College Program are not exempt from this regulation.
5. Students interested in teacher preparation (including secondary education minors), nursing, social work, and public health programs must apply and be accepted into these programs based on a set of prerequisites and a competitive admission process. For information about these application and admission processes, please refer to each department's information in this catalog.
6. In addition, if department faculty determine that a student is performing below expected program standards in a particular skill, that department may require that a remediation plan be developed to promote student success.

General Education Requirements (non-teacher education programs)

1. Ten credits in General Education Area I: Communication
2. Three to four credits in General Education Area II: Mathematics
3. Ten to eleven credits in General Education Area III/IV: Laboratory Science and Social/Behavioral Sciences
4. Three credits in General Education Area V: Humanities
5. Three credits in General Education Area VI: Creative and Fine Arts
6. Three to four additional credits from a General Education Elective

General Education Requirements (teacher education programs)

1. Ten credits in General Education Area I: Communication
2. Three credits in General Education Area II: Mathematics
3. Eleven credits in General Education Area III/IV: Laboratory Science and Social/Behavioral Sciences
4. Three credits in General Education Area V: Humanities
5. Three credits in General Education Area VI: Creative and Fine Arts
6. Three additional credits from a General Education Elective

HEST programs may require more credit hours or additional courses specific to the major. Check the departmental pages for degree requirements in each program of study.

While the ultimate responsibility for planning an academic program in compliance with university, college, and departmental requirements rests with the student, the College recognizes the importance of sound and accessible advising for academic programs. Students formally admitted to a HEST major are provided academic advising within the department of that major. Students not formally admitted to a program of professional studies are advised by CAASS.

Transferring Undergraduate Courses

Certain courses within the curricula offered by HEST programs have been identified as transferable from NMSU to other public two-year and four-year institutions in New Mexico. The equivalent course at other institutions can be identified using the common course number. Similarly, students from other institutions can use the common course number to identify education courses that can be transferred to NMSU.

The School of Nursing offers the New Mexico Nursing Education Consortium (NMNEC) state-wide.

Preprofessional Programs

NMSU offers several programs for students to transfer into professional schools throughout the university. The programs administered by the HEST are Pre-Nursing, Pre-Social Work, Pre-Public Health Sciences. Students new to NMSU or working on completing their departmental prerequisites can declare a pre-professional major in HEST. Once prerequisites have been satisfied, an application process is required specific to each major. Application details and requirements are available

through the "Academic Departments" link on the HEST website (<http://health.nmsu.edu>) and the Central Advising Center (CAASS).

Graduate Work

HEST offers curricula leading to the degrees of:

- Master of Arts,
- Master of Science,
- Specialist in Education,
- Doctor of Education
- Doctorate of Nursing Practice,
- Doctor of Philosophy.

Those interested in pursuing graduate degrees should consult the Graduate Catalog for full information at <https://catalogs.nmsu.edu/nmsu/graduate-school/>.

Bachelor Degrees

C

- Communication Disorders - Bachelor of Science in Communication Disorders (p. 1122)
- Communication Disorders - Bachelor of Science in Communication Disorders (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-disorders-bscd-online/>)
- Counseling and Community Psychology - Bachelor of Science (p. 1113)
- Counseling and Community Psychology - Bachelor of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/counseling-community-psychology-bs-online/>)

D

- Dance (Contemporary Dance) - Bachelor of Arts in Dance (p. 1148)

K

- Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology (p. 1151)
- Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology (p. 1153)
- Kinesiology (Physical Education) - Bachelor of Science in Kinesiology (p. 1155)

N

- Nursing - Bachelor of Science in Nursing (p. 1191)

P

- Public Health - Bachelor of Public Health (p. 1201)
- Public Health - Bachelor of Public Health (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-bph-online/>)

S

- Social Work - Bachelor of Social Work (p. 1308)
- Social Work - Bachelor of Social Work (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/social-work-bsw-online/>)
- Sociology - Bachelor of Arts (p. 1317)
- Sociology - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/sociology-ba-online/>)

- Special Education (Secondary Education) - Bachelor of Science in Education (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/special-education-secondary-education-bsed-online/>)

Masters Degrees

A

- Athletic Training - Master of Science (p. 95)

C

- Clinical Mental Health Counseling - Master of Arts (p. 121)
- Communication Disorders - Master of Arts (p. 122)
- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 125)

E

- Education (Bilingual Education) - Master of Arts (p. 129)
- Education (Curriculum & Instruction) - Master of Arts (p. 130)
- Education (Curriculum & Instruction) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-curriculum-instruction-ma-online/>)
- Education (Early Childhood Education Plus Licensure) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-early-childhood-ed-plus-licensure-ma-online/>)
- Education (Early Childhood Education Plus Licensure) - Masters of Arts (p. 131)
- Education (Early Childhood Education) - Master of Arts (p. 130)
- Education (Early Childhood Education) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-early-childhood-ed-ma-online/>)
- Education (Educational Learning Technologies) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-educational-learning-technologies-ma-online/>)
- Education (Elementary Licensure Prep) - Master of Arts (p. 131)
- Education (Elementary Licensure Prep) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-elementary-licensure-prep-ma-online/>)
- Education (Elementary Mathematics and Science) - Master of Arts (p. 132)
- Education (Language, Literacy & Culture) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-language-literacy-culture-ma-online/>)
- Education (Language, Literacy, & Culture) - Master of Arts (p. 133)
- Education (Secondary Licensure Prep) - Master of Arts (p. 133)
- Education (Secondary Licensure Prep) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-secondary-licensure-prep-ma-online/>)
- Education (Spanish) - Master of Arts in Teaching (p. 135)
- Education (Teaching English to Speakers of Other Languages) - Master of Arts (p. 135)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (p. 136)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (p. 136)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/educational-leadership-administration-higher-ed-admin-ma-online/>)

F

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 145)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 144)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 145)
- Family and Consumer Sciences (Human Nutrition & Dietetic Sciences) - Master of Science (p. 147)

M

- Master of Public Health/Master of Social Work - Dual Degree (<http://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/>)

P

- Public Health (Health Behavior and Health Promotion) - Master of Public Health (p. 159)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (p. 161)

S

- Social Work - Master of Social Work (p. 163)
- Sociology - Master of Arts (p. 164)
- Special Education - Master of Arts (p. 167)
- Special Education - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/special-education-ma-online/>)

Specialist Degree

- School Psychology - Specialist in Education (p. 204)

Doctoral Degrees

C

- Counseling Psychology - Doctor of Philosophy (p. 181)
- Curriculum and Instruction - Doctor of Philosophy (p. 182)
- Curriculum and Instruction - Doctor of Philosophy (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/curriculum-instruction-phd-online/>)

E

- Educational Leadership & Administration (Higher Education Administration) - Doctor of Education (p. 184)
- Educational Leadership & Administration (Higher Education) - Doctor of Philosophy (p. 185)
- Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education (p. 186)

- Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy (p. 186)

H

- Health Equity Sciences - Doctor of Philosophy (p. 193)

K

- Kinesiology - Doctor of Philosophy (p. 194)

N

- Nursing Practice (Family Nurse Practitioner) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-family-nurse-practitioner-dnp-online/>)
- Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice (p. 196)
- Nursing Practice (Population Health Leadership) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-population-health-leadership-dnp-online/>)
- Nursing Practice (Psychiatric/Mental Health) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-psychiatric-mental-health-dnp-online/>)
- Nursing Practice - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-dnp-online/>)

S

- School Psychology - Doctor of Philosophy (p. 200)

Graduate Certificates

- Autism and Spectrum Disorders - Graduate Certificate (p. 204)
- Autism and Spectrum Disorders - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/autism-spectrum-disorders-gr-certificate-online/>)
- Bilingual Education - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/bilingual-education-gr-certificate-online/>)
- Early Childhood Alternative Licensure - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/early-childhood-alt-licensure-gr-cert-online/>)
- Elementary Education Alternative Licensure - Graduate Certificate (p. 207)
- Family Nurse Practitioner - Post-Masters Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/family-nurse-practitioner-pm-certificate-online/>)
- Health Equity Sciences - Doctor of Philosophy (p. 193)
- Online Teaching and Learning - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/online-teaching-learning-gr-certificate-online/>)
- Principal Licensure - Graduate Certificate (p. 208)
- Psychiatric/Mental Health Nurse Practitioner - Post-Masters Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/psychiatric-mental-health-nurse-practitioner-pmc-online/>)
- Public Health - Graduate Certificate (p. 208)
- Public Health - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-gr-certificate-online/>)

- Secondary Education Alternative Licensure - Graduate Certificate (p. 209)
- Special Education Alternative Licensure - Graduate Certificate (p. 210)
- Teaching English to Speakers of Other Languages - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/tesol-gr-certificate-online/>)

Undergraduate Minors

- Counseling and Education Psychology - Undergraduate Minor (p. 1115)
- Dance - Undergraduate Minor (p. 1157)
- Exercise Science - Undergraduate Minor (p. 1158)
- Gerontology - Undergraduate Minor (p. 1203)
- Pre-Health - Undergraduate Minor (p. 1079)
- Public Health - Undergraduate Minor (p. 1203)
- Sociology - Undergraduate Minor (p. 1319)
- U.S.-Mexico Border Health Issues - Undergraduate Minor (p. 1203)

Graduate Minors

- Educational Administration (Doctoral) - Graduate Minor (p. 213)
- Educational Administration (Higher Ed.) - Graduate Minor (p. 213)
- Educational Administration (Pk-12) - Graduate Minor (p. 213)
- Gerontology - Graduate Minor (p. 215)
- Integrated Behavioral Health Care - Graduate Minor (p. 216)
- Sociology - Graduate Minor (p. 218)
- Spanish Counseling - Graduate Minor (p. 218)
- Special Education - Graduate Minor (p. 220)
- U.S.-Mexico Border Health Issues - Graduate Minor (p. 220)

Accreditation

The programs offered by HEST provide undergraduate students with a broad general education with an emphasis on professional preparation in various disciplines. These programs are nationally accredited, while some require approval by the State of New Mexico. These programs include:

Teacher Preparation: The university's teacher preparation program, which involves several colleges and is directed by the College Health, Education, and Social Transformation, was re-accredited in 2018 by the Council for the Accreditation of Education Preparation Programs (CAEP). The undergraduate and graduate programs that prepare individuals for licensure to work in public and private schools in New Mexico have been approved by the New Mexico State Public Education Department.

Counseling and Educational Psychology: The Master of Arts (MA) in Clinical Mental Health Counseling, accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP); the Specialist in Education (Ed.S.) in school psychology, accredited by the National Association of School Psychologists (NASP) and the doctoral (Ph.D.) program in counseling psychology accredited by the American Psychological Association (APA). The post-doctoral program in Clinical Psychopharmacology holds APA designation.

Health and Social Services: The baccalaureate degree program in the School of Nursing is accredited by the Commission of Collegiate Nursing Education (CCNE). The New Mexico Board approves the undergraduate program in Nursing of Nursing.

The baccalaureate degree program in the School of Social Work is accredited by the Council on Social Work Education (CSWE). The Bachelor of Public Health and Masters of Public Health degree programs in the Department of Public Health Sciences is accredited by the Council on Education for Public Health (CEPH).

The **Communication Disorders** master's program in Speech-Language Pathology is accredited by the American Speech-Language-Hearing Association (CAA - ASHA).

The **Athletic Training Degree** in the Department of Kinesiology is accredited by the Commission on Accreditation of Athletic Training (CAATE).

Pre-Health - Undergraduate Minor

The Pre-Health minor is designed to be useful for undergraduate students interested in attending health-related professional schools (i.e., medical, dental, physical therapy, etc.). The courses selected for the minor represents content that will help prepare students to apply and attended health-related professional schools.

Requirements

A minor in Pre-Health must include 22 credits from the listed courses work below.

Prefix	Title	Credits
Core Courses ¹		
BCHE 395	Biochemistry I	3
BIOL 354	Physiology of Humans	3
or SPMD 3210	Anatomy and Physiology II	
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
<i>Choose one of the following:</i>		4
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ²	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Biology, Genetics, Anthropology, Kinesiology and Public Health area courses		
<i>Choose one of the following:</i>		3-4
BIOL 311	General Microbiology	
BIOL 377	Cell Biology	
BIOL 385	An Introduction to Cancer	
BIOL 474	Immunology	
BCHE 396	Biochemistry II, Lecture and Laboratory	
GENE 320	Hereditary and Population Genetics	
GENE 315	Molecular Genetics	
TOX 361	Basic Toxicology	
SPMD 3050	Therapeutic Modalities	
SPMD 4450	Pathophysiology and Human Function(s)	
SPMD 4510	Neurophysiology and Human Function	
PHLS 4610	Health Disparities: Determinants and Interventions	
ANTH 355	Biological Anthropology	

ANTH 402	Contemporary Medical Anthropology	
ANTH 435	Human Health and Biological Variation	
Statistics and Math area courses		
<i>Choose one of the following:</i>		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
Experiential Learning area courses		
<i>Choose one of the following:</i>		3
CHEM 441	Advanced Research	
BCHE 441	Advanced Research in Biochemistry	
HNRS 413	Medical Shadowing	
HNRS 400	Honors Capstone	
SPMD 4610	Research Seminar	
SPMD 4997	Problems	
PHLS 4515	Problems in Health Education	
PHLS 4998	Community Health Education Field Experience	
ANTH 486	Community Engagement and Service Learning	
Total Credits		22-23

¹ Any prerequisites for courses on the list must be satisfied before taking listed courses.

² PHYS 2230G General Physics for Life Science I/PHYS 2230L Laboratory to General Physics for Life Science I should be taken in the fall semester before taking PHYS 2240G General Physics for Life Science II/PHYS 2240L Laboratory to General Physics for Life Science II in the following spring semester.

Recommendations for VWW courses (not required):

- PHLS 3130V Global Environmental Health Issues
- PHLS 4620V Cross-Cultural Aspects of Health
- ANTH 357V Medical Anthropology
- GNDR 381V Women's Health Issues/PHLS 3120V Women's Health Issues (cross-listed class)
- GNDR 433V Sex, Gender and Culture
- ECON 432V Economics of Health Care
- SOCI 3120V Introduction to Population Studies
- SOCI 3245V Comparative Family Systems

Borderlands and Ethnic Studies

The Borderlands and Ethnic Studies Department offers courses in the following areas: Borderlands and Ethnic Studies (BEST), Chicana/o Studies (CCST), Native American Studies (NATV), Palestine Studies, and Decolonial Methodologies.

Program Information

The Borderlands and Ethnic Studies Department offers an **Undergraduate Minor in Borderlands and Ethnic Studies**, an **Undergraduate Minor in Chicana/o Studies**, an **Undergraduate Minor in Native American**

Studies, a Graduate Minor in Native American Studies, and a Graduate Certificate in Borderlands and Ethnic Studies.

The interdisciplinary faculty in BEST outline and analyze the history, cultural production, politics, and consequences of racialization and identity formation from a diasporic and transnational/transborder approach that remains rooted in a place-based, Borderlands imperative.

Degrees for the Department

- Borderlands and Ethnic Studies - Graduate Certificate (p. 204)

Minor for the Department

- Undergraduate Minor(s) (<http://catalogs.nmsu.edu/label::/nmsu/health-education-social-transformation/borderlands-ethnic-studies/119/>)
- Borderland and Ethnic Studies - Undergraduate Minor (p. 1087)
- Chicana/o Studies - Undergraduate Minor (p. 1087)
- Native American Studies - Undergraduate Minor (p. 1088)
- Native American Studies - Graduate Minor (p. 217)

Professor, Dulcinea Lara, Department Head

Professors Hamzeh, Lara; **Associate Professor** Garay; **Assistant Professor** Badoni.

G. Badoni, Ph.D. (U of Arizona)– Native American Studies, Native American visual culture, Native American education; R. J. Garay, Ph.D. (Arizona State)– Latina/o/e/x and African American Literatures; M. Hamzeh, Ph.D. (New Mexico State)– Decolonial methodologies, Palestine Studies; D. Lara, Department Head, Ph.D. (Berkeley)– Relational Ethnic Studies, Chicana/o Studies, Chicana/o History

Borderlands and Ethnic Studies

BEST 1110G. Introduction to Borderlands and Ethnic Studies

3 Credits (3)

The field of Ethnic Studies is about 1) critical knowing and 2) unapologetic imagining and creation of a better, more just world. This course explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. The past few decades have borne witness to increasing global diversity and cross-border migrations, which has led many in the U.S. to imagine the nation as “post-racial.” Simultaneously, increasing clashes that can only be described as “racist” have led people to wonder about the dark racist underpinnings of a society that believes it has achieved the goals put forth by the distinct and intersecting Civil Rights Movements of the 1960s. Perhaps now, more than any other time in history, there is earnest desire to talk about race and racism and unpack these constructs/activities/outcomes. This course is designed to inform us about how colonization, racism, and hegemony function. Secondly, it is designed for self and collective exploration of these somewhat broad and abstract concepts in an applied manner. Finally, it is designed for us to arrive at a shared understanding of the decolonial turn, or a re-humanization imperative. How do we understand, apply, and heal as these activities each relate to coloniality of power

Learning Outcomes

1. Learn and understand broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies “canon.”
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in “everyday life” via course activities
5. Gain a better understanding of your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance
6. Learn mindful and constructive ways to engage peers about sometimes “difficult” topics like race, power, and privilege.

BEST 300. History and Theories in Borderlands and Ethnic Studies 3 Credits (3)

This course provides a basic understanding of the history and theoretical foundations of Borderlands and Ethnic Studies. It engages in an in-depth analysis of the concepts and history that resulted in reshaping the way we understand race, national borders, immigration, education, and the law. It examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. It explores the history of social movements in the U.S. that sought to illuminate social inequalities and social justice issues and investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. Throughout the course we will ask the following questions: How does the idea of race permeate our everyday lives? How does education reinforce our understandings of race? How do historical struggles over economic resources and political power illuminate the formation and development of the borderlands? How does law relate to power relations and mechanisms of social control?

Learning Outcomes

1. Explain how race and ethnicity has been historically socially constructed in the U.S.
2. Understand how the social construction of race and ethnicity is related to issues of social control.
3. Understand how the idea of race helps to reinforce existing power arrangement.
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the Borderlands.
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Understand how race relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression
9. Gain a better understanding of your own worldviews and opinions towards issues of race, class, , gender, nationalism, migration, borders, social movements, and resistance 1
10. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race

BEST 400. Capstone in Borderlands and Ethnic Studies 3 Credits (3)

This seminar is designed to culminate the undergraduate minor by summarizing knowledge and experience garnered in pre-courses: Intro to Borderlands & Ethnic Studies, History & Theories of Ethnic Studies, as well as the chosen gender course, the chosen race, history & education course, and the chosen elective course. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback.

Prerequisite/Corequisite: BEST 1110G, BEST 300, and either (AFST 2140G, CCST 3120V, or NATV 4110) and either (AFST 4110, CCST 3110, or NATV 4210).

Learning Outcomes

1. Design and develop a semester-long project that draws upon all previous BEST in collaboration with instruction and peers.
2. Re-explain vis-a-vis previous courses how race and ethnicity has been historically socially constructed in the U.S.
3. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race.
4. Work with a community organization, agency, or other group to collaborate on the final project.
5. Present project to class as a final product.

BEST 450. Special Topics in Borderlands and Ethnic Studies 3 Credits (3)

This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles. May be repeated up to 9 credits.

Learning Outcomes

1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicana Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 510. Foundations in Borderlands & Ethnic Studies**3 Credits (3)**

This seminar explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. In addition to race, other social locations such as gender, class, and sexual orientation are explored as intersectional. The course uses traditional lecture format, multi-media, guest lecturers, and engaging activities inside and outside the classroom to apply materials in tangible and impactful ways. May be repeated up to 6 credits.

Learning Outcomes

1. Identify, compare and contrast broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies “canon.”
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in “everyday life” via course activities.
5. Demonstrate mindful and constructive ways to engage peers about sometimes “difficult” topics like race, power, and privilege.

BEST 511. Methodologies in Borderlands and Ethnic Studies**3 Credits (3)**

This seminar introduces the practice of indigenizing research methods by looking beyond the canon of Eurocentric methodologies that have often trapped marginalized communities outside of normative time frames. Through the deconstruction of colonial apparatuses and their influence on research methods, the class explores key concepts in decolonizing research to move us to new understandings of communities according to indigenous traditions that privilege ancestral ways of knowing. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

BEST 512. Theories in Borderlands and Ethnic Studies**3 Credits (3)**

This seminar provides a basic understanding of theoretical foundations of Borderlands and Ethnic Studies. It also examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. Social movements in the U.S. that sought to illuminate social inequalities and social justice issues are explored. The course investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how race and ethnicity has been socially constructed in the U.S.
2. Recognize how the social construction of race and ethnicity is related to issues of social control
3. Describe how the idea of race helps to reinforce existing power arrangements
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the borderlands
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Distinguish how biopolitics relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain an understanding of and be able to evaluate your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance.
10. Critically engage and “think outside the box” when discussing the conceptualization and development of the idea of race.

BEST 513. Capstone in Borderlands and Ethnic Studies**3 Credits (3)**

This seminar is designed to culminate the graduate certificate by summarizing knowledge and experience garnered in pre-courses: BEST 510, 511, 512. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback.

Prerequisite(s): BEST 510; BEST 511; BEST 512.

Learning Outcomes

1. Summarize, concisely, key concepts and frameworks learned in BEST seminars.
2. Express, reflectively, what these concepts and frameworks mean in the context of historical and contemporary social issues related to power dynamics created and exacerbated by hierarchies associated with racial, gender, class, sexual orientation and other positionalities.
3. Design a culminating project that encapsulates a nuanced understanding of Borderlands and Ethnic Studies, ensuring its impact on a broader audience.
4. Generously evaluate cohort mates' projects as they progress during semester.
5. Receive feedback about one's own project and apply those comments and critiques in useful ways and in collaboration with instructor.
6. Create/generate a culminating project that aligns with rubrics in the most effective manner possible.
7. Present work to cohort and instructor in an effective way.

BEST 550. Advanced Special Topics in Borderlands and Ethnic Studies**3 Credits (3)**

This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles. May be repeated up to 9 credits.

Learning Outcomes

1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicana Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

Chicana and Chicano Studies**CCST 2110G. Introduction to Chicana and Chicano Studies****3 Credits (3)**

An introductory survey of the Mexican American experience in the United States, with special reference to New Mexico. The course includes exploration of historical, political, social and cultural dimensions. NMSU Specific It seeks to review the historical causes and consequences of the formation of the Chicano identity and to understand its relation to the development of the Chicano experience as a distinct culture. The course explores the social and political impact that Chicana/o thought and theory has had on the United States over time, specifically developing concepts related to identity, community, social movements, and social justice. Ultimately, the course will facilitate understanding the historical ways in which Chicana/os have negotiated the pressures of their surroundings and in the process shaped or redefined American conceptions of identity, race, gender, sexuality, ethnicity, education, protest, and resistance.

Learning Outcomes

1. Apply various transdisciplinary perspectives and processes to understand humanist expressions through a variety of creative productions.
2. Assess and apply social, historical, economic and cultural perspectives as they impact diverse populations over a period of time.
3. Explain the ways in which narratives help people understand one another more clearly and profoundly across ethnic and cultural groups.
4. Design projects that foster and increase a full understanding of a subject in order to promote change in their own and listeners' attitudes, values, beliefs, or behaviors.
5. Apply qualitative and numerical data to explain diverse human actions in an everyday context of life.

CCST 3110. Chicana/o History**3 Credits (3)**

This course is an exploration and discuss the history of Mexican Americans in the U.S., with emphasis on their contributions to society and the political, economic and cultural forces that exemplify their experiences as a population. Beginning in 1492, at the onset of European “contact” with indigenous people living in what is now called Mexico, students will study the early beginnings of Mexicans as a mestizo (mixed) race and follow this group on a rough timeline through the present. Films, music, images and poetry are included to supplement lecture material. With special attention to New Mexico and the borderlands specifically, students will endeavor to make relevant, contemporary connections to the material. Additionally, the course will contextualize this history of a population and experiences within the establishment of Chicana/o Studies as an evolving discipline.

Learning Outcomes

1. Summarize the major economic, political, social and cultural histories defining and effected by the Mexican American population.
2. Gain understanding of how these histories evolved in political solidarity with other minority populations in the United States.
3. Understand the multidisciplinary diversity and intellectual rigor that effected and currently compose Chicana/o Studies as an academic discipline.
4. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
5. Interpret, understand, and engage texts within cultural, social and historical contexts.
6. Gather, analyze, and evaluate information from a variety of sources.
7. Compose texts in a variety of media formats.

CCST 3120V. Chicana/o Genders and Sexualities**3 Credits (3)**

This survey course introduces students to Chicanx genders and sexual identities and representations as socially and culturally constructed in transnational Latinx communities and contexts. Through a lens of Chicana feminist and queer theories, students will gain familiarity with gender- and sexuality-related stereotypes and cultural expectations, as well as the histories of individual and group resistance to these norms. Course materials will highlight the revolutionary challenges to limitations and contributions to social, political, and cultural change made by queer Chicanx individuals and groups, women, and men resisting confining constructions of masculinity. This course will be both reading and writing intensive.

Learning Outcomes

1. Explain the multidisciplinary diversity and intellectual rigor that compose Chicanx feminist and queer theoretical traditions
2. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions
3. Interpret, understand, and engage texts within cultural, social and historical contexts
4. Gather, analyze, and evaluate information from a variety of sources
5. Compose texts in a variety of media formats.

CCST 3130. Chicana/o Education**3 Credits (3)**

This course deconstructs the history of education through the lens of culture and race. Using a framework of intersectionality, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/ multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today. Additionally, this course will particularly foreground Latinx and Chicanx resistance and revolution in the realm of education and what this history and activism teaches us about our own identity, worldviews, environment, and ways of understanding in the contexts of both informal and formal processes and experiences of education.

Learning Outcomes

1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall, especially for Latinx and Chicanx students.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

Native American Studies

NATV 1150G. Introduction to Native American Studies**3 Credits**

This course surveys the significance of Native American Studies through an inter-disciplinary approach to two areas of academic concentration: Indigenous Learning Communities, and Leadership and Building Native Nations.

Learning Outcomes

1. Students will develop a general understanding of the various concentration areas in Native American Studies throughout the United States.
2. Students will identify the contributions of various academic disciplines to Native American Studies.
3. Students will understand the intricacies and intersections of Indigenous scholarship in Native American Studies.
4. Students will articulate the importance of Native American Studies as a stand-alone discipline in academia.
5. Students will be able to connect community issues in both Native and Non-Native America to concepts taught in Native American Studies.

NATV 2120. Native American Experience**3 Credits (3)**

Introductory survey of Native American History, culture and contemporary issues. Students read literature by and about Native Americans covering a variety of topics including tribal sovereignty, federal policy, activism, economic development, education and community life.

Learning Outcomes

1. Apply cultural and historical context to text about Native Americans (by Natives and non-Natives).
2. Analyze texts about Native Americans in relation to tribal sovereignty, federal policy, activism, economic development, education and community life.
3. Evaluate texts by and about Native Americans from an NAS perspective.

NATV 3120. An Indigenous Peoples History of the United States**3 Credits (3)**

This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.

Learning Outcomes

1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States.
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student is able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 4110. Native American Women**3 Credits (3)**

Students investigate the status, experience, and contributions of Native American women from pre-contact to contemporary times. Identifying the contribution of Native American women to societies, communities, and Nations as keepers of knowledge, teachings, and traditions. Crosslisted with: ANTH 553.

Learning Outcomes

1. Explore and examine the roles of American Indian women within a tribal society and analyze the impact of colonization and decolonization upon their place / roles over time.
2. Evaluate historical and contemporary issues of importance to American Indian women and their communities.
3. Assess a topic, book or issue of importance to Native women through a research paper, case study, or exam demonstrating in-depth knowledge and understanding.
4. Demonstrate in-depth knowledge and understanding of Native American women histories and contemporary issues.
5. Formulate a paper on Native woman/tribal women from historical or contemporary sources and share with class (undergraduates).
6. Demonstrate in-depth knowledge and understanding of Native American women through an exam/final (undergraduates).

NATV 4120V. Native American Visual Culture**3 Credits (3)**

This course examines the various theoretical and methodological challenges inherent to the study of indigenous art, including the issues of identity, sovereignty, gender, cultural critique, and the role of the artist.

Learning Outcomes

1. Identify NA / Indigenous, film/video writers and directors.
2. Locate NA / Indigenous nations with their geo-physical location.
3. Consider issues of identity concerning Indigenous population.
4. Apply "colonizing" / "decolonizing" methodologies.
5. To practice writing short analytical journal entries.
6. To learn effective group discussion techniques

NATV 4130. Indigenous Ways of Knowing**3 Credits (3)**

This course examines Indigenous knowledge and ways of knowing to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. The course explores and analyzes the nature and ways that Native Americans' develop knowledge as well as the concepts and composition of metaphysics and cosmology. Students analyze knowledge development through mythology and storytelling by emphasizing the nature of difference rather than comparative analysis.

Learning Outcomes

1. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain characters and ways that Native Americans' develop knowledge (epistemology); as measured by reports, critiques, reflective summaries, learning logs, analysis techniques and assessments.
2. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain concepts and composition of the metaphysics and cosmology (ontology) of Native American knowledge; as measured by reports, critiques, reflective summaries, learning logs, analysis techniques, and assessments.

NATV 4210. Native American Education**3 Credits (3)**

This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.

Learning Outcomes

1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written paper about an American Indian boarding school and its legacy.

NATV 4220. Federal Indian Policy**3 Credits (3)**

This course provides a basic historic overview of federal Indian policy. As preexisting sovereign nations, the U. S. Constitution acknowledges only states, foreign nations, and Indian tribes as sovereign governments. The purpose is to provide a fundamental understanding of the unique position Indian tribes occupy in this country. It examines impacts and effects on culture and contemporary livelihood.

Learning Outcomes

1. The student can recall and identify fundamental laws, policies, and court actions affecting Indian tribes.
2. The student can describe and explain the effects of federal Indian policy on activities and interactions between Native American and the overall society.
3. The student can analyze and interpret the impacts and effects of federal Indian policy on culture and contemporary lives of Native Americans

NATV 4310. Indigenizing Methodologies in Native American Studies**3 Credits (3)**

This course utilizes decolonizing (indigenizing) methodologies and praxis to gain insight into the complex effects of oppression and colonization. The course uses critical and indigenous concepts to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Emphasis includes research theory and methodology, such as community participatory action research, that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people. Crosslisted with: ANTH 541.

Learning Outcomes

1. The student is able to describe and explain some of the complex effects of oppression and colonization on indigenous peoples.
2. The student is able to identify historic and contemporary issues that have influenced and affected the study and research of indigenous peoples.
3. The student is able to convey particular research theory and methodology that is collaborative, inclusive, and pragmatic to ethics and cultural boundaries of indigenous people.

NATV 5120. Advanced Indigenous Peoples History of the United States**3 Credits (3)**

This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.

Learning Outcomes

1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student is able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 5210. Advanced Native American Education**3 Credits (3)**

This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.

Learning Outcomes

1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written paper about an American Indian boarding school and its legacy.

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Borderland and Ethnic Studies - Undergraduate Minor

Prefix	Title	Credits
BEST 1110G	Introduction to Borderlands and Ethnic Studies	3
BEST 300	History and Theories in Borderlands and Ethnic Studies	3
BEST 400	Capstone in Borderlands and Ethnic Studies	3
Choose one from the following:		3
AFST 2140G	Black Women in the African Diaspora	
CCST 3120V	Chicana/o Genders and Sexualities	
NATV 4110	Native American Women	
Choose one from the following:		3
NATV 4210	Native American Education	
CCST 3130	Chicana/o Education	
AFST 4110	Race, Culture, and Education	
Elective Course		
Choose one from the following:		3
AFST 2110G	African American History	
CCST 3130	Chicana/o Education	
CJUS 414/514	Race, Crime and Justice	
CJUS 428/528	Mexican-Americans and Issues of Social Justice	
CJUS 429/529	Immigration & Justice	
ENGL 339V	Chicana/o Literature	
ENGL 458/558	Latino/a Literature and Culture	
ENGL 489/589	Cultural Studies: Literature and Theory	
ENGL 417/517	Advanced Study in Critical Theory	
HNRS 336V	Testimonios from the Borderlands	
NATV 1150G	Introduction to Native American Studies	
NATV 2120	Native American Experience	
NATV 4120V	Native American Visual Culture	
POLS 378	U.S.-Mexico Border Politics	
SOCI 3410/5410	Race and Ethnic Relations	
SPAN 385	Introduction to Chicano/US-Mexican Literature	
SPAN 421/521	New Mexico Culture and Literature	
SPAN 427/567	Chicano Literature	
SPAN 448/548	U.S.-Hispanic Film	
SPAN 451/551	Hispanic Cultures	
Total Credits		18

First Year

Semester 1		Credits
BEST 1110G	Introduction to Borderlands and Ethnic Studies	3
Credits		3

Semester 2

BEST 300	History and Theories in Borderlands and Ethnic Studies	3
Credits		3

Second Year

Semester 1

Choose one from the following:		3
AFST 2140G	Black Women in the African Diaspora	
CCST 3120V	Chicana/o Genders and Sexualities	
NATV 4110	Native American Women	
Credits		3

Semester 2

Choose one from the following:		3
NATV 4210	Native American Education	
CCST 3130	Chicana/o Education	
AFST 4110	Race, Culture, and Education	
Credits		3

Third Year

Semester 1

Elective Course ¹		3
Credits		3

Semester 2

BEST 400	Capstone in Borderlands and Ethnic Studies	3
Credits		3
Total Credits		18

¹ Elective Courses

See the requirements section for a full list of electives.

Chicana/o Studies - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
CCST 2110G	Introduction to Chicana and Chicano Studies	3
CCST 3110	Chicana/o History	3
CCST 3120V	Chicana/o Genders and Sexualities	3
CCST 3130	Chicana/o Education	3
Elective Courses		
Choose two from the following:		6
AFST 1110G	Introduction to Africana Studies	
AFST 2110G	African American History	
AFST 2140G	Black Women in the African Diaspora	
BEST 1110G	Introduction to Borderlands and Ethnic Studies	
BEST 300	History and Theories in Borderlands and Ethnic Studies	
CJUS 414/514	Race, Crime and Justice	
CJUS 428/528	Mexican-Americans and Issues of Social Justice	
CJUS 429/529	Immigration & Justice	
ENGL 339V	Chicana/o Literature	
ENGL 417/517	Advanced Study in Critical Theory	

ENGL 458/558	Latino/a Literature and Culture	
ENGL 489/489	Cultural Studies: Literature and Theory	
HNRS 336V	Testimonios from the Borderlands	
NATV 1150G	Introduction to Native American Studies	
NATV 2120	Native American Experience	
NATV 3120	An Indigenous Peoples History of the United States	
NATV 4110	Native American Women	
NATV 4120V	Native American Visual Culture	
POLS 378	U.S.-Mexico Border Politics	
SOCI 3410/5410	Race and Ethnic Relations	
SPAN 350	Introduction to Chicano Studies	
SPAN 385	Introduction to Chicano/US-Mexican Literature	
SPAN 421/521	New Mexico Culture and Literature	
SPAN 427/567	Chicano Literature	
SPAN 448/548	U.S.-Hispanic Film	
SPAN 451/551	Hispanic Cultures	
Total Credits		18
First Year		
Semester 1		Credits
CCST 2110G	Introduction to Chicana and Chicano Studies	3
or SPAN 350	or Introduction to Chicano Studies	
Credits		3
Semester 2		
CCST 3110	Chicana/o History	3
Credits		3
Second Year		
Semester 1		
CCST 3110	Chicana/o History	3
Credits		3
Semester 2		
CCST 3120V	Chicana/o Genders and Sexualities	3
Credits		3
Third Year		
Semester 1		
Elective Course: AFST, BEST or NATV prefix ¹		3
Credits		3
Semester 2		
Elective Course ¹		3
Credits		3
Total Credits		18

¹ Elective Courses:
See the requirements section for a full list of electives.

Native American Studies - Undergraduate Minor

Students must pass a total of 18 credits of which at least 9 of which must be upper division. ANTH 2140G Indigenous Peoples of North America or ANTH 305V Contemporary Native Americans is the required course for the minor. A grade of C- or better must be obtained for each course. Students may count S grades only in courses in which all grades are S/U, and no more than 6 hours of S credit can be accepted. Please contact Dr. Georgina Badoni (gbadoni@nmsu.edu) regarding the minor.

Prefix	Title	Credits
Requirements		
ANTH 2140G	Indigenous Peoples of North America	3
or ANTH 305V	Contemporary Native Americans	
Select 15 credits from the following: ¹		15
At least nine credits must be upper division		
ANTH 467	Archaeology of the American Southwest	
ANTH 456	Native American Intersections in Museums	
NATV 3120	An Indigenous Peoples History of the United States	
NATV 4110	Native American Women	
NATV 4120V	Native American Visual Culture	
NATV 4210	Native American Education	
NATV 4220	Federal Indian Policy	
NATV 4310	Indigenizing Methodologies in Native American Studies	
PHLS 4996	Special Topics (American Indian Health)	
POLS 326	Public Policy & Indigenous Communities	
POLS 354	Native American Politics	
HIST 413	Native American History	
HNRS 362V	Native American Philosophy and Spirituality	
Total Credits		18

¹ Course substitutions require approval of the Director of the Native American Studies minor, Dr. Georgina Badoni gbadoni@nmsu.edu.

Counseling and Education Psychology Undergraduate Program Information

The Bachelor of Science (B.S.) in Counseling and Community Psychology (CCP) prepares students to work at the bachelors level, focusing on interpersonal skills, case management, awareness of mental health issues, understanding human behavior, and multicultural awareness. Alternatively, the CCP undergraduate major prepares students for graduate school to become practitioners in the field of psychology with an additional focus on research and professional psychology practice opportunities.

Graduate Program Information

The major thrust of the Counseling and Educational Psychology (CEP) Department is the preparation of personnel for work in counseling, school psychology, counseling psychology and related areas. Five graduate degrees are available:

1. Masters of Arts (M.A.) in Clinical Mental Health Counseling
2. Specialist in Education (Ed.S.) in School Psychology
3. Doctor of Philosophy (Ph.D.) in Counseling Psychology
4. Doctor of Philosophy (Ph.D.) in School Psychology
5. Postdoctoral Masters of Science (M.S.) in Clinical Psychopharmacology

Departmental Graduate Admission Requirements

Admission requirements and procedures are specific to each degree program in the CEP department. Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to CEP graduate programs. To be considered

for admission to CEP Graduate Programs, application requirements may include, but are not limited to the following:

1. Completion and submission of NMSU on-line graduate application form and fee.
2. Unofficial transcript from every college or university you have attended. If the program decides to recommend you for admission, official transcripts must be submitted to the Graduate School. You will not be considered admitted until after the Graduate School has reviewed these materials and made a final decision.
3. Letters of recommendation from persons familiar with the applicant's academic and/or professional record (please check with the degree program to determine the number needed).
4. Curriculum vitae or resume that includes a list of completed upper-division and/or graduate coursework related to counseling, school psychology, counseling psychology, or related professions.
5. Letter of intent and/or statement of purpose (please check with the degree program to determine what the content should include).
6. Writing Sample (please check with the degree program to determine what type of writing sample is needed).
7. Interviews are required as a part of the selection process.

For more information about the CEP Department, contact the department office or visit the departmental website. For questions related to degree programs admission procedures and requirements, please contact the Program Director and/or Program Admissions Director, program websites indicate contact information for these individuals.

CEP Departmental Policy on Enrollment Restrictions for Graduate Courses

Restricted Enrollment:

Due to student demand, limited university resources and the nature of graduate training programs which lead to licensure in the helping professions, enrollment in CEP graduate level courses is restricted to those graduate students who have been admitted to both the Graduate School, as well as to the particular academic program.

This restriction also applies to persons who may wish to audit a course.

It is anticipated that certain situations may warrant an exception from the general rule limiting enrollment. The process to obtain an exception is provided in the following section.

Exception Criteria and Process:

The department head may grant exceptions to this policy, provided a screening process similar and equally rigorous to that required for admission to the program is performed. An exception must be requested before enrollment and shall include the following:

1. Consideration and validation of the reason provided by the individual requesting to enroll, which must include academic and professional qualifications relevant to the professional level of study. For example, active licensure as a psychologist is required to audit or register for courses in the postdoctoral program in Psychopharmacology.
2. Agreement from the individual that they will comply with all program requirements imposed for those who are admitted to the program, such as a background check.
3. Examples of justifications that will be considered sufficient to warrant an exception and permit students to register for graduate courses in CEP include:

- a. Previous admission by NMSU for purposes of a graduate minor in the helping professions. For example, the Minor in Integrated Behavioral Healthcare, which is also open to graduate students previously admitted to Social Work, Public Health, Nursing, and Marriage and Family Therapy programs.
 - b. Licensed graduates of the Postdoctoral MS of Clinical Psychopharmacology program who need continuing education credits to maintain competency.
4. Written, including electronic, approval from the:
 - a. Course Instructor,
 - b. Program Director, and
 - c. CEP Department Head.

Degrees for the Department

Bachelor Degree(s)

- Counseling and Community Psychology - Bachelor of Science (p. 1113)
- Counseling and Community Psychology - Bachelor of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/counseling-community-psychology-bs-online/>)

Master Degree(s)

- Clinical Mental Health Counseling - Master of Arts (p. 121)
- Clinical Psychopharmacology - (Postdoctoral) - Master of Science (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/clinical-psychopharmacology-postdoctoral-ms-online/>)
- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 125)

Specialist Degree(s)

- School Psychology - Specialist in Education (p. 204)

Doctoral Degree(s)

- Counseling Psychology - Doctor of Philosophy (p. 181)
- School Psychology - Doctor of Philosophy (p. 200)

Minors for the Department

- Counseling and Education Psychology - Undergraduate Minor (p. 1115)
- Integrated Behavioral Health Care - Graduate Minor (p. 216)
- Spanish Counseling - Graduate Minor (p. 218)

Associate Professor Elsa C. Arroyos, Interim Department Head

College Professor: C. McDougall; **Associate Professors:** E. Arroyos, G. De Necochea, M. Kalkbrenner, A. Lopez; **Assistant Professors:** A. Gantt-Howrey, B. Lee, J. Lopez-Harder, L. Peterson, S. Ramos, J. Wang; **Emeritus Professors:** E. Adams, E. Vázquez, L. Vázquez

E. Adams, Ph.D. (Ohio State University)-multiculturalism & diversity, mindfulness, supervision; **E. Arroyos, Ph.D.** (University of Iowa)- school psychology and multicultural training and competence, mentoring, and women in academia; **G. De Necochea, Ph.D.** (University of California, Santa Barbara)-outreach, access, persistence/retention, and leadership development of diverse populations of students, staff and faculty in higher education; **Alex Gantt-Howrey, Ph.D.** (Old Dominion University)-cognitive development, social determinants of health, and counselor training issues; **M. Kalkbrenner, Ph.D.** (Old Dominion University)- college student mental

health, reducing barriers to help seeking behaviors among mental health professionals, and experiential learning; **B. Lee, Ph.D.** (University of Missouri)- vocational psychology, career development, marginalized populations, multicultural counseling, multicultural/social justice training; **A. Lopez, Ph.D.** (University of Texas-San Antonio)-multicultural counseling, social justice, immigration, bilingual counseling/supervision, eating disorders and body image; **J. López-Harder, Ph.D.** (New Mexico State University)- intersectionality, culturally responsive healthcare/mental healthcare services, integrated behavioral health; **C. McDougall, Ph.D.** (University of North Dakota)-clinical psychopharmacology, cross-cultural psychology; **L. Peterson, Ph.D.** (Texas A&M University)- bilingual and multicultural school psychology, school-based mental health, professional issues in school psychology; **Sarah Ramos, Ph.D.** (New Mexico State University)- Latinas in academia, Latinx psychology, bilingual (Spanish) therapy, bilingual (Spanish) clinical training; **E. Vázquez, Ph.D.** (University of Iowa)- school psychology, assessment, psychoeducational interventions, acculturation, ethnic and linguistic diversity; **L. Vázquez, Ph.D.** (University of Iowa)- counseling psychology, multicultural curriculum development and counseling, bilingual therapy, acculturation, identity development, and phenotype research; **J. Wang, Ph.D.** (North Carolina State University)-intervention implementation fidelity and multicultural graduate training

Counseling and Educational Psychology Courses

CEPY 1120G. Human Growth and Behavior

3 Credits (3)

Introduction to the principles of human growth and development throughout the life span. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate an understanding of the scientific study of processes of change and stability throughout the human lifespan (i.e. Human Development).
2. Students will demonstrate a familiarity with the generally recognized stages of human development from conception to death.
3. Students will be able to demonstrate understanding of the normal and exceptional patterns of human development.
4. Students will be able to demonstrate understanding of recent research development regarding the identified stages of human development as they relate to gender and multicultural issues

CEPY 1150. Career Excellence

1 Credit (1)

Professional career curriculum to assist students in developing an understanding and ability to articulate who they are as emerging professionals through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting. Course does not count toward CEP minor. Spring only course offering. Restricted to: College of Education Majors only majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Demonstrate an understanding of the relationship between academic and professional career success.
2. Express a familiarity with professionalism and career culture and communicate a comprehension of various professional career skills.
3. Apply material learned to other aspects to professional excellence.
4. Develop a career life plan that will highlight goals, taking into account life circumstances.
5. Become competent in appropriate professional communication.

CEPY 1160. Academic Excellence

1 Credit (1)

The course is designed to provide you students with a foundation in their personal academic process. The course will assist students in developing an understanding and ability to articulate who they are as beginning college students through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting. Topics discussed will include time management, study skills, test taking skills, stress management, motivational and academic discipline skills, interpersonal skills and college survival skills. We intend for this to be a supportive, respectful and collaborative environment where everyone can learn and grow. Fall only course offering. Restricted to: College of Education majors.

Learning Outcomes

1. Students will be able to demonstrate an understanding of the relationship between time management and academic success.
2. Students will be able to express a familiarity with college culture.
3. Students will be able to communicate a comprehension of study skills and test taking strategies.
4. Students will be able to apply material learned to other aspects to enhance academic excellence.
5. Students will be able to develop an academic life plan that will highlight goals, taking into account life circumstances.
6. Become competent in appropriate academic communication.

CEPY 2110. Learning in the Classroom**3 Credits (3)**

This class introduces you to the basic principles of learning, including cognition, motivation, and assessment. You will examine the relationships between theory, research, and practice in learning, memory, child development, motivation, and educational assessment for the school setting. This course will provide the student with concepts and principles of educational psychology that will form a framework for thinking about learning and instruction and how theories of learning are connected to classroom situations. May be repeated up to 3 credits.

Learning Outcomes

1. Define learning and compare and contrast the factors that cognitive, behavioral, and humanistic theories believed to influence the learning process, giving specific examples of how these principles could be used in the classroom.
2. Observe and reflect upon the teaching learning processes in economically, socially, culturally and educationally diverse classroom populations in order to develop a current understanding of students and families in public and private school.
3. Discuss how theories of information processing and cognitive theories of learning can impact memory, study strategies, and how certain teaching techniques can help students learn.
4. Compare teacher-centered and student-centered approaches to learning, and to identify a positive learning environment.
5. Identify various methods to motivate students and create effective learning environments.
6. Use major concepts of child and adolescent development, human learning, and social and cultural influences in planning and implementing classroom instruction, strategies, and management.
7. Evaluate the best means of accommodating instruction to meet individual needs and differences.
8. Students will examine how learning style, cultural and social issues and learning disabilities impact the learner's effectiveness in the classroom setting.
9. Explain different types of assessment used to assess learning and provide examples of effective assessment practices. 1
10. Discuss the relationship between motivation and classroom management

CEPY 2120. The Preschool Child**3 Credits (3)**

Survey of psychological development from conception to age five. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding of major theories of early childhood development
2. Demonstrate an understanding of recognized stages of human development from prenatal to preschool years
3. Explore cultural influences that may create variability in human development
4. Apply major theories to themselves and reflect on their early childhood development.

CEPY 2130. Adolescence - School Setting**3 Credits (3)**

This course is designed to present the student with an introduction to the area of adolescent development with an emphasis on the positive aspects of this life stage. Students will be encouraged to be reflective on the topics presented in class that will include issues on diversity, culture, health, and well-being, emerging adulthood and suggestions for improving the lives of adolescents. May be repeated up to 3 credits.

Learning Outcomes

1. Students will become knowledgeable about the historical background of adolescent development.
2. Students will become knowledgeable about the major theories related to adolescence.
3. Students will evaluate different developmental theories and their fit across cultures as you reflect on your personal experiences through discussions and videos you will watch.
4. Students will identify key developmental milestones, conflicts, and concepts of each chapter presented by utilizing critical thinking skills as you complete summary questions.
5. Students will define relevant terms, ideas, and concepts in the study of adolescent development through quizzes and homework assignments.

CEPY 2140. Explorations of Counseling & Community Psychology**3 Credits (3)**

An introduction and exploration of various career options and functions within the mental health disciplines to aid in professional development. Emphasis will be placed on depth and scope of the choices available including research, teaching, community work, public policy, and clinical work and prevention (e.g. counseling, psychotherapy, assessment, consultation). May be repeated up to 6 credits.

Learning Outcomes

1. Acquire knowledge of historical and contemporary issues which affect the provision of mental health services by members of diverse mental health disciplines including clinical, counseling, school, and community psychologists, clinical mental health counselors, and others.
2. Acquire knowledge pertaining to education and training requirements for various disciplines.
3. Acquire survey-level knowledge of psychological assessment, measurement, and treatment.
4. Acquire survey-level knowledge of various inquiry approaches applicable to research pertaining to mental health and well-being—both at the individual and community level.
5. Understand the mental health recovery model and explore the lived experiences of individuals with mental health problems in contemporary society.
6. Understand the principles of sensitivity and respect for diverse populations as integral to professional practice in diverse mental health disciplines and settings, including practice in educational and community settings.

CEPY 2140H. Exploration of CCP**3 Credits (3)**

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Taught with CEPY 2140 with differentiated instruction and/or independent project to be determined. Restricted to Las Cruces campus only.

Learning Outcomes

1. Demonstrating knowledge of the basic functions of careers in counseling, community and school psychology.
2. Establishing a familiarity with the educational requirements necessary for a career in counseling, community, and school psychology.
3. Acknowledging and enhancing sensitivity and respect for diverse populations in various counseling areas; including educational and community settings.
4. Beginning to develop the interpersonal skills needed to succeed in the counseling, community and school psychology professions.

CEPY 3110. Sex Roles in Education**3 Credits (3)**

Physiological, psychological, and political aspects of sex role socialization and the effects of these factors on personal development. May be repeated up to 3 credits.

CEPY 3210V. Human Relations Training**3 Credits (3)**

Gain skills, knowledge, and sensitivity for living and working with others. May be repeated up to 3 credits.

CEPY 4110V. Introduction to Counseling**3 Credits (3)**

Principles of counseling for nonmajors. May be repeated up to 3 credits.

CEPY 4120. Introduction of Mindfulness Practice**3 Credits (3)**

Students will learn about contemplative practices through learning and participation in various mindfulness practices. Engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning. May be repeated up to 3 credits.

CEPY 4130. Addictions Prevention and Recovery**3 Credits (3)**

Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. May be repeated up to 3 credits.

CEPY 4140. Family Guidance**3 Credits (3)**

Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems. May be repeated up to 3 credits.

Prerequisite: CEPY 1120G.

CEPY 4150. Psychology, Multiculturalism and Counseling**3 Credits (3)**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.

CEPY 4150H. Psych., Multiculturalism & Counseling**3 Credits (3)**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling. Taught with CEPY 4150. Differentiated instruction/independent project to be determined.

CEPY 4997. Independent Study**1-6 Credits (1-6)**

Individual study directed by consenting faculty. May be repeated up to 6 credits.

CEPY 4998. Internship in Counseling & Community Psychology**1-6 Credits (1-6)**

Students will explore in more depth the fields of counseling, community, and school psychology professions by completing an internship. Through the completion of the internship students will gain hands on work experience, enhance sensitivity for respect with working with diverse populations, and hone their interpersonal skills needed to succeed in the counseling, community, and school psychology professions. May be repeated up to 6 credits.

CEPY 5110. Introduction to Counseling**3 Credits (3)**

Overview of counseling theory, techniques, ethics, and professional issues. Same as CEPY 4110V. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

CEPY 5120. Human Development**3 Credits (3)**

Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Non majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 5130. Multicultural Counseling**3 Credits (3)**

Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Awareness will be accomplished by assisting students in the exploration and identification of students' individual cultural assumptions(i.e. WORLDVIEW) in relation to people diverse from themselves. This will be accomplished via modeling, observations, readings, group processing and other experiential exercises.
2. Knowledge will be accomplished by exploring the question, "What is Multiculturalism" in its many forms, roles, and relationships. It will begin with the examination of the psychology of multiculturalism and the requirements of cultural competency in intercultural communications. In addition, a review of various theories of diversity (i.e. identity development, acculturation, worldview, bilingualism, and disability, to name a few) will be embedded in readings, assignments, and class discussion. Exploration of various diverse populations will also be integrated into this course.
3. Skills will focus on "How to" of multicultural competency and its practical applications to everyday interactions. Students will learn about basic issues related to assumptions that are used in communication intra-cultural and intercultural interactions.

CEPY 5150. The Art & Science of Mindfulness**1-3 Credits (1-3)**

In this course students will learn about contemplative practices by learning about and participating in various mindfulness practices for self-care and to increase well-being. Students will learn about psychological theories and research that support the use of mindfulness in helping others increase their well-being. Students will learn how to teach mindfulness to others. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. To learn about mindfulness practices for self-care.
2. To incorporate mindfulness practices into daily life.
3. To learn how mindfulness practices may increase well-being.
4. To increase students' knowledge of mindfulness theory and research.
5. To develop skills to teach mindfulness to others.

CEPY 5160. Organization and Administration of School Counseling Services**3 Credits (3)**

Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the history of school guidance/counseling and apply that knowledge to assess current trends and the quality of services provided in counseling programs with respect to the changing needs of today's diverse systems.
2. Students will learn to develop and administer a school guidance/counseling program according to professional and ethical standards developed by The American School Counseling Association's (ASCA) National Model of School Counseling.
3. Students will be introduced to a variety of technology-based career development applications, educational resources and research to promote academic advancement and social-emotional well-being. Additionally, students will explore the use of technology designed to implement, monitor, and evaluate a comprehensive school counseling program.
4. Students will gain an understanding of effective teamwork within a school setting including theories, models, and processes of consultation and change with teachers, administrators, and other school personnel. Students will explore strategies and methods of advocacy with families and communities designed to empower them to address issues of social justice within an educational system.
5. Students will build a framework for facilitating school-level individual and group counseling services. They will analyze and interpret trends in academic achievement by understanding the cultural context of the school environment as it relates to groups of students and to institutional functioning.

CEPY 5170. Professional Issues in Mental Health Counseling
3 Credits (3)

History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students should understand and demonstrate ethical decision-making processes and resources.
2. Students should demonstrate understanding of the expectations and requirements of their new professional identity.
3. Students should demonstrate knowledge of history and philosophy of the counseling profession and its specialty areas.
4. Students should demonstrate understanding of the multiple professional roles and functions of counselors across specialty areas, and their relationships with human service and integrated behavioral health care systems, including inter-agency and inter-organizational collaboration and consultation.
5. Students should demonstrate knowledge and understanding of counselors' roles and responsibilities as members of interdisciplinary community outreach and emergency management response teams.
6. Students should demonstrate knowledge and understanding of the role and process of the professional counselor advocating on behalf of the profession; advocacy processes needed to address institutional and social barriers that impede access, equity, and success for clients.

CEPY 5180. Addictions Counseling
3 Credits (3)

Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize the potential for substance use disorders to mimic and coexist with a variety of medical and psychological disorders.
2. Know the disease concept and etiology of addiction and co-occurring disorders.
3. Identify standard screening and assessment instruments for substance use disorders and process addictions.

CEPY 5210. Research Methods
3 Credits (3)

Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to critically evaluate research relevant to the practice of clinical mental health counseling.
2. Become knowledgeable of models of program evaluation for clinical mental health programs.
3. Demonstrate knowledge of evidence-based treatments and basic strategies for evaluating counseling outcomes in clinical mental health counseling.
4. Apply relevant research findings to inform the practice of clinical mental health counseling.
5. Develop measurable outcomes for clinical mental health counseling programs, interventions, and treatments.
6. Analyze and use data to increase the effectiveness of clinical mental health counseling interventions and programs.

CEPY 5220. Testing, Assessment, and Psychometric Theory
3 Credits (3)

Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Basic concepts of standardized and non-standardized testing and other assessment techniques, including norm-referenced and criterion-referenced assessment, environmental assessment, performance assessment, individual and group test and inventory methods, psychological testing, and behavioral observations (II-G-seven-b)
2. Statistical concepts, including scales of measurement, measures of central tendency, indices of variability, shapes and types of distributions, and correlations (II-G-seven-c)c.Reliability (i.e., theory of measurement error, models of reliability, and the use of reliability information) (II-G-seven-d)
3. Validity (i.e., evidence of validity, types of validity, and the relationship between reliability and validity) (II-G-seven-e)
4. Social and cultural factors related to the assessment and evaluation of individuals, groups, and specific populations (II-G-seven-f)
5. Ethical strategies for selecting, administering, and interpreting assessment and evaluation instruments and techniques in counseling (II-G-seven-g)

CEPY 5230. Counseling Theory and Technique**3 Credits (3)**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the ability to foster counseling and helping relationships that are based on studies of the counseling process in a multicultural society and include an orientation to wellness and prevention as desired counseling goals.
2. Students will be able to apply theories and models of counseling, including a systems approach, to conceptualize clients, help select appropriate counseling interventions, and so the student begins to develop a personal model of counseling based on current professional research and practice with the aid of processes provided in this course.
3. Students will demonstrate the ability to foster counseling and helping relationships that include essential interviewing, counseling, and case conceptualization skills as well as developing the ability to provide professional feedback in consultation with other trainees.
4. Students will demonstrate the ability to foster counseling and helping relationships that include developmentally relevant counseling treatment or intervention plans, the development of measurable outcomes for clients, and evidence-based counseling strategies and techniques for prevention and intervention
5. Students will be able to demonstrate counselor characteristics and behaviors that influence helping processes.
6. Students will demonstrate knowledge and ability to provide suicide prevention, crisis intervention, trauma-informed, and community-based strategies, such as Psychological First Aid.

CEPY 5235. Counseling Theory and Techniques for School Psychologists**3 Credits (3)**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. The student will demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation.
2. The student will demonstrate the ability to examine and apply critical perspectives related to counseling theory and techniques.
3. The student will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents in school settings.
4. The student will demonstrate the development of skills leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds.
5. The student will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in the schools.
6. The student will be able to collaborate with others in the process of becoming a competent school psychologist in providing counseling services in the schools.

CEPY 5240. Child and Adolescent Counseling Theory and Technique**3 Credits (3)**

Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will examine and apply critical perspectives related to counseling children and adolescents.
3. Students will compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will develop a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds.
5. Students will identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 5250. Family Therapy Theory and Technique**3 Credits (3)**

Major theories of family therapy and associated assessment, intervention and evaluation techniques. Restricted to CEP graduate majors.

Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain a systems perspective and differentiate family and other systems theories and major models of family and related interventions.
2. Students will be able to demonstrate and apply an understanding of the family life cycle and impact on family and individual functioning.
3. Students will be able to prepare and utilize various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will be able to illustrate awareness of and skill in the use of formal and informal assessment measures used in family and couple counseling.
5. Students will be able to summarize evidence-based interventions and treatments for family and couple counseling.
6. Students will be able to analyze multicultural counseling theories and techniques for diverse family types and apply multicultural and family theories to one's own experience.
7. Students will be able to demonstrate an ability to communicate and relate effectively with families and couples.
8. Students will be able to describe ethical issues related to counseling families and couples and be able to identify a process to make sound judgments.

CEPY 5260. Group Work Theory and Technique**3 Credits (3)**

Didactic and experiential learning in group theory and practice, which involves experiences in group participation and leadership. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Provide students with an intellectual understanding of group work theory and technique.
2. Provide students with an experiential understanding of group work.
3. To help students develop specific group facilitation competencies

CEPY 5270. Diagnosis and Treatment Planning**3 Credits (3)**

Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will know the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will know the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will understand current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will understand the basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified.
5. Students will know the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM).
6. Students will understand the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will know the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will understand the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will understand appropriate use of diagnosis during a crisis, disaster, or other trauma-causing event.
10. Students will be able to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 5280. Primary Care Psychology**3 Credits (3)**

Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Biologic bases of behavior as related to health/illness and coping
2. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Psychological bases of behavior as related to health/illness and coping
3. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Sociocultural bases of behavior as related to health/illness and coping
4. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Understanding and application of inter-professional collaboration
5. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: A knowledge of substance use disorders, particularly opioid use disorder and treatment in a primary care setting
6. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: How to utilize telemedicine effectively

CEPY 5310. Appraisal of Psychoeducational Achievement in a Diverse Society**3 Credits (3)**

Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Define assessment and describe the steps in the assessment process. Practitioner
2. Describe a flowchart for the screening/referral/evaluation process according to New Mexico regulations. Research, Pedagogy
3. Describe the uses of criterion and norm-referenced instruments as well as alternative forms of assessment (observation, curriculum based assessment and informal techniques). Practitioner, Effectiveness
4. Identify and discuss instruments/assessment procedures appropriate for use in identifying academic achievement, learning aptitude, vocational aptitude, performance in specific areas, and social emotional functioning. Effectiveness
5. Identify appropriate instruments/assessment procedures required for the exceptionality recognized under New Mexico regulations. Effectiveness
6. Administer and score twenty-four instruments in reading, math, written language and processing and to utilize these results in completing test interpretations and psycho-educational reports. Effectiveness
7. Interpret, report, and utilize assessment data in special education programming. Reflection, Pedagogy
8. Determine the assessment needs of students who are speakers of languages other than English. Diversity
9. Evaluate a test, write a review, and demonstrate and explain it in class. Practitioners 1
10. Synthesize information gathered through comprehensive assessment procedures into a practical whole. Assessment, Evaluation

CEPY 5320. Career/Life Planning and Vocational Assessment
3 Credits (3)

Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Career development theories and decision-making models.
2. Career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Career development program planning, organization, implementation, administration, and evaluation.
4. Interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Career and educational planning, placement, follow-up, and evaluation.
6. Assessment instruments and techniques relevant to career planning and decision making.
7. Career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 5985. Counseling Practicum
1-6 Credits (1-6P)

Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Prerequisite: CEPY 5230.

Learning Outcomes

1. Understands ethical and legal considerations specifically related to the practice of clinical mental health counseling.
2. Understands a variety of models and theories related to clinical mental health counseling, including the methods, models, and principles of clinical supervision.
3. Understands the management of mental health services and programs, including areas such as administration, finance, and accountability.
4. Demonstrates the ability to apply and adhere to ethical and legal standards in clinical mental health counseling.
5. Recognizes the importance of family, social networks, and community systems in the treatment of mental and emotional disorders.
6. Uses the principles and practices of diagnosis, treatment, referral, and prevention of mental and emotional disorders to initiate, maintain, and terminate counseling.
7. Applies multicultural competencies to clinical mental health counseling involving case conceptualization, diagnosis, treatment, referral, and prevention of mental and emotional disorders.
8. Applies effective strategies to promote client understanding of and access to a variety of community resources.
9. Demonstrates appropriate use of culturally responsive individual, couple, family, group, and systems modalities for initiating, maintaining, and terminating counseling. 1
10. Demonstrates the ability to use procedures for assessing and managing suicide risk. 1
11. Applies current record-keeping standards related to clinical mental health counseling. 1
12. Provides appropriate counseling strategies when working with clients with addiction and co-occurring disorders. 1
13. Demonstrates the ability to recognize his or her own limitations as a clinical mental health counselor and to seek supervision or refer clients when appropriate. 1
14. Maintains information regarding community resources to make appropriate referrals. 1
15. Advocates for policies, programs, and services that are equitable and responsive to the unique needs of clients. 1
16. Demonstrates the ability to modify counseling systems, theories, techniques, and interventions to make them culturally appropriate for diverse populations. 1
17. Knows the principles and models of assessment, case conceptualization, theories of human development, and concepts of normalcy and psychopathology leading to diagnoses and appropriate counseling treatment plans. 1
18. Understands various models and approaches to clinical evaluation and their appropriate uses, including diagnostic interviews, mental status examinations, symptom inventories, and psychoeducational and personality assessments. 1
19. Demonstrates skill in conducting an intake interview, a mental status evaluation, a biopsychosocial history, a mental health history, and a psychological assessment for treatment planning and caseload

CEPY 5990. Advanced Counseling Practicum**3-6 Credits (3-6P)**

Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of counseling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 5985 or consent of instructor.

Learning Outcomes

1. Obtain a minimum of one-hundred and fifty clinical hours including sixty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. Students will have the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. Students will have an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to work with clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in this course.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5997. Special Research Programs**1-6 Credits (1-6)**

Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 9 credits.

Learning Outcomes

1. Learning outcomes will vary depending on course content.

CEPY 5998. Counseling Internship**3-12 Credits (3-12)**

Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 12 credits.

Prerequisite: CEPY 5990.

Learning Outcomes

1. Obtain a minimum of six-hundred clinical hours including two-hundred and forty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. The student has the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. The student has an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to counsel clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in internship.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5999. Master's Thesis**1-15 Credits (1-15)**

Thesis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. To develop and complete master's research thesis.

CEPY 6120. Human Development**3 Credits (3)**

Same as CEPY 5120 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 6130. Psychology of Multiculturalism**3 Credits (3)**

In this advanced course for post-master's graduate students in applied fields of psychology, students will apply psychological concepts related to multiculturalism as well as critical race theories, feminist theories, queer theories, and liberation theories to understand intersecting social identities. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

Learning Outcomes

1. Students will understand and apply multicultural and pluralistic characteristics within and among diverse groups nationally and internationally.
2. Students will understand and apply theories and models of multicultural counseling, cultural identity development, and social justice and advocacy.
3. Students will understand and apply multicultural counseling competencies.
4. Students will understand and apply the impact of heritage, attitudes, beliefs, understandings, and acculturative experiences on an individual's views of others
5. Students will understand and apply the effects of power and privilege for counselors and clients.
6. Students will understand and apply help-seeking behaviors of diverse clients.
7. Students will understand the impact of spiritual beliefs on clients' and counselors' worldviews.
8. Students will understand and apply strategies for identifying and eliminating barriers, prejudices, and processes of intentional and unintentional oppression and discrimination.

CEPY 6140. Cognitive & Affective Basis of Behavior**3 Credits (3)**

This course provides an overview of cognitive and affective bases of behavior as well as the integration of cognition and affect in psychological processes. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to identify key concepts of cognition such as memory, attention and learning.
2. Students will identify the functions and roles of affect and emotional expression.
3. Students will understand the connection between cognition and affect and how these two areas of human function influence each other.
4. Students will be able to integrate and apply research findings and implications in the study of cognition and affect to practical experiences.
5. Students will apply models and theories of cognition and affect to understanding and predicting behavior.

CEPY 6150. Psychology of Social Identities**3 Credits (3)**

Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Heighten the student's awareness of multiple social identities, worldview beliefs, and other within-group variables.
2. Aid the student in developing a knowledge base in the realms of social psychology and multicultural research, culturally-responsive interventions and professional practice.
3. provide experiences for the application of this awareness and knowledge as a means of Develop the skills necessary for being a reflective decision-maker, creative problem solver, and responsive service provider for diverse individuals in a variety practice settings and intervention modalities.

CEPY 6160. History and Systems of Psychology**3 Credits (3)**

History and systems of psychology related to contemporary applied psychology. This course will focus largely on the history of modern psychology and on the major systems (or schools) of psychology. Restricted to CEP graduate majors.

Learning Outcomes

1. Effectively discuss historical and philosophical antecedents and contexts of psychology and compare and contrast multiple perspectives on important issues in this field.
2. Apply global awareness to this topic (e.g., intersecting identities; how interlocking oppressions vary by epoch, continent, nation, cultural group, region, organizational system; etc.)
3. Develop professional arguments; support opinions with reason and personal experience; and demonstrate higher order thinking and creative engagement (for definitions of terms like analyze, synthesize, evaluate, and create.
4. Develop thoughtful inquiries that inspire scholarly discourse and further investigation; consider which types of evidence are needed to find answers; and effectively facilitate respectful, thought-provoking discussions of controversies and debatable topics.

CEPY 6170. Psychology of Poverty**3 Credits (3)**

This course is designed to examine the nature, extent and impact of poverty on Southwestern populations and across the United States in relation to assessment and interventions and its impact on the education and psychological well-being of children and families. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

Learning Outcomes

1. Students will learn how views of poverty have evolved in history.
2. Students will be aware and demonstrate the skills of the different methods used to measure and understand poverty.
3. Students will identify and apply relevant issues from education, health disparities, and criminal justice related to the psychology of poverty.
4. Students will evaluate and present their own self-awareness and understanding of their worldview of poverty, along with its impact of how they view others in poverty.
5. Students will conduct self-assessments regarding their range of liberalism/conservatism; implicit bias and how it impacts their interpretation of information of poverty.
6. Students will understand and lead discussions as to why poverty remains so prevalent in U.S. society.
7. Students will be able to articulate the within group differences and similarities of racial and ethnic backgrounds or family types that are susceptible to poverty.
8. Students will learn successful interventions in working with children, adolescents and families impacted by the psychology of poverty.

CEPY 6180. Clinical Psychopharmacology**3 Credits (3)**

Basic biological aspects of psychopharmacology with applications to clinical populations and treatment implications. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and apply concepts related basic neuroanatomy, neurochemistry, and neurophysiology.
2. Students will be able to understand and apply basic knowledge related basic biological basis of the interdependence between behavior, cognition, and emotion.
3. Students will understand the pharmacology and pharmacodynamics of major drug groups used in the treatment of CNS diagnoses; including, but no limited to, antidepressants, antipsychotics, anxiolytics, anticonvulsants, and natural remedies or herbal supplementation.
4. Students will recognize the strengths and weaknesses of a wide range of research methodologies to screen compounds and test the mechanisms of action of drugs.
5. Students will understand the drug development process from target identification to FDA approval and ongoing safety surveillance.
6. Students will appreciate how pharmacological investigation informs the understanding of the underlying pathology of the illness.
7. Students will access, critique, and assimilate evidence from scientific studies as it relates to translational neuroscience and the search for promising targets for psychotropic drugs.
8. Students will become familiar with to the indication, contraindication, therapeutic drug monitoring, and effectiveness of medications across DSM-V classifications. As well as psychotropic drug tapering or switching. The implications of patient characteristic and medical co-morbidities are addressed.
9. Students will share informed opinions about advances and challenges in experimental (off-label) psychopharmacology; and of their opinions of integrated psychotherapy or combined medicine. 1
10. Students will work effectively with peers and Instructor; as part of multidisciplinary learning environment.

**CEPY 6185. Ethics, Law & Professional Issues in School Psychology
3 Credits (3)**

This course provides an introduction and overview of the profession of school psychology with emphasis on the roles, functions, and competencies of the school psychologist within the context of legal and ethical practice. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will demonstrate an understanding of various professional issues, role functions, and historical contexts related to the field of school psychology.
2. Students will demonstrate the ability to examine and apply critical perspectives related to various professional issues, role functions, and the historical contexts associated with the field of school psychology.
3. Students will explore best practices issues associated with school psychology role functions and practices.
4. Students will demonstrate the development of skills leading her or him toward becoming a culturally responsive practitioner in the field of school psychology.
5. Students will obtain knowledge of the National Association of School Psychologists (NASP) Principles of Professional Ethics (2020) and the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (2010; 2016 amendments) and learn to apply these principles to specific areas of practice such as assessment, direct and indirect intervention, consultation, and research.
6. Students will understand complexities of ethical and legal issues occurring in school settings and will develop ethical decision-making skills.
7. Students will demonstrate knowledge of the provisions of state and federal statutes such as the Individuals with Disabilities Education Improvement Act (2004), Every Student Succeeds Act (2017) and Section 504 of the Rehabilitation Act of 1973 as well as other case laws related to the practice of school psychology and learn how to apply these mandates to the practice of school psychology.
8. Students will understand the importance of developing awareness of the legal and ethical issues affecting their professional identity and the need to remain current on these issues throughout their careers as school psychologists.
9. Students will continue to emerge as critical thinkers, reflective decision-makers, and creative problem-solvers, in general.

**CEPY 6190. Ethical/Professional Issues in Counseling Psychology
3 Credits (3)**

History of counseling psychology, scientist-practitioner model, American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Focus on current ethical, professional, and scientific issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be knowledgeable of and act in accordance with the current version of the APA Ethical Principles of Psychologists and Code of Conduct, relevant laws, regulations, rules, and policies governing health service psychology at the organizational, local, state, regional, and federal levels, and relevant professional standards and guidelines; Recognize ethical dilemmas as they arise, and apply ethical decision-making processes in order to resolve the dilemmas; Conduct self in an ethical manner in all professional activities.
2. Students will develop an understanding of how their own personal/cultural history, attitudes, and biases may affect how they understand and interact with people different from themselves; Apply knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation, and service.
3. Students will be expected to behave in ways that reflect the values and attitudes of psychology, including integrity, deportment, professional identity, accountability, lifelong learning, and concern for the welfare of others; Engage in self-reflection regarding one's personal and professional functioning and engage in activities to maintain and improve performance, well-being, and professional effectiveness
4. Students will be expected to produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts; Demonstrate effective interpersonal skills and the ability to manage difficult communication well.

**CEPY 6210. School Psychology Research and Program Evaluation
3 Credits (3)**

Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will advance their foundational knowledge of research methodology and research design.
2. Students will develop skills and knowledge to conduct comprehensive literature reviews.
3. Students will critique scientific research studies by applying attained knowledge in research methodology and design.
4. Students will produce a research proposal they will conduct in their areas of interest within the field of school psychology.
5. Students will present a research proposal that will conduct within the field of school psychology.
6. Students will demonstrate skills and knowledge for program evaluation by developing a program evaluation plan.
7. Students will demonstrate knowledge and skills necessary to conduct single-subject design studies.

**CEPY 6220. Spanish for Mental Health Professionals
3 Credits (3)**

This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, CEP majors. May be repeated up to 3 credits.

Prerequisite: Enrolled in Bilingual School Psychology Training Grant with instructor consent.

Learning Outcomes

1. Students will be able to demonstrate brief, basic conversation in Spanish using mental health and health-care related expressions and terminology.
2. Students will be able to understand and respond to relevant cultural and linguistic client concerns related to presenting issues.
3. Students will be able to increase their Spanish speaking capabilities when engaged in their professional roles (e.g. conducting clinical interviews, gathering mental health histories, conducting assessments and delivering interventions using various theoretical frameworks).
4. Students will understand cultural and social factors that influence the practitioner-client relationship and communication with Latinx clients.
5. Students will be able to engage effectively in role play situations involving application of concepts learned.

**CEPY 6240. Child and Adolescent Counseling Theory and Technique
3 Credits (3)**

Taught with CEPY 5240 with differentiated assignments for Ed.S. and Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will be able to demonstrate the ability to examine and apply critical perspectives related to counseling children and adolescents.
3. Students will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will be able to demonstrate the development of a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds
5. Students will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will be able to collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 6250. Family Therapy Theory and Technique**3 Credits (3)**

Taught with CEPY 5250 with differentiated assignments for Ed.S and Ph.D students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate their comprehension of a systems perspective that provides an understanding of family and other systems theories and major models of family and related interventions.
2. Students will demonstrate an understanding of the family life cycle and impact on family and individual functioning.
3. Students will demonstrate an awareness of and develop skills with various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will demonstrate an awareness of and develop skills in using formal and informal assessment measures used in family and couple counseling.
5. Students will develop conceptual skills that demonstrate an understanding of theory and implementation of interventions.
6. Students will demonstrate knowledge about evidenced-based interventions and treatments for family and couple counseling.
7. Students will demonstrate their understanding of multicultural counseling theories and techniques for family and marital counseling.
8. Students will be able to apply multicultural and family theories to their own experience in an effort to improve your counseling work.
9. Students will demonstrate will demonstrate an ability to communicate and relate effectively to families and couples. 1
10. Students will be able to design and implement outreach and psychoeducational interventions to families and couples. 1
11. Students will demonstrate their knowledge related to ethical issues surrounding counseling families and couples and be able to make sound judgments.

CEPY 6260. Consultation**3 Credits (3)**

Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

CEPY 6265. Diagnostic Class**3 Credits (3)**

Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be expected to demonstrate the knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate understanding of current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will be expected to demonstrate understanding of basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified
5. Students will be expected to demonstrate knowledge of the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM)
6. Students will be expected to demonstrate understanding of the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will be expected to demonstrate knowledge of the the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will be expected to demonstrate understanding of the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will be expected to demonstrate understanding of the appropriate use of diagnosis during a crisis, disaster, or other trauma-causing events. 1
10. Students will be expected to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 6270. Diagnosis and Treatment Planning**3 Credits (3)**

Taught with CEPY 5270 with differentiated assignments for Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be expected to demonstrate knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate practice of using the DSM 5 to create differential diagnoses.
4. Students will be expected to construct an initial treatment plan based upon a systemic and differential diagnosis.
5. Students will be expected to formulate a culturally relevant diagnosis and treatment plan.
6. Students will be expected to discuss the barriers to assessment and treatment, as it relates to mental illness stigma.

CEPY 6275. Professional Preparation Seminar**3 Credits (3)**

This seminar course provides academic support for students enrolled in the Specialist in Education (Ed.S.) School Psychology Program in preparation for capstone experiences (i.e., internship and culminating exams) in addition to continued development of students' professional identity as School Psychologists.

Learning Outcomes

1. Students will reflect on the growth of their knowledge, experiences, and skills gained in the School Psychology Program (SPP).
2. Students will reflect on how to expand their knowledge and skills during their internship.
3. Students will prepare for securing an internship position.
4. Students will develop and articulate a professional philosophy of counseling within school psychology.
5. Students will demonstrate skill in oral and written presentations.
6. Students will understand the role of mentoring and supervision in personal and professional.

CEPY 6320. Career/Life Planning and Vocational Assessment**3 Credits (3)**

Taught with CEPY 5320 with differentiated assignments for Ed.S and Ph.D. students. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Knowledge and understanding of career development theories and decision-making models.
2. Knowledge and understanding of career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Knowledge and understanding of career development program planning, organization, implementation, administration, and evaluation.
4. Knowledge and understanding of interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Knowledge and understanding of career and educational planning, placement, follow-up, and evaluation.
6. Knowledge and understanding of assessment instruments and techniques relevant to career planning and decision making.
7. Knowledge and understanding of career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 6330. Academic & Behavioral Assessment & Intervention**3 Credits (3)**

This course introduces basic concepts, methods, and applications of academic and behavior assessment and intervention. Students will learn how to conduct functional/informal assessments of academic and behavior and how to write behavior and academic plans. Methods appropriate for assessment and intervention of school-age children will be emphasized. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors.

Learning Outcomes

1. Students will gain and demonstrate knowledge on how behavior assessment fits within psychological/psycho-educational assessment.
2. Students will demonstrate the ability to examine and apply critical perspectives related to educational assessment.
3. Students will learn the rational, defining features and theoretical underpinnings of behavioral assessment.
4. Students will learn how to conduct and complete functional assessments of behavior.
5. Students will learn how to develop and evaluate a satisfactory positive behavior intervention plan.
6. Students will develop and/or learn techniques of behavioral observation.
7. Students will learn how to integrate behavioral observation findings with other assessment methods.

CEPY 6340. Appraisal of Cognitive Functioning**3 Credits (3)**

Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will become knowledgeable about the historical background of intelligence testing.
2. Students will become knowledgeable about the major theories of intelligence.
3. Students will be able to discuss orally and in writing the pros and cons of intelligence testing and will be able to support the discussion with specific facts and research.
4. Students will be able to select "appropriate" intellectual assessment instruments for children, adolescents, and adults.
5. Students will be able to state pertinent information relative to these major intelligence tests such as age range, standardization, reliability, and validity.
6. Students will demonstrate mastery of administration, scoring, and interpretation of various norm-referenced cognitive assessment instruments while taking into consideration the cultural context of the individual.
7. The student will be able to demonstrate the ability to integrate information into meaningful written reports.

CEPY 6350. Appraisal of Personality**3 Credits (3)**

Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation, and service.
2. Produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts.
3. Demonstrate current knowledge of diagnostic classification systems, functional and dysfunctional behaviors, including consideration of client strengths and psychopathology.
4. Demonstrate understanding of human behavior within its context (e.g., family, social, societal and cultural).
5. Demonstrate the ability to apply the knowledge of functional and dysfunctional behaviors including context to the assessment and/or diagnostic process.
6. Select and apply assessment methods that draw from the best available empirical literature and that reflect the science of measurement and psychometrics; collect relevant data using multiple sources and methods appropriate to the identified goals and questions of the assessment as well as relevant diversity characteristics of the service recipient.
7. Interpret assessment results, following current research and professional standards and guidelines, to inform case conceptualization, classification, and recommendations, while guarding against decision-making biases, distinguishing the aspects of assessment that are subjective from those that are objective.
8. Communicate orally and in written documents the findings and implications of the assessment in an accurate and effective manner sensitive to a range of audiences.

CEPY 6410. Introduction to Qualitative Research**3 Credits (3)**

This course is intended to be an introduction to qualitative research methods for persons wishing to understand, apply, and conduct qualitative studies with human subjects in the fields of counseling and psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand the importance of applying and conducting culture-centered and ethical psychological research among persons from ethnic, linguistic, and racial minority backgrounds.
2. Students will understand the shift that has taken place in the past century from ignoring cultural variables to that of valuing the vast amounts of uncharted knowledge that is contained therein.
3. Students will gain a deeper understanding of the qualitative paradigm that informs research and the way we conduct and consume it.
4. Students will understand the components that make up good qualitative research considering carefully the variables that inform the proposed outcome of the study.
5. Students will assess the benefit of research to the entities, individuals and communities being studied.
6. Students will learn to be grounded in the empirical and conceptual literature on the ways that culture influences the variables under investigation, as well as psychological and social science research traditions and skills.
7. Students will be aware of their cultural assumptions on which their research questions are based (Egharevba, 2001).
8. Students will learn to be aware of, and if appropriate, to apply indigenous theories when conceptualizing research studies. They are encouraged to include members of cultural communities when conceptualizing research, with particular concern for the benefits of the research to the community (Fontes, 1998; LaFromboise, 1988).
9. Students will learn to consider the psychological (rather than demographic) contextual factors of race, ethnicity, language, gender, sexual orientation, socio-economic status, and other social dimensions of personal experience in conceptualizing their research design (Fouad Brown, 2000; Quintana et al., 2001). 1
10. Students will strive to recognize and incorporate research methods that most effectively complement the worldview and lifestyles of persons who come from a specific cultural and linguistic population; e.g., quantitative and qualitative research strategies (Hoshmand, 1989; Marin Marin, 1991; Ponterotto Casas, 1991). 1
11. Students will learn to consider culturally sensitive assessment techniques and data-generating procedures. 1
12. In analyzing and interpreting data from research studies and in proposed research, students will learn to consider cultural influences as possible explanations for their findings. 1
13. Students will learn the importance of considering the benefit to participants, and to include participants in the interpretation of results. They are encouraged to find ways for the results to be of benefit to the community, and to represent the participants' perspectives accurately and authentically.

CEPY 6420. Psychometrics**3 Credits (3)**

An introduction to psychometrics, including topics such as theory and techniques of psychological measurement, scale and inventory construction, reliability, validity, evaluation of measurement quality, classical and contemporary measurement theory, and standardization. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will acquire knowledge and skills in psychometrics.
2. Students will understand and apply psychometric theory through the completion of instrument evaluation, instrument development, and factor analysis projects.

CEPY 6425. Counseling Psychology Research**3 Credits (3)**

Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students refine their foundational knowledge of research methods.
2. Students learn how to conduct comprehensive literature reviews in counseling psychology.
3. Students learn about sampling procedures and their limitations.
4. Students refine their knowledge about measurement applied to research (including the reliability, validity, norms and cultural relevance of measurement procedures).
5. Students refine their knowledge of statistics and the application of statistics to deriving conclusions from research data.
6. Students learn about ethical issues related to conducting research.
7. Students apply knowledge and skills in the areas described above to the critique of counseling psychology research.
8. Students apply knowledge and skills in the areas described above to the development of a draft proposal for research they can conduct in their area of interest within counseling psychology.
9. Students present and defend a proposal for research in counseling psychology.

CEPY 6430. Advanced Statistics**3 Credits (3)**

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. Both hand calculation and computer packages will be employed. Open to all College of Education majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to describe procedural steps to submit proposals to the IRB at NMSU.
2. Students will be able to create data files and use SPSS to clean and examine datasets to assess data quality.
3. Students will be understand how to plan to address a research question, identify appropriate statistical tests and variables.
4. Students will be able to use SPSS to run statistical analyses to examine differences in means or relationships between two variables.
5. Students will understand how to assess assumptions and interpret findings of these analyses.
6. Students will understand key concepts, such as statistical significance, error, effect size, sample size, and statistical power of analytic approaches, findings, and interpretations of the data
7. Students will be able to effectively communicate using scientific writing and accurate portrayal of the data in terms.

CEPY 6440. Multivariate Statistics**3 Credits (3)**

Theories and techniques of multivariate statistics as applied to education and psychology. Includes multiple regression, logistic regression, MANOVA, factor analysis, and structural equation modeling. Computer packages will be the primary tool for data analysis. Open to all majors of the College of Education. May be repeated up to 3 credits.

Learning Outcomes

1. To be able to construct statistical models, both non-multivariate (e.g., multiple regression) and multivariate (e.g., MANOVA, MANCOVA), and carry out the analysis using statistical software (e.g., SPSS, R).
2. To be able to interpret results of both non-multivariate and multivariate analyses, in the context of the data.
3. To be able to generate original research questions that can be answered with quantitative methods discussed in this course.
4. To be able to carry out a quantitative method discussed in this course to answer a research question(s), and to be able to appropriately interpret the results.
5. To be able to read published research in your field of study that makes use of multivariate methods, and critically interpret the results based on the claims and evidence provided.

CEPY 6450. Educational Experimentation**3 Credits (3)**

Same as ELAD 6910. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on abilities to identify and effectively manage strengths and potential barriers that may impact progress on dissertation by thoroughly analyzing strengths and barriers and developing an action plan.
2. Conceptualize a dissertation topic that is germane to the field of Counseling Psychology and provide a convincing argument supporting the need for such research.
3. Conduct extensive and systematic literature searches for previous research and theory relevant to dissertation topic.
4. Write a comprehensive outline and annotated bibliography of the literature that incorporates the most relevant research and theoretical work associated with dissertation topic to inform literature review.
5. Clearly state research questions and hypotheses that will be examined in dissertation.
6. Create a detailed and comprehensive action plan that adheres to APA ethical guidelines for research that a reader can use to replicate dissertation study (i.e., method section).
7. Demonstrate understanding of the importance of having a diverse sample.
8. Present dissertation research to the class in a simulated proposal meeting.
9. Become more adept at providing support and challenge to student peers during weekly seminars and simulated proposal meetings. 1
10. Identify strategies for choosing and working with your dissertation committee effectively. 1
11. Demonstrate your knowledge of APA writing style.

**CEPY 6510. Practicum in School Psychology: Psychoeducational
1-6 Credits (1-6)**

Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Graded: S/U Grading (S/U, Audit). Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6340, CEPY 5310.

Learning Outcomes

1. Students will demonstrate sound diagnostic reasoning and data based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation methods.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally responsive in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues, appropriate to the functioning as a professional school psychologist.

**CEPY 6520. Field Experience in Educational Diagnostics
1-6 Credits (1-6)**

CEPY 6520 is designed to provide students with supervised school-based experiences and practices. The goal of the course is for students to master the competencies required for the delivery of academic services in the educational diagnostician role. The specific emphases in this course are placed on a data-based decision-making skills, psychoeducational assessment activities, and academic interventions. Under faculty and school-system staff supervisions, students will assume service delivery responsibilities and with increasing independence will respond to the diagnostic and intervention needs of students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Prerequisite: CEPY 6340 and CEPY 5310.

Learning Outcomes

1. Students will demonstrate sound diagnostic reasoning and data-based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation method.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions and provide recommendations for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally competent in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues.

**CEPY 6530. Practicum in School Psychology: Psychological
1-6 Credits (1-6)**

School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multifactorial, integrative, family assessments) expected of school psychologists. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 6 credits.

Learning Outcomes

1. Enhance the knowledge and skill students already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Provide students with the opportunity to respond to supervision and use supervision in a constructive manner.
3. Provide students with the opportunity to share experiences as school psychologists in training in a supportive environment.
4. Provide the students with the opportunity to engage in learning activities that will assist them in functioning independently as school psychologists (i.e., data-based decision-making and accountability).
5. Provide the instructor with the opportunity to observe the student's ability to plan and execute successful interventions and demonstrate diagnostic skills.
6. Students will be able to establish a counseling relationship with students' clients through the provision of individual and/or group counseling as stated on their IEP's.
7. Students will be exposed to current issues, theories, and practices in the field of school psychology.
8. Students will be able to integrate theory/research and practice via case presentations.
9. Students will be able to demonstrate knowledge and integration of technology in their practice as school psychologist. 1
10. Students will refine their skills in working with culturally and linguistically diverse students, families, educators, and other professionals.

**CEPY 6540. Advanced Multicultural School Psychology Field Experience
3 Credits (3)**

Supervised school psychology field experience including appraisal diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation from a multicultural perspective with diverse populations. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors.

Prerequisite: CEPY 6510, CEPY 6530.

Learning Outcomes

1. Students will enhance the knowledge and skill they already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Students will respond to supervision and use supervision in a constructive manner.
3. Students will share experiences as school psychologists in training in a supportive environment.
4. Students will engage in learning activities that will assist them in functioning independently as doctoral-level school psychologists (i.e., data-based decision-making and accountability).

**CEPY 6550. Counseling Psychology Theory/Practicum
1-6 Credits (1-6)**

Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Learning Outcomes

1. Students will refine their understanding of counseling theory and hone counseling skills through readings, lecture, demonstration, case presentation, and supervised counseling experiences.
2. Students will learn about and employ a variety of evidence-based approaches to counseling and psychotherapy that have historically been used by counseling psychologists.
3. Students will reflect on their development of an approach to counseling that is effective, theoretically sensible, and personally congruent.

**CEPY 6560. Group Work Theory/Practicum
1-6 Credits (1-6)**

Application of theory in group work with clients and in supervising group leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6550.

Learning Outcomes

1. Apply the basic elements of group theory to small groups, including principles of group dynamics, group process components, developmental stage theories, group member roles and behaviors, and therapeutic factors.
2. Demonstrate effective leadership skills and intervention strategies in simulated class discussions to actual group sessions in the community.
3. Possess knowledge of ethical and professional issues encountered by group leaders.
4. Develop awareness of the relative advantages of group work for clients and counselors, as well as other practical advantages; discern when group may not be the preferred modality for clients.
5. Distinguish characteristics of various group theories and approaches.
6. Identify relevant socio-cultural factors and multicultural considerations in group work and its impact on theory, process, and group leadership skills.
7. Communicate how they have improved their skill development relative to self-awareness and group leadership.
8. Have knowledge of professional group organizations, certifications (Certified Group Psychotherapist), and be able to effectively market group skills in preparation for the pre-doctoral internship year.

CEPY 6570. Advanced Counseling Psychology Practicum**1-6 Credits (1-6P)**

Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Graded: S/U Grading (S/U, Audit). May be repeated up to 12 credits.

Prerequisite: CEPY 6560.

Learning Outcomes

1. To increase skill level in clinical work with individual/group/couple therapy and initial intakes through practice, formal supervision, and group case discussion.
2. To integrate one's theoretical orientation into a brief practice therapy model and to improve treatment planning ability.
3. To improve treatment planning ability by increasing knowledge and integration of empirically supported interventions.
4. To increase exposure and use of assessment procedures and tools in clinical work.
5. To be cognizant of cultural/diversity issues with clients and develop enough self-awareness to respond effectively to a wide range of clients.
6. To examine professional identity concerns as they arise and increase one's knowledge base about specific areas of clinical interest.
7. To adhere to APA's Ethical Principles of Psychologists and Code of Conduct and Specialty Guidelines for the Delivery of Service by Counseling Psychologists and Guidelines for Providers of Psychological Services to Ethnic, Linguistic, and Culturally Diverse Populations, and to develop a more applied understanding of them.
8. To increase one's knowledge of relevant Mental Health Statutes and the Board of Psychologist Examiners Rules and Regulations for the state in which you are practicing (NM or TX).
9. To demonstrate self-awareness and self-reflection through ongoing self-evaluation of counseling skills. 1
10. To learn how to design and implement outreach presentations and to gain experience in consulting with interdisciplinary staff. 1
11. To become familiar with and acquire practice with career counseling and the use of career inventories.

CEPY 6580. Supervision Theory and Practicum**1-6 Credits (1-6)**

Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6530 or CEPY 6570.

Learning Outcomes

1. Students will be able to conceptualize the counseling supervision process.
2. Students will be able to understand the differences between various models of counseling supervision in order to develop a clearly conceptualized supervision theory/style.
3. Students will be able to establish an effective supervisory relationship.
4. Students will be able to demonstrate a variety of appropriately used supervision interventions.
5. Students will be able to demonstrate self-awareness through ongoing self-assessment of supervisory skills and self-reflection of your experience.
6. Students will be able to accurately assess your supervisee's abilities and developmental level.
7. Students will be able to be cognizant of cultural/diversity issues with supervisees and develop enough self-awareness to respond effectively to such issues in both supervision and counseling.
8. Students will be able to provide clear and timely feedback to your supervisee based on your on-going assessment.
9. Students will be able to demonstrate the ability to write accurate and timely supervision process and progress notes. 1
10. Students will be able to understand the differences between various models of consultation. 1
11. Students will be able to understand the major issues in consulting and its place within the counseling profession, including orienting students to their professional identities.1
12. Students will be able to understand how to orient students to their professional identities (school psychology, counseling psychology, or counseling. In addition, this course also provides supervisors an orientation to the counseling profession, including its history, counseling professional associations (e.g., the American Counseling Association), counseling licensure, roles counselors full fill in the community, and the difference between counseling and other related professions.

CEPY 6590. Behavioral Health Practicum**1-6 Credits (1-6)**

An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Learning Outcomes

1. Students will be able to apply a Biopsychosocial model of health and illness to case conceptualizations, treatment plans, and interventions at individual, group, and systemic levels.
2. Students will learn and use motivational interviewing to support patient behavior change
3. Students will learn strategies to employ telehealth services
4. Students will learn behavioral strategies for Opiate Use Disorder
5. Students will learn and perform a functional assessment of patient problems
6. Students will learn and apply evidence-based brief behavior change interventions (e.g. goal setting, self-monitoring, stimulus control, positive reinforcement, guided imagery, progressive muscle relaxation, mindfulness social support)
7. Students will describe and demonstrate behavioral health consultation skills
8. Students will demonstrate understanding of health disparities and social justice issues relevant to health care setting, patient population, and service delivery models.
9. Students will learn about ethical considerations for psychologists in health care settings

CEPY 6610. Internship in School Psychology**1-12 Credits (1-12)**

Supervised experience in school psychology. Restricted to CEP graduate majors. May be repeated up to 12 credits.

Prerequisite: CEPY 6510, CEPY 6530.

Learning Outcomes

1. Varies

CEPY 6620. Internship in Counseling Psychology I**1-18 Credits (1-18)**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. Restricted to CEP graduate majors. May be repeated up to 18 credits.

Learning Outcomes

1. Students will complete the full-time equivalent of one calendar year internship at a site accredited by the American Psychological Association (APA) that has been matched with the student through the APPIC process.

CEPY 6630. Internship in Counseling Psychology II**1-18 Credits (1-18)**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean May be repeated up to 18 credits.

Learning Outcomes

1. Varies by site.

CEPY 6640. Doctoral Internship in School Psychology**6-12 Credits (6-12)**

Supervised doctoral internship experience in school psychology. 1800 to 2000 clock hours are completed on a full-time basis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 12 credits.

Prerequisite: CEPY 6510, CEPY 6530, CEPY 6540.

Learning Outcomes

1. Varies by site.

CEPY 6996. Selected Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits.

Learning Outcomes

1. Varies

CEPY 6999. Ed.S. Thesis**1-15 Credits (1-15)**

Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

CEPY 7000. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

Office Location: O'Donnell Hall, Suite 222

Phone: (575) 646-2121

Email: cep@nmsu.edu

Website: <http://cep.nmsu.edu>

Counseling and Community Psychology - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
Choose one of the following		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one of the following		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (or higher/except MATH 1130G) ^{1,2}	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
Choose any two of the following		8
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	
or HORT 1115G	Introductory Plant Science	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	

PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
<i>Area V: Humanities</i>		
Choose one of the following		3
HIST 1105G	Making History	
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 2245G	Islamic Civilization to 1500	
HIST 2246G	Islamic Civilizations since 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
<i>Area VI: Creative and Fine Arts</i>		
Choose one of the following		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		
PSYC 1110G	Introduction to Psychology ¹	3
Viewing a Wider World ³		6
CEPY 3210V and CEPY 4110V may not be used.		
Departmental/College Requirements		
<i>Core Courses ¹</i>		
CEPY 2110	Learning in the Classroom	3
CEPY 2120	The Preschool Child	3
CEPY 2130	Adolescence - School Setting	3
CEPY 2140	Explorations of Counseling & Community Psychology	3
CEPY 3210V	Human Relations Training	3
CEPY 3110	Sex Roles in Education	3
CEPY 4120	Introduction of Mindfulness Practice	3
CEPY 4110V	Introduction to Counseling	3
CEPY 4130	Addictions Prevention and Recovery	3
CEPY 4140	Family Guidance	3
CEPY 4150	Psychology, Multiculturalism and Counseling	3
CEPY 4998	Internship in Counseling & Community Psychology	6
CJUS 416	Global Perspectives on Youth and Drug Use	3
PHIL 2110G	Introduction to Ethics	3
SOCI 3240	Sociology of the Family	3
FCSC 400	Research Methods in Family and Consumer Sciences	3
or PSYC 310	Experimental Methods	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics ¹	
MATH 2350G	Statistical Methods ¹	

Choose one from the following:	3
ANTH 1137G Human Ancestors	
ANTH 1140G Introduction to Cultural Anthropology	
ANTH 1115G Introduction to Anthropology	
ANTH 1160G World Archaeology	
ECON 1110G Survey of Economics	
ECON 2110G Macroeconomic Principles	
ECON 2120G Principles of Microeconomics	
GEOG 1120G World Regional Geography	
GEOG 1130G Human Geography	
POLS 1120G American National Government	
POLS 1110G Introduction to Political Science	
POLS 1130G Issues in American Politics	
POLS 2120G International Relations	
SOCI 1110G Introduction to Sociology	
SOCI 2310G Contemporary Social Problems	
GNDR 2110G Introduction to Women, Gender, and Sexuality Studies	
GNDR 2120G Representing Women Across Cultures	
Second Language: (not required)	
Electives, to bring to the total credits to 120^{1,4}	
Select sufficient electives from approved CEP Department list (https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology.html) to meet 120 minimum credit hours for the Bachelor degree (minimum of 24 credits required). ⁵	24
Total Credits	120

¹ A grade of C- or better is required for all CCP core courses.

² MATH 1220G College Algebra (or any MATH higher math course, excluding MATH 1130G Survey of Mathematics) is required for the degree but students may need to take any prerequisites needed to enter either MATH 1220G College Algebra or higher (excluding MATH 1130G Survey of Mathematics) first.

³ CEPY 3210V Human Relations Training and CEPY 4110V Introduction to Counseling may not be used as a VWW.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

⁵ Electives for CCP program are selected from list of approved electives.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom	3

Area VI: Creative and Fine Arts Course²		3
Credits		16
Semester 2		
COMM 1115G	Introduction to Communication	3
Choose from one of the following:		3
MATH 1350G	Introduction to Statistics ¹	
MATH 2350G	Statistical Methods ¹	
PSYC 1110G	Introduction to Psychology	3
CEPY 2120	The Preschool Child	3
Area V: Humanities (HIST course)²		3
Credits		15
Second Year		
Semester 1		
CEPY 2140	Explorations of Counseling & Community Psychology	3
Area III: Laboratory Science Course²		4
An additional Area IV: Social and Behavioral Science Course (see list from non-departmental requirements)³		3
Choose from one of the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication ¹	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
ENGL 2215G	Advanced Technical and Professional Communication	
CEPY Approved Elective Course ⁴		3
Credits		16
Semester 2		
CEPY 2130	Adolescence - School Setting	3
PHIL 2110G	Introduction to Ethics	3
Area III: Laboratory Science Course²		4
CEPY Approved Elective Course⁴		3
CEPY Approved Elective Course⁴		3
Credits		16
Third Year		
Semester 1		
CEPY 3210V	Human Relations Training	3
CEPY 4130	Addictions Prevention and Recovery (Fall Only)	3
Viewing a Wider World Course⁵		3
Choose from one of the following:		3-4
PSYC 310	Experimental Methods ¹	
FCSC 400	Research Methods in Family and Consumer Sciences	
CEPY Approved Elective Course ⁴		3
Credits		15-16
Semester 2		
CEPY 3110	Sex Roles in Education	3
CEPY 4140	Family Guidance	3
CJUS 416	Global Perspectives on Youth and Drug Use	3
CEPY Approved Elective Course⁴		3
CEPY Approved Elective Course⁴		3
Credits		15
Fourth Year		
Semester 1		
CEPY 4120	Introduction of Mindfulness Practice	3
CEPY 4110V	Introduction to Counseling	3
CEPY 4998	Internship in Counseling & Community Psychology	3

SOCI 3240	Sociology of the Family	3
CEPY Approved Elective Course ⁴		3
Credits		15
Semester 2		
CEPY 4150	Psychology, Multiculturalism and Counseling	3
CEPY 4998	Internship in Counseling & Community Psychology	3
VWW: Viewing a Wider World Course ⁵		3
CEPY Approved Elective Course ⁴		3
Credits		12
Total Credits		120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Non-Departmental Requirements (p. 1113) section of the Requirements tab for the program.

⁴ Select from approved CEP Department list (<https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology> (<https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology.html>)).

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Counseling and Education Psychology - Undergraduate Minor

A minor in Counseling and Educational Psychology (CEP) is available to the student receiving a bachelor's degree from another department in the university. The minor in CEP is designed to be useful to the undergraduate who is preparing to enter one of the helping professions such as psychology, education, social work, criminal justice or nursing. A total of 18 credits is required to obtain the CEP minor, of which, at least 9 credits must be at 300 level or above.

Students must earn a B- or better in all CEP minor courses.

Contact the CEP office for more information on the minor application process or see CEP Minor website: (<https://cep.nmsu.edu/academic-programs/minor-in-counseling-and-educational-psychology.html>)

Prefix	Title	Credits
Requirements		
Select 18 credits of CEPY electives from the following, with at least 9 credits of upper division (3000 and above):		18
CEPY 1120G	Human Growth and Behavior	
CEPY 2110	Learning in the Classroom	
CEPY 2120	The Preschool Child	
CEPY 2130	Adolescence - School Setting	
CEPY 2140	Explorations of Counseling & Community Psychology	
CEPY 3210V	Human Relations Training	
CEPY 3110	Sex Roles in Education	
CEPY 4120	Introduction of Mindfulness Practice	
CEPY 4110V	Introduction to Counseling	
CEPY 4130	Addictions Prevention and Recovery	
CEPY 4140	Family Guidance	

CEPY 4150	Psychology, Multiculturalism and Counseling
CEPY 4997	Independent Study
<hr/>	
Total Credits	18

Communication Disorders General Information

The NMSU Department of Communication Disorders offers in-person and online undergraduate programs leading to a **Bachelor of Science degree** and an in-person graduate program leading to a **Master's degree** in Speech-Language Pathology. The Master's degree in Speech-Language Pathology satisfies the educational requirements to obtain **state licensure** and **national certification** in Speech-Language Pathology.

Further information regarding the fields of Audiology and Speech-Language Pathology may be obtained on the American Speech-Language-Hearing Association (<http://www.asha.org>) website. Information about the NM license requirements can be found on the website of the New Mexico Regulations & Licensing Department (http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispensing_practices.aspx)

Undergraduate Information

The NMSU undergraduate program in Communication Disorders offers a *pre-professional* **Bachelor of Science degree** that prepares students for graduate work in Speech-Language Pathology or Audiology. Students who complete a Bachelor's degree in Communication Disorders may either go on to complete a Master's degree in Speech-Language Pathology, complete a doctoral degree in Audiology, or complete additional supervised clinical hours to become a Speech-Language Pathology Assistant (SLP-A) or Apprentice of Speech Language Pathology (ASL). Currently, the State of New Mexico does not license Speech-Language Pathology Assistants, but it may do so in the future.

Students who have declared a major in Communication Disorders are required to successfully complete a minimum of 120 credits for the Bachelor of Science degree in Communication Disorders. This includes a minimum of 48 upper division credits as well as a minimum of 9 credits from an approved list of electives.

Graduate Information

The Department of Communication Disorders at NMSU offers a **Master's degree in Speech-Language Pathology** which meets the educational requirements for certification by the American Speech-Language-Hearing Association (ASHA) (<https://www.asha.org/#https://www.asha.org/>) as well as the educational requirements for state licensure in all states within the U.S. Students entering the graduate program with an undergraduate major in Communication Disorders can expect to complete the program in two years (including the summer between the two years) and be awarded a Masters of Arts in Communication Disorders with a specialization in Speech-Language Pathology. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria which are aligned with the requirements of state and national certifying bodies for licensure and clinical certification. The graduate program for students without a background in Communication Disorders is generally one year longer because one year of leveling coursework is required.

Information for Prospective Students

The Master of Arts (M.A.) education program in speech-language pathology at New Mexico State University is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association (ASHA) (<http://www.asha.org/>), 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700.

Please apply to our graduate program in Speech-Language Pathology via the CSDCAS (<https://csdcas.liaisoncas.com/applicant-ux/#/login>). The deadline for applications is February 1st of each year.

Bachelor Degree(s)

- Communication Disorders - Bachelor of Science in Communication Disorders (p. 1122)
- Communication Disorders - Bachelor of Science in Communication Disorders (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/communication-disorders-bscd-online/>)

Master Degree(s)

- Communication Disorders - Master of Arts (p. 122)

Interim Department Head: Dr. Heike Lehnert-LeHouillier

Professors: Dr. Boutsen; **Associate Professors:** Dr. Lehnert-LeHouillier; **Assistant Professors:** Dr. Rafferty, Dr. Shivabasappa, Dr. Wilson; **College Assistant Professors:** Mrs. Borrego, Mrs. Ogaz, Mrs. Hackey; **Emeritus Professors:** Dr. Farmer, Dr. Valdez

Dr. Boutsen, Ph.D. (Southern Illinois University): motor speech disorders, voice disorders, fluency disorders, anatomy and physiology of speech mechanisms;

Mrs. Borrego, M.A., (University of Northern Colorado): adult and pediatric dysphagia, medical speech-language pathology;

Mrs. Erin Hackey, M.A., (New Mexico State University): pediatric speech and language disorders, telehealth;

Dr. Lehnert-Lehouillier, Ph.D. (State University of New York at Buffalo): speech science, speech sound disorders, autism spectrum disorders, voice disorders;

Mrs. Ogaz, M.A., (New Mexico State University): pediatric speech and language disorders, early intervention, autism spectrum disorders;

Dr. Rafferty, Ph.D. (University of Tennessee Health Science Center): adult neurogenic language disorders, EEG;

Dr. Shivabasappa, Ph.D. (All India Institute of Speech and Hearing, University of Mysore): pediatric language disorders, bilingualism, literacy;

Dr. Wilson, Ph.D. (University of New Mexico): pediatric language disorders, transcranial direct current stimulation, autism spectrum disorders;

Sign Language Courses

SIGN 1110. American Sign Language I

3 Credits (3)

American Sign Language I is an introductory level language course in the language of the American Deaf Culture. Content includes ASL vocabulary and conversational skills; linguistic features of ASL; and skills in narrative/storytelling. In-class activities, comprehension and expressive examinations, narrative and storytelling assignments in addition to semester projects are venues for students to demonstrate their learning. In addition, Deaf Culture and Deaf Community issues are addressed. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in basic conversations using ASL, such as introducing oneself, exchanging personnel information, and talking about one's surroundings.
2. Demonstrate the use of grammatical structures, including spatial referencing, use of classifiers, role shifting, ASL syntax, and non-manual signals (NMS).
3. Demonstrate clear sign production using an understanding of sign parameters: handshapes, movement, location, palm orientation, and NMS in targeted lexicon.
4. Demonstrate the use of basic ASL vocabulary and expressions necessary for conversations about real-life situations.
5. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
6. Develop culturally-appropriate behaviors and conversation strategies within a variety of contexts for interacting with people who are Deaf.
7. Demonstrate effective use of comprehension and expressive ASL skills through narrative and/or storytelling activities.
8. Describe issues of the American Deaf community and Culture.

SIGN 1120. American Sign Language II

3 Credits (3)

American Sign Language II is a continuation course that builds on concepts and skills developed in American Sign Language I. Students gain further exposure to ASL structure and grammar, and Deaf Culture and the Deaf community. Emphasis is on increasing students' ability to comprehend other signers and express themselves with more elaboration when conversing or presenting in ASL. May be repeated up to 3 credits.

Prerequisite: SIGN 1110 or consent of instructor.

Learning Outcomes

1. Further develop basic conversational skills in ASL, taking on more complicated topics.
2. Apply knowledge of ASL grammar, including classifiers, spatial referencing and agreement, role shifting, and non-manual markers.
3. Develop ASL vocabulary, fingerspelling, number, narrative and storytelling skills.
4. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
5. Demonstrate effective use of comprehension and expressive ASL skills through conversation, discussion, narrative and/or storytelling activities.
6. Demonstrate knowledge and appreciation of the American Deaf community and ASL.
7. Through first-hand experience in the American Deaf community and ASL, relate and reflect on perspectives of the community.

SIGN 2110. American Sign Language III**3 Credits (3)**

This is an intermediate level course in American Sign Language (ASL). Expected areas of intermediate skill and knowledge development include: language comprehension and production, conversational use, narratives, ASL language features and further knowledge of and interaction with Deaf culture and the Deaf community. May be repeated up to 3 credits.

Prerequisite: SIGN 1120.

Learning Outcomes

1. Demonstrate intermediate ASL vocabulary, conversation and narrative/storytelling skills.
2. Demonstrate fundamental ASL features including visual/spatial orientation, constructed dialogue and action, spatial referencing, classifiers, non-manual behaviors and syntax/word order.
3. Demonstrate appropriate use of cultural behaviors and conversational strategies.
4. Translate written and spoken English to ASL and vice versa.
5. Self-evaluate and provide feedback to peers concerning ASL usage.
6. Examine the culture of the American Deaf community through engaging in community activities and its language.

Speech & Hearing Science Courses

SPHS 2110. Introduction to Communication Disorders**3 Credits (3)**

This introductory course provides an overview of common speech, language, and hearing disorders in children and adults including etiologies, characteristics, prevention, identification, assessment and intervention. The course provides an overview of the field of speech-language pathology and audiology. May be repeated up to 3 credits.

Learning Outcomes

1. Describe normal human communication anatomy and processes as they relate to speech and language production.
2. Describe the nature of speech, language, and hearing disorders and differences.
3. Describe the principles of prevention, assessment and intervention of communication disorders.
4. List requirements for licensure, certification, and other relevant professional credentials.
5. Exhibit basic knowledge of contemporary professional issues in speech-language pathology.
6. List possible psychosocial implications of various communication disorders.
7. Identify cultural, educational, legal, and ethical issues related to communication disorders.
8. Describe the scope of practice of speech-language pathologists and audiologists.

SPHS 4510. Phonetics**3 Credits (3)**

The science of phonetics, including work with the International Phonetic Alphabet. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110; Cumulative GPA of 3.2 or better.

Learning Outcomes

1. Students will learn and be able to describe the linguistic and articulatory characteristics of speech sounds.
2. Students will be able to identify, recall and extrapolate information about the biological bases of speech sound production.

SPHS 4520. Audiology**3 Credits (3)**

Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, and a minimum of 3.2 GPA.

Learning Outcomes

1. Describe the properties of sound.
2. Define the terms used to describe hearing and hearing loss.
3. Describe the anatomy and physiology of the auditory system at an introductory level.
4. Identify basic audiometric procedures.
5. Interpret basic audiometric test findings.
6. Recognize common auditory (and related) disorders.
7. Discuss basic approaches to managing auditory (and related) disorders.

SPHS 4610. Language Acquisition**3 Credits (3)**

This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110; Cumulative GPA of 3.2 or higher.

Learning Outcomes

1. Describe the development of phonology, semantics, morphology, syntax, and pragmatics.
2. Describe biological, cognitive, social aspects of language acquisition.
3. Describe the current methods for studying language acquisition and critically evaluate their contributions to our understanding of how children learn language.
4. Describe and critically evaluate current theories of language acquisition in relation to the available data and to each other.
5. Apply basic observational methods to draw conclusions about a child's level of language knowledge.

SPHS 4620. Speech and Hearing Science**3 Credits (3)**

Basic concepts and theories in acoustics, speech production and speech perception. Includes laboratory experience with instrumental measurement and analysis of speech systems. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110, SPHS 4510, SPHS 4520; and minimum 3.2 GPA.

Learning Outcomes

1. Students will learn basic acoustic physics and be able to describe simple harmonic motion, complex waveforms, and resonances.
2. Students will learn about the acoustic consequences of the three articulatory parameters tongue height, tongue advancement, and lip rounding during vowel production in order to be able to understand the acoustics of vowels and diphthong acoustics.
3. Students will learn the acoustic properties of English consonants including stops, fricatives, affricates, liquids, glides, and nasals.
4. Students will learn about speech perception, including categorical perception, theories of speech perception as well as some basic psychoacoustic properties such as the decibel scale.

SPHS 4710. Speech Disorders Across the Lifespan**3 Credits (3)**

Bases, symptoms, etiologies, and clinical management of issues related to disorders of articulation, phonology, voice and resonance, and fluency. Restricted to: CD majors. May be repeated up to 3 credits.

Prerequisite: SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, and SPHS 4610; and minimum 3.2 GPA.

Learning Outcomes

1. Describe diverse etiologies of speech disorders and compare/contrast assessment procedures (ASHA Standard III-B)
2. Define and compare/contrast the classification for a variety of speech disorders. (ASHA Standard III-C)
3. Differentiate between a speech disorder vs a difference that can be attributed to culturally and linguistically different groups. (ASHA Standard III-D)
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of speech disorders. (ASHA Standard III-D)

SPHS 4715. Language Disorders Across the Life Span**3 Credits (3)**

Bases, symptoms, etiologies, and treatment of language disorders. Includes review of normal language acquisition. May be repeated up to 9 credits.

Prerequisite: SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4610, SPHS 4620, 3.2 cumulative GPA.

Learning Outcomes

1. Describe diverse etiologies of language disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of language disorders. (ASHA Standard III-C).
3. Differentiate between a disorder vs a difference that can be attributed to culturally and linguistically different groups. (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of language disorders. (ASHA Standard III-D).

SPHS 4720. Anatomy and Physiology of Speech Mechanisms**3 Credits (3)**

Structure and function of systems underlying human speech sound production and processing, including respiratory, phonatory, and articulatory components. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, and SPHS 4610; and minimum 3.2 GPA.

Learning Outcomes

1. Students will learn and be able to identify respiratory anatomy important for speech production.
2. Students will be able to identify, recall and extrapolate information about respiratory physiology.
3. Students will learn and be able to identify laryngeal anatomy important for speech production.
4. Students will be able to identify, recall and name important physiological mechanisms for controlling vocal function.
5. Students will learn and be able to identify supraglottal anatomy important for speech production.
6. Students will be able to identify, recall and name physiologic events about resonance and articulation.

SPHS 4810. Clinical Methods and Procedures**3 Credits (3)**

Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4610; and minimum 3.2 GPA.

Learning Outcomes

1. Demonstrate basic use of professional terminology in the area of Speech-Language Pathology
2. Demonstrate knowledge of principles and techniques of the observation of nonverbal and verbal behavior of clients and clinicians using oral and written reporting, as well as in-class discussions.
3. Complete twenty-five clock hours of supervised clinical observation of speech, language, and hearing services.

SPHS 4820. Neural Bases of Communication Disorders**3 Credits (3)**

Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, SPHS 4610, SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4710, SPHS 4720, SPHS 4810 and minimum 3.0 GPA.

Learning Outcomes

1. Demonstrate knowledge of the gross anatomy and physiology of the central, peripheral, autonomic nervous systems.
2. Understand the clinical manifestations associated with injury/disease to a given regions/systems within the nervous system.

SPHS 4830. Aural Rehabilitation**3 Credits (3)**

Overview of hearing aids and amplification devices including cochlear implants. Review of the bases and psychosocial aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLPs. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4610, SPHS 4710, SPHS 4720, SPHS 4810; and minimum 3.2 GPA.

Learning Outcomes

1. Define and use the appropriate terminology when discussing hard of hearing and deafness.
2. Describe and explain the effects of hearing impairment on speech-language acquisition and auditory/speech perception.
3. Describe the effects of hearing impairment on various aspects of life (e.g., cognitive, educational, occupational, and psycho-social aspects in all age ranges).
4. Identify the communication needs and develop a basic understanding of common intervention options including communication strategies, auditory training, speech reading, hearing aids, assistive devices, and cochlear implantation.
5. Be acquainted with the relevant public laws.

SPHS 5110. Research Methods**3 Credits (3)**

Introduction to basic qualitative, quantitative, and single subject research methodology in speech-language pathology and audiology. Restricted to CD,CDS majors. May be repeated up to 3 credits.

Prerequisite: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate knowledge of the concepts of research ethics and integrity including protection of human subjects.
2. Demonstrate comprehension of concepts of evidence-based practice.
3. Locate, use, and critically evaluate library and online sources that support the investigation of research questions pertinent to speech-language and hearing science.
4. Interpret basic single variable and two-variable statistical procedures appropriate for single and group designs.
5. Read, abstract, and critically evaluate pertinent research.

SPHS 5120. Assessment of Communication Disorders**3 Credits (3)**

Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate knowledge of testing statistics and basic concepts in psychometric assessment.
2. Formulate, implement and summarize one complete successful and efficient assessments: including pre-planning meeting, interview design and implementation, administration of instruments, analysis and integration of results and report writing.
3. Review, summarize and critique one assessment tool for design, use, interpretation and cultural/linguistic inclusivity to classmates.
4. Given case study information, students will be able to: choose an appropriate instrument from assessment tools reviewed; develop an assessment plan for a client; write a report and develop treatment goals.

SPHS 5130. Pediatric Language and Disorders**3 Credits (3)**

Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Minimum grade of B and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate a working knowledge of the major theories of language acquisition and theoretical perspectives of disorders.
2. Demonstrate an understanding of the aspects related to dialect and second language acquisition of English.
3. Demonstrate knowledge of the core principles of language assessment for the pediatric population (zero-five year old).
4. Summarize and interpret content material relating to pediatric language development/disorders.

SPHS 5140. Speech Sound Disorders**3 Credits (3)**

Advanced study of the symptoms, etiologies, assessment, and clinical management of speech sound disorders including those due to cleft palate and disorders of resonance. May be repeated up to 3 credits.

Prerequisite: A minimum grade of B in all graduate courses and a minimum overall GPA of 3.0 is required.

Learning Outcomes

1. Course Goals – Fulfillment of the following Standards of the American Speech-Language-Hearing Association (ASHA): IV-B, IV-C, IV-D, and IV-F: Students will be able to explain the classification of speech sounds based on different phonological theories, and they will be able to phonetically transcribe standard and non-standard speech. Summative Assessment: Test 1 (IV-B, IV-C)
2. Students will be able to describe the impact of anatomical, motor, sensory, cognitive-linguistic, and social factors in speech development, and developmental profiles associated with developmental and syndromic conditions. Summative Assessment: Test 2 (IV-C)
3. Students will be able to identify appropriate assessment tools and practice their use for the diagnosis of speech sound disorders. Formative Assessment: Project 1 (IV-D)
4. Students will learn to research different treatment approaches for the successful remediation of speech sound disorders and to integrate research into evidence-based clinical practice. Formative Assessment: Research Article Presentation Treatment Presentation (IV-F)
5. Students will familiarize themselves with current research in the area of speech sound disorders as well as foundational original research papers in the field. Formative Assessment: Research Article Presentation (IV-F)

SPHS 5210. School Age Language and Disorders**3 Credits (3)**

Normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A minimum grade of B in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate a working knowledge of legislation governing service provision in the schools (IDEIA, NCLB) and implementation practices (IEP, five-hundred-four plan, RtI).
2. Demonstrate knowledge of normal language development of school-age children.
3. Demonstrate understanding of language disorders relevant to school-age children.
4. Demonstrate knowledge of evidence-based intervention methodologies for the treatment of language disorders in the school-aged population.

SPHS 5220. Aphasia & Cognitive Linguistic Disorders**3 Credits (3)**

Etiologies, diagnosis, assessment, and treatment of adult aphasia and cognitive-linguistic disorders. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Describe the nature, prevention, assessment, and intervention of aphasia and cognitive communication disorders in adults.
2. Describe cognitive and social aspects of communication, psychological, neurologic, and cultural correlates, as well as other types of diversity (i.e., age, gender, etc.) as it relates to aphasia in adults.
3. Describe the nature of normal cognitive processing, including attention, memory.
4. Apply theory of cognitive and social aspects of communication, psychological, neurologic, and cultural correlates, as well as other types of diversity (i.e., age, gender, etc.) as it relates to aphasia and cognitive communication disorders.
5. Identify ethical issues related to treatment regarding aphasia and cognitive communication disorders.

SPHS 5230. Fluency Disorders**3 Credits (3)**

Speech fluency development and the disorders of stuttering, cluttering, and neurogenic dysfluency. Restricted to: C DS,C D majors.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Define/describe terminology and nomenclature associated with the study of human fluency disorders.
2. Identify constitutional and environmental conditions that contribute to fluency disorders.
3. Propose methods of assessing and treating the affective, behavioral and cognitive aspects of fluency disorders across the lifespan, including the use of augmentative devices for fluency.
4. Be able to explain the role of counseling in treating fluency disorders and how that role changes with the age of the client.
5. Be able to explain the role of counseling in treating fluency disorders and how that role changes with the age of the client.

SPHS 5310. Introduction to Augmentative and Alternative Communication**3 Credits (3)**

Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Graduate standing; overall GPA of 3.0.

Learning Outcomes

1. Understand and consider physical and psycho-social, linguistic, and cognitive characteristics of AAC users.
2. Describe assessment methods to determine the best fit of AAC systems to meet the needs of AAC users.
3. Understand how to provide training in the use of various AAC systems for AAC users, their families, and caregivers and educators.

SPHS 5320. Acquired Neurogenic Communication Disorders**3 Credits (3)**

Topics include attention, memory, executive function, and underlying neuropathologies, with emphasis on assessment, diagnosis, prognosis, treatment and recovery processes in cognitive communication disorders related to traumatic brain injury, dementia, and right hemisphere brain damage. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0.

Learning Outcomes

1. Compare, contrast, and differentiate neural bases and etiologies for TBI, RHD, and Dementia.
2. Assess deficits in cognitive-linguistic communicative competence.
3. Recommend and design appropriate management plans for individuals with cognitive-linguistic impairments.
4. Recognize the significance of culture, age, and ethnicity on the assessment and treatment of cognitive-linguistic communication disorders.
5. Reflect on and prepare clients and families for the impact of cognitive-linguistic impairments and re-entry to school, work, family, and/or the community.

SPHS 5330. Dysphagia**3 Credits (3)**

Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Define the anatomy and physiology of normal swallowing and causes of abnormal swallow in the pediatric to geriatric age ranges.
2. Define dysphagia team components.
3. Describe protocol for clinical and instrumental dysphagia evaluation.
4. Describe dysphagia diagnosis and treatment.

SPHS 5340. Motor Speech Disorders**3 Credits (3)**

Advanced studies of dysfunction of the nervous system that affect speech. Includes evaluation, diagnosis, and treatment of speech apraxias and dysarthrias. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Recognize evaluate motor speech disorders - differentiating between flaccid, spastic, unilateral upper motor neuron, ataxic, hypokinetic, hyperkinetic, mixed dysarthria, as well as apraxia.
2. Identify the etiology of the various motor speech disorders.
3. Demonstrate knowledge of methods to assess the various subsystems (resonance, articulation, phonation, and respiration) and determine relative contribution of each system to the motor speech disorder.
4. Demonstrate knowledge of various interventions for clients with various motor speech disorders.

SPHS 5350. Voice Disorders/Head and Neck Anomalies**3 Credits (3)**

Advanced studies of anatomy and physiology of the vocal tract with emphasis on diagnosis, assessment, and treatment of voice disorders, laryngectomy, cleft palate, and other oral-facial anomalies. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Recognize and describe relevant anatomy and physiology of normal voice production, including laryngeal and respiratory anatomy and physiology
2. Identify and discuss structural, neurologically-based, and functional voice disorders.
3. Demonstrate knowledge of approaches to assess voice disorders, including objective and subjective measures.
4. Explain and demonstrate selected intervention techniques for voice disorders.

SPHS 5360. Communication Disorders in Neurodiverse Populations**3 Credits (3)**

This course is primarily aimed at providing meaningful foundations for the application of evidence-based intervention designs that enhance the development of communication skills for individuals with Autism Spectrum Disorders across the lifespan. May be repeated up to 6 credits.

Learning Outcomes

1. Identify and implement evidence-based interventions for individuals with ASD across a range of ages and abilities
2. Evaluate several evidence-based interventions and determine the best fit based on a client scenario
3. Discuss key features of evidence-based interventions for individuals with ASD
4. Implement evidenced communication interventions with individuals with ASD

SPHS 5410. Professional Issues and Multicultural Practices in Communication Disorders**3 Credits (3)**

This course includes a range of topics pertinent to students entering professional practice as speech-language pathologists including current legal, cultural, ethical, and clinical service provision issues. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Minimum of 3.0 GPA.

Learning Outcomes

1. Describe current issues in professionalism, ethics, and liability in the profession of Speech-Language Pathology.
2. Understand setting-specific employment issues, including working with culturally and linguistically diverse populations.
3. Understand the procedures necessary for obtaining licensure and certification by state and national agencies, as well as maintenance requirements for licensure and certification in Speech-Language Pathology.

SPHS 5510. Advanced Spanish Morpho-Syntax for Education**Professionals****3 Credits (3)**

This class has been designed for Heritage Speakers of Spanish who work in educational settings. It will cover the essential linguistic theory and fundamental structures of the Spanish language. This includes, but is not limited to, verb morphology, morphosyntactic and syntactic structures. The main goal of this course is to determine what usages fall within the norms of an individual's speech community, or if there are elements that fall outside those norms. Students have to be fluent in Spanish as course will be conducted in Spanish.

SPHS 5520. Best Practices in Bilingual/Multicultural Assessment for Practitioners**3 Credits (3)**

The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

SPHS 5988. Clinical Education**1 Credit (1)**

This course is specifically designed to target the knowledge base necessary to initiate clinical practicum in the CD Program. The learning objectives are based upon the Council of Academic Accreditation in Audiology and Speech-language Pathology (CAA) standards and knowledge areas. These learning outcomes are developed to assist students in clinical practicum and are specific to the services provided to clients of the NMSU Edgar R. Garrett Speech and Hearing Center. Restricted to: C DS,C D majors. May be repeated up to 2 credits.

Corequisite: SPHS 5990.

Learning Outcomes

1. Demonstrate an understanding of successful strategies to work with families and clients from various clinical settings/cultural backgrounds.
2. Demonstrate an understanding of ethical and confidential service delivery.
3. Identify characteristics of properly written clinical reports.
4. Demonstrate skill in oral and written or other forms of communication sufficient for entry into professional practice.
5. Demonstrate knowledge of entry level and advanced certifications, licensure, and other relevant professional credentials.

SPHS 5989. Externship in Communication Disorders**3-9 Credits (3-9)**

This course is designed to provide opportunities for the developing clinician to provide treatment to and evaluations for clients in a full term externship experience under the supervision of a licensed SLP. Restricted to: C DS majors. May be repeated up to 9 credits.

Learning Outcomes

1. Various

SPHS 5990. Practicum in Speech-Language Pathology

1-4 Credits (1-4)

Supervised clinical practice in a variety of speech, language, and hearing disorders. Practicum includes diagnostic, treatment, and management work through direct patient/client contact. Attendance at weekly clinical staff meetings is required. Restricted to: C DS,C D majors. May be repeated up to 15 credits.

Prerequisite: Good standing in the graduate school; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Various

SPHS 5996. Special Topics

1-9 Credits (1-9)

Individual and/or group study of special topics identified by subtitle. Restricted to: C DS majors. May be repeated up to 9 credits.

Prerequisite: Prior arrangement with faculty; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Varies

SPHS 5999. Master's Thesis

1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Various

Name: Dr. Heike Lehnert-LeHouillier, Interim Department Head

Name: Yvette Claeys, Administrative Assistant

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Communication Disorders - Bachelor of Science in Communication Disorders

The Communication Disorders curriculum provides specialized preparation for students who would like to work as Speech-Language Pathology Assistant (SLP-A) and those who plan to enter a graduate program in speech-language pathology or audiology. Students supplement their academic study of typical communication development, communication disorders, and clinical management with observation of the clinical experience in the department's Edgar R. Garrett Speech and Hearing Center and/or via alternative clinical education such as virtual patients. Students must maintain a grade of B or better in all Speech Language Hearing Sciences (SPHS) courses and maintain a cumulative GPA of 3.2 or higher, to remain in the program.

The undergraduate program fulfills all educational requirements needed for certification as Speech-Language Pathology Assistant (SLP-A) by the American Speech-Language-Hearing Association. Details regarding certification are available from the American Speech-Language-Hearing Association (<http://www.asha.org/certification/>) (ASHA), and for those seeking a license as Apprentice in Speech-Language (ASL) in New Mexico, information can be found on the website of the New Mexico

Regulations & Licensing Department (http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispersing_practices.aspx)

Professional employment opportunities for speech-language pathologists and audiologists are numerous within settings such as school systems, community clinics, medical centers, hospitals, private practice, residential programs, and schools for individuals with disabilities.

Program Requirements

Required coursework (120 credits; minimum 48 upper-division credits)

Electives to meet the 120 minimum credit hours for this degree can either come from any minor that a student chooses to pursue or any other elective courses not counting elsewhere towards the degree. Recommended minors for this degree are Linguistics, Spanish, or Counseling and Educational Psychology.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
<i>General Education</i>		
<i>Area I: English and Communication</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Choose one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra (or higher) ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
PSYC 1110G	Introduction to Psychology	3
Choose one sequence from the following:		4
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
Choose one from the following:		4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	

CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	

Area V: Humanities

Choose one from the following:		3
ENGL 1410G	Introduction to Literature	
ENGL 2520G	Film as Literature	
ENGL 2310G	Introduction to Creative Writing	
ENGL 2650G	World Literature I	

Area VI: Creative and Fine Arts

Choose one of the following:		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	

General Education Elective

SOCI 1110G	Introduction to Sociology	3
or SOCI 2310G	Contemporary Social Problems	

Viewing a Wider World Courses (must be from two different colleges) ² **6****Departmental/College Requirements**

SPHS 2110	Introduction to Communication Disorders	3
SPHS 4510	Phonetics	3
SPHS 4520	Audiology	3
SPHS 4610	Language Acquisition	3
SPHS 4620	Speech and Hearing Science	3
SPHS 4710	Speech Disorders Across the Lifespan	3
SPHS 4715	Language Disorders Across the Life Span	3
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	3
SPHS 4810	Clinical Methods and Procedures	3
SPHS 4820	Neural Bases of Communication Disorders	3
SPHS 4830	Aural Rehabilitation	3

Non- Departmentals Requirements (in addition to Gen.Ed/VWW)

CEPY 1120G	Human Growth and Behavior	3
or PSYC 2120	Developmental Psychology	
CEPY 4110V	Introduction to Counseling	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
or PSYC 301	Introduction to Psycholinguistics	
LING 302V	Language and Society	3
or LING 303	Exploring Language Systems	
Choose one from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
A ST 311	Statistical Applications	

Choose one from the following:		3
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	

Second Language: (see below)

SIGN 1110	American Sign Language I ³	3
or SPAN 1110	Spanish I	
SIGN 1120	American Sign Language II ³	3
or SPAN 1120	Spanish II	
Electives, to bring total credits to 120 ⁴		24
15 credits must be upper-division		
Total Credits		120

¹ MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

³ SPAN 1110 Spanish I/SPAN 1120 Spanish II or an advanced Spanish course

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
Choose two from one of the following:		6
PSYC 1110G	Introduction to Psychology	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
Credits		13

Semester 2

COMM 1115G	Introduction to Communication	3
MATH 1350G	Introduction to Statistics ¹	3
SOCI 1110G	Introduction to Sociology	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
or PSYC 301	Introduction to Psycholinguistics	
Minor (or Elective) Course		3
Credits		15

Second Year

Semester 1		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	4
SPHS 2110	Introduction to Communication Disorders	3
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication ¹	

ENGL 2215G	Advanced Technical and Professional Communication	
Minor (or Elective) Course		3
CEPY 1120G or PSYC 2120	Human Growth and Behavior or Developmental Psychology	3
Credits		16
Semester 2		
PHYS 1125G	Physics of Music	4
Choose from one of the following:		3
ENGL 1410G	Introduction to Literature	
ENGL 2520G	Film as Literature	
ENGL 2310G	Introduction to Creative Writing	
ENGL 2650G	World Literature I	
Choose from one of the following:		3
LING 302V	Language and Society	
LING 303	Exploring Language Systems	
Minor (or Elective) Course		3
Minor (or Elective) Course		3
Credits		16
Third Year		
Semester 1		
SPHS 4510	Phonetics (Fall Only) ¹	3
SPHS 4520	Audiology (Fall Only) ¹	3
First Course in Second Language Series (ASL or SPAN)		3
Minor (or Elective) Course		3
Minor (or Elective) Course		3
Credits		15
Semester 2		
SPHS 4610	Language Acquisition (Spring Only) ¹	3
SPHS 4620	Speech and Hearing Science (Spring Only) ¹	3
Next Course in Second Language Series (ASL or SPAN) ¹		3
Minor (or Elective) Course		6
Credits		15
Fourth Year		
Semester 1		
SPHS 4720	Anatomy and Physiology of Speech Mechanisms (Fall Only) ¹	3
SPHS 4710	Speech Disorders Across the Lifespan (Fall Only) ¹	3
SPHS 4715	Language Disorders Across the Life Span (Fall Only) ¹	3
VWW: Viewing a Wider World Course ³		3
Minor (or Elective) Course		3
Credits		15
Semester 2		
SPHS 4810	Clinical Methods and Procedures (Spring Only) ¹	3
SPHS 4820	Neural Bases of Communication Disorders (Spring Only) ¹	3
SPHS 4830	Aural Rehabilitation (Spring Only) ¹	3
VWW: Viewing a Wider World Course ³		3
Minor (or Elective) Course		3
Credits		15
Total Credits		120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Kinesiology

Undergraduate Program Information

The Department of Kinesiology provides students with the education necessary to pursue careers in allied health sciences (Athletic Training, Medical School, Physician's Assistant, Physical and Occupational Therapy, Chiropractic Medicine, Nursing, Ultrasound, Radiography, etc.) Physical Education, Dance, and various careers in the fitness and wellness industry. Details of the degree programs and their respective concentrations are provided below.

The department also offers minors in Dance and Exercise Science.

Graduate Program Information

The Ph.D. in Kinesiology encompasses opportunities for focused study in physiological, biomechanical, psychological, and pedagogical domains of human movement. Program emphasis is placed on the acquisition of skills needed for high-quality research and innovative teaching. Students are expected to become proficient in research methods within their respective areas of interest. The program prepares students for postdoctoral or faculty positions in higher education or positions in applied sports and clinical settings. Students are expected to work with specific faculty members to explore interests in Exercise Physiology, Biomechanics, Strength & Conditioning, Sport Psychology, Motor Behavior, Aging, Physical Education, and Dance.

Admission

The Department of Kinesiology offers a Doctorate of Philosophy (Ph.D.) in Kinesiology. To maximize consideration for admittance (for a recommended August start date), candidates should submit applications by January 15 of that same year.

Students are admitted to the graduate program based on their potential for achievement in research, scholarship, and teaching. The most promising applicants will be accepted. Because the number of students the department can successfully accommodate is limited, it will not always be possible to admit all qualified applicants. The admissions committee will consider any material that a candidate for admission wishes to present. Application forms and instructions are available through the graduate school (<https://gradschool.nmsu.edu/>). The minimum application consists of the following:

1. A completed Graduate School admission application.
2. Complete transcripts of all college work, reflecting a bachelors and a masters degree - preferred (or 30 hours of graduate work) in a related field of study, and a minimum cumulative GPA of 3.0 in prior degree programs.
3. Scores on the Graduate Record Examination (GRE) (there is no minimum requirement; however, scores will be considered during the admission process).
4. Three letters of recommendation from professors, employers, or others qualified to evaluate your potential for successful graduate work.
5. A curriculum vitae or resume.

6. A personal statement explaining how graduate work at NMSU fits your educational and career goals.
7. A reference to the specific member whose work is of particular interest to you.
8. A letter of support from at least one faculty member from the Department of Kinesiology and Dance indicating an interest in guiding you through your program of studies.

Degrees for the Department

Bachelor Degree(s)

- Dance (Contemporary Dance) - Bachelor of Arts in Dance (p. 1148)
- Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology (p. 1151)
- Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology (p. 1153)
- Kinesiology (Physical Education) - Bachelor of Science in Kinesiology (p. 1155)

Master Degree(s)

- Athletic Training - Master of Science (p. 95)

Doctoral Degree(s)

- Kinesiology - Doctor of Philosophy (p. 194)

Minors for the Department

- Dance - Undergraduate Minor (p. 1157)
- Exercise Science - Undergraduate Minor (p. 1158)

Faculty and Administration

Interim Department Head: Christopher A. Aiken, PhD

Professors Oliver, Post **Associate Professor** Lee, True **Assistant Professor** Aiken, Kim, Smoak, Wright*, Yoder **College Associate Professor** Meyer, O'Connell **College Assistant Professor** Aranda **College Instructor** Gregory

*Visiting faculty member

C. A. Aiken, PhD (Louisiana State University)- Kinesiology Program Director Motor Behavior; **R.S. Aranda, MS** (College Assistant Professor - Physical Education, New Mexico State University); **M. Gregory, MA**, Clinical Coordinator AT (College Instructor - Athletic Training, New Mexico State University); **J. Kim, PhD** (Assistant Professor - Biomechanics, Texas Women's University); **S. Lee, PhD** (Associate Professor - Exercise Physiology, Florida State University); **S. Meyer, MS** (College Associate Professor - Kinesiology, University of Idaho); **K. O'Connell, MS**, Athletic Training Program Director, (College Associate Professor - Athletic Training, California University of Pennsylvania); **K. Oliver, PhD** (Professor - Physical Education, Virginia Polytechnical Institute); **P. G. Post, PhD** (Professor - Sports Psychology, University of Tennessee); **P. Smoak, PhD** (Assistant Professor - Exercise Physiology, University of Northern Colorado); **L. True, PhD**, Graduate Program Coordinator, (Associate Professor - Motor Behavior, Michigan State University); **A. Wright, MA**, Dance Program Director (Visiting Assistant Professor - Dance - Sam Houston State University); **H. Yoder, PhD** (Assistant Professor - Exercise Physiology, The University of Alabama)

Dance Courses

DANC 1110G. Dance Appreciation

3 Credits (3)

This course introduces the student to the diverse elements that make up the world of dance, including a broad historic overview, roles of the dancer, choreographer and audience, and the evolution of the major genres. Students will learn the fundamentals of dance technique, dance history, and a variety of dance aesthetics. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. Explain a range of ideas about the place of dance in our society.
2. Identify and apply critical analysis while looking at significant dance works in a range of styles.
3. Identify dance as an aesthetic and social practice and compare/contrast dances across a range of historical periods and locations.
4. Recognize dance as an embodied historical and cultural artifact, as well as a mode of nonverbal expression, within the human experience across historical periods and cultures.
5. Use dance to consider contemporary issues and modes of thought.

DANC 1130. Ballet I

1 Credit (1)

This course is the beginning level of ballet technique. Students learn the basic fundamentals and performance skills of ballet techniques, which may include flexibility, strength, body alignment, coordination, range of motion, vocabulary, and musicality. May be repeated up to 2 credits.

Learning Outcomes

1. Apply fundamental movements of ballet techniques.
2. Enhance flexibility, strength, body alignment, coordination, balance, kinesthetic awareness, range of motion, and musicality.
3. Employ basic theories of classical ballet placement and proper alignment.
4. Develop basic ballet terminology, variations in timing and changes of facing, and barre and center combinations.

DANC 1131. Introduction to Ballroom Dance

1 Credit (1)

An introduction to ballroom dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Smooth and International Standard dances. Offered every Fall. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Ballroom dances in American and International styles
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Demonstrate improved overall physical capability, musicality, and movement memory
5. Appreciate Ballroom dancing as an artform and a discipline

DANC 1135. Introduction to Argentine Tango**1 Credit (1)**

An introduction to Argentine Tango at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, as well as the history and culture of the form. Offered Spring of even years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of Tango and Argentine Tango
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Articulate the cultural and historical underpinnings of these forms as World dances
5. Demonstrate improved overall physical capability, musicality, and movement memory
6. Appreciate Tango as an artform and a discipline

DANC 1140. Flamenco I**1 Credit (1)**

This course introduces the student to the art of flamenco and its cultural features and significance. Students will learn the fundamentals of this art form and introductory techniques and skills, which may include handwork, footwork, postures, and specific dances. May be repeated up to 2 credits.

Learning Outcomes

1. Demonstrate a basic level of competency in the principles of alignment, anatomy, coordination, mobility, stability, and stamina.
2. Demonstrate fundamental flamenco techniques relative to spatial awareness, rhythm, phrasing, and sequencing.
3. Demonstrate competency with basic flamenco movement vocabulary.
4. Perform a variety of flamenco dances, poses, steps, hand movements, and combinations.

DANC 1150. Modern Dance I**1 Credit (1)**

Modern Dance techniques and styles. Students are introduced to proper warm-up techniques, body alignment, control and flexibility. Students work with various rhythms and combinations of movements. The course emphasizes dance technique and creative experience. The history, terminology and philosophy of Modern Dance are also discussed. May be repeated up to 2 credits.

Learning Outcomes

1. Use a more developed sense of muscle control and strength, stretch and balance, coordination.
2. Demonstrate and verbalize an increased awareness of Modern Dance techniques
3. Execute dance phrases, combining several movements and in more than one rhythm.
4. Demonstrate an increased awareness of musicality while dancing and use Modern Dance Techniques creatively.

DANC 1185. Introduction to Country Western Dance**1 Credit (1)**

An introduction to Country Western Dance at the beginning level. Students will learn the fundamentals of technique and several dances, including Country Western Two-Step, Nightclub Two-Step, Polka, and Line Dance. Offered Fall of odd years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Country Western social dances.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Country Western dancing as an artform and a discipline.

DANC 1220. Introduction to Latin Social Dance**1 Credit (1)**

An introduction to Latin social dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Rhythm and International Latin dances. Offered every Spring. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Latin dances in American and International styles.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Latin dancing as an artform and a discipline.

DANC 1235. Introduction to West Coast Swing Dance**1 Credit (1)**

An introduction to West Coast Swing dancing at the beginning level. Students will learn the fundamentals of technique of several Swing forms and the Hustle, including basic steps, partnering, and musical forms. Offered Fall of even years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of both West Coast Swing and the Hustle.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Swing dancing as an artform and a discipline.

DANC 2130. Ballet II**2 Credits (2)**

Intermediate level of ballet technique; Introduction of more advanced Ballet vocabulary at barre/center work; increase flexibility, strength, body alignment, and coordination for practice of steps/combinations with variations in timing and changes of facing. Restricted to Las Cruces campus only. May be repeated up to 8 credits.

Learning Outcomes

1. A successful student will be able to understand and execute with accuracy all the steps presented on the take home quizzes and are encouraged and expected to attend at least two semesters of each level in order to advance to the next level of ballet technique

DANC 2150. Modern Dance II**2 Credits (2)**

Modern II is designed to further the student's abilities in modern dance technique, to enhance efficient use of weight and momentum, to release held patterns in the body's mechanics, to enrich spatial awareness, and to begin work on performance techniques. May be repeated up to 8 credits.

Learning Outcomes

1. Improve accuracy in alignment and shape
2. Improve precision in space, in timing and rhythm, and in focus/intent
3. Learn combinations and movement dynamics quickly
4. Begin to integrate performance techniques while working in the classroom setting
5. Use a concentrated attitude and an open, creative mind to approach the work in an artistic manner unique to your abilities
6. Listen, see and apply all the information given within one class period and over the semester
7. Self-awareness and mindfulness: how much space do you take in the class and why? How aware are you of those around you, and those you are dancing with?
8. Release of weight to create controlled momentum
9. Locating center and moving from there

DANC 2157. Hip-Hop Dance**2 Credits (2)**

An introduction to hip hop dance and its relationship to other aspects of hip-hop culture, music, and media, with an emphasis on creativity, individuality, and expression. Coursework may include street styles, breaking, and various regional forms. No previous dance experience is expected. May be repeated up to 6 credits.

Learning Outcomes

1. Recognize and articulate the fundamentals of various styles of hip hop dance technique and vocabulary.
2. Contextualize the history and cultural aspects of hip hop dance.
3. Examine the relationship between dance and other aspects of hip hop culture such as music and media representation.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate hip hop dance as an artform and a discipline.

DANC 2270. Dance Improvisation**2 Credits (2)**

An introduction to the practice of dance improvisation focusing on play and discovery as methods for generating movement and exploring the full potential of the communicative, authentic body in motion. Course content includes concepts in Body, Effort, Shape, Space, Kinesthetic Response, Scoring, and Contact. Offered Spring of even years.

Prerequisite: DANC 1150.

Learning Outcomes

1. Understand the core concepts of exploration and authenticity and the importance of these ideas to a modern dancer and choreographer.
2. Demonstrate immediacy of presence, both physically and mentally, in the way that they responding to both choices and instincts in the moment.
3. Connect the concepts learned in Modern dance technique to the study of dance improvisation and the concepts of this class to outside work as dancers, students, and citizens.
4. Access the constantly expanding movement vocabulary which will inform their work moving forward in dance technique and composition.
5. Improvise confidently both individually and as part of a group.

DANC 2310. Bronze American Rhythm**2 Credits (2)**

Bronze level American Rhythm patterns, techniques, and partnering with emphasis on elements of dance. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in American Rhythm
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2311. Bronze American Smooth**2 Credits (2)**

Bronze level American Smooth patterns, technique, and partnering with an emphasis on the elements of dance. May be repeated up to 4 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in International Latin
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2320. Bronze International Latin**2 Credits (2)**

This is the style of Latin dance that is danced around the globe and is featured in the World DanceSport Championships. Students will learn the Bronze Level figures and techniques in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Material for the International Latin Syllabus
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance more advanced levels

DANC 2321. Bronze International Standard**2 Credits (2)**

This is the style of Ballroom dance that is performed around the globe and is featured in the World DanceSport Championships. Learn the Bronze Level figures and techniques in five (5) International Style dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on understanding technical elements of dance, memorizing and performing routines. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in International Standard
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2460. Dance for Musical Theatre**2 Credits (2)**

This course will supplement the dance technique curriculum specifically in support of the study of Musical Theatre. Students will practice various social, world, and theatrical dance forms, learn selections from iconic choreography, experience mock dance auditions, and explore the skill of dance composition for musical theatre repertory. Offered every Spring. May be repeated up to 4 credits.

Prerequisite: DANC 1130 or DANC 1160.

Learning Outcomes

1. Participate successfully in dance techniques and styles outside of the basic tap, jazz, ballet, and modern dance curriculum.
2. Recognize and contextualize musical theatre history and repertory through exposure to significant historical choreography and choreographers.
3. Understand and excel at the skill of taking part in a musical theatre dance audition.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate the practice of musical theatre dance as an artform and a discipline.

DANC 3110. DanceSport Pedagogy: Smooth**3 Credits (3)**

In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in the four (4) American Style Smooth Ballroom Dances to include the Waltz, Foxtrot, Tango and Viennese Waltz. Students will gain practical teaching experience in the area of Group Class Instruction with required in class practicums. May be repeated up to 12 credits.

Prerequisite: DANC 2311.

Learning Outcomes

1. Students will understand several philosophies of teaching
2. They will gain teaching skills through practical experience.
3. The students will teach both group and private lessons.
4. The student will gain knowledge about learning styles.

DANC 3114. DanceSport Ensemble**1 Credit (1)**

Involvement with the DanceSport performance ensemble rehearsal and performance process. May substitute for 1 credit of the Contemporary Dance Ensemble course in the Dance Major. May be taken in every semester of undergraduate study or for up to 8 hours credit. Students can enroll by audition only. Consent of the instructor is required. May be repeated up to 8 credits.

Learning Outcomes

1. Collaborate in the process of creating a work of Latin or Ballroom dance.
2. Participate in the process of producing a dance concert with fully realized technical elements including lighting and costumes.
3. Apply the knowledge and skills that are being developed in the study of dance technique, choreography, and pedagogy to the culminating performance experience.
4. Demonstrate a more developed sense of artistry, energy, ingenuity, and presence onstage.

DANC 3130. Ballet III**2 Credits (2)**

The theory and practice of ballet technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. May be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.

Prerequisite: DANC 2130.

Learning Outcomes

1. Achieve a greater clarity of line, released use of turnout, and expressivity in port de bras and epaulement, demonstrating improved adagio and allegro skills at the advanced level.
2. Experience the idiosyncrasies of the Cecchetti, Vaganova, and Bournonville techniques and differentiate the Romantic, Classical, Neo-Classical, and Contemporary styles.
3. Apply experience from other disciplines such as modern dance to the exercise of ballet, referencing concepts such as body patterning and energy pathways.
4. Demonstrate an increased level of physical and artistic achievement and professionalism.

DANC 3150. Modern Dance III**2 Credits (2)**

The theory and practice of modern dance technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. Course may be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.

Prerequisite: DANC 2150.

Learning Outcomes

1. Delve into movement concepts with a greater sense of risk and challenge at the advanced level.
2. Achieve an increased mastery of alignment, control, and efficiency, taking full advantage of the knowledge of body patterning and energy pathways.
3. Improvise solo, in an ensemble, and with a partner, demonstrating the application of instinct and choice in the authentic body.
4. Increase the student driven problem-solving skill that is essential to a professional modern dance artist.
5. Demonstrate a high level of physical and artistic achievement.

DANC 3250. Contemporary Dance Ensemble**1 Credit (1)**

Involvement with the Contemporary performance ensemble rehearsal and performance process, which may include faculty or student-produced choreography, performance in up to 3 concerts per academic year, and travel to festivals or conferences. Course content will also include practical experience in theatrical production and design for concert dance. This course should be taken by dance majors for at least 4 semesters. May be taken in every semester of undergraduate study or for up to 8 hours credit. By audition only. Permission of the instructor is required. Course should be taken in conjunction with any Ballet or Modern Dance technique class. Student can enroll by audition only. Consent of the instructor is required. May be repeated up to 8 credits.

Learning Outcomes

1. Collaborate in the process of creating a work of concert dance.
2. Participate in the process of producing a dance concert with fully realized technical elements including lighting and costumes.
3. Apply the knowledge and skills that are being developed in the study of dance technique, choreography, and pedagogy to the culminating performance experience.
4. Demonstrate a more developed sense of artistry, energy, ingenuity, and presence onstage.

DANC 3265. Principles of Choreography I**3 Credits (3)**

An introduction to the basic tools of dance composition, beginning with improvisation and including body, space, time, energy, and elements of design. Offered Fall of even years.

Prerequisite: DANC 2270.

Learning Outcomes

1. Understand the core improvisational concepts of exploration, authenticity, instinct, and choice, and the importance of these ideas to a modern dancer and choreographer.
2. Connect the concepts learned in Modern I to the study of dance improvisation and composition and the concepts of this class to outside work as dancers, students, and citizens.
3. Build a constantly expanding movement vocabulary.
4. Recognize and use the basic components of dance composition- body, space, time, and energy- and explore the roles of invention and communication in the creation of contemporary dances.
5. Develop the communication skills necessary to articulate and defend academic and artistic choices and to give and receive feedback.
6. Begin building a body of creative work and developing a sense of personal values as an individual and as an artist.

DANC 3310. Silver American Rhythm**3 Credits (3)**

Silver level American Rhythm patterns and technique with emphasis on performance. May be repeated up to 9 credits.

Prerequisite: DANC 2310.

Learning Outcomes

1. To enhance advanced dance sport skills beyond Bronze Level

DANC 3311. Silver American Smooth**3 Credits (3)**

Silver level American Smooth patterns and technique with emphasis on performance. May be repeated up to 9 credits.

Prerequisite: DANC 2311.

Learning Outcomes

1. Advance introductory skill levels and enhancing technique towards Gold level

DANC 3320. Silver International Latin**3 Credits (3)**

Students will learn Silver Level syllabus figures in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and Bronze Level figures in Paso Doble. Continued training and practice in International Style Latin dance technique. May be repeated up to 9 credits.

Prerequisite: DANC 2320.

Learning Outcomes

1. Learn and work towards mastery for the four different styles of dances in Dance Sport

DANC 3321. Silver International Standard**3 Credits (3)**

Learn Silver Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on increased technical understanding to increase their ability in partnering and musicality. May be repeated up to 9 credits.

Prerequisite: DANC 2321.

DANC 3350. Dance Pedagogy I**3 Credits (3)**

This course will include discussion of human development, body patterning, teaching methods, the structure and analysis of course content, and educational values as they apply to teaching creative movement and dance technique. Student must have one semester each of ballet and modern technique or permission of the instructor to enroll. Offered Spring of odd years.

Prerequisite: DANC 2130 and DANC 2150.

Learning Outcomes

1. Understand the basic progression of human development and how the study of Creative Movement and Dance can aid in that development physically, cognitively, and emotionally.
2. Recognize basic sociological and developmental demographic factors and determine how to develop lessons that are appropriate, safe, and constructive.
3. Communicate clearly, assertively, thoughtfully, appropriately, and constructively, recognizing communication as a vital skill in education.
4. Expand upon an existing syllabus of terminology, rhythmic structures, and movement vocabulary that is necessary in a comprehensive elementary dance education.
5. Practice executing a basic dance class structure including short and long-term lesson plans and a variety of teaching methods.
6. Begin developing a system of personal values and a philosophy of education that will engender an effective, ethical, and responsible teaching practice.

DANC 3510V. World Dance**3 Credits (3)**

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HNRS 347V. May be repeated up to 3 credits.

Learning Outcomes

1. An understanding of the social importance of dance in diverse cultural settings
2. A familiarity with the importance of dance as a vehicle through which various identities (i.e. cultural, gender and personal), roles (i.e. social and status) and values (i.e., personal and cultural) are identified and expressed.
3. An understanding of dance as a form of non-verbal communication.
4. The ability to discuss and compare culture's dance forms.
5. The ability to recognize how other art forms, religions, and political climates affect cultural identity.

DANC 3610. Dance History**3 Credits (3)**

A survey of dance history from ancient Greece to the 21st century. Major emphasis on the development of dance as a Theatrical artform, on Ballet and Modern dance in Europe, Russia, and the U.S., and on criticism and theory of choreography and performance. Offered Fall of even years.

Learning Outcomes

1. Quantify factual knowledge of the progression of dance including primitive forms, court dance, ballet, and modern dance.
2. Recognize and contextualize important choreography, dancers, choreographers, composers, events, and phenomena in the history of Western Theatrical dance.
3. Discuss some of the root problems that dance historians face, such as the imperfect nature of documentation.
4. Understand how history shapes contemporary practices in dance.
5. Watch dance critically in order to derive choreographic intention and meaning in the work.
6. Articulate and support an informed point of view, both verbally and in writing, about works of concert dance.

DANC 3710. Somatics and Anatomy of Movement**3 Credits (3)**

This course combines the study of human anatomy and physiology with the principles of Somatics in various forms to address dance movement in terms of body connectivity, efficiency, and access to full physical capability. Student should complete one semester of Modern Dance technique before enrolling. Offered Fall of odd years.

Learning Outcomes

1. Understand the mechanics of basic human anatomy and physiology, including but not limited to bones, muscles, and joints, and explore the way that this quantitative knowledge can help in understanding and developing the dancer's kinesthetic ability.
2. Recognize the vitality of basic components of wellness, including nutrition and injury prevention and treatment, and the impact that these issues have on dance as a professional practice.
3. Integrate the basic principles of various somatic fields outside of ballet and modern dance technique into their personal artistic practice and understand the ways that these additional methods can enhance their physical capability.
4. Apply their knowledge of physiology, wellness, and somatic systems to the study and practice of dance pedagogy.

DANC 3720. Dance, Technology, and Design**3 Credits (3)**

This course explores the integration of technology into the creative process, focusing on projects in graphic design and filmmaking. Students will learn the fundamentals of photography, publicity design, sound editing and design, film documentation of live dance, and Dance for the Camera, and will be introduced to software including Photoshop and Final Cut. Offered Spring of odd years.

Prerequisite: DANC 3265.

Learning Outcomes

1. Demonstrate proficiency with some of the relevant technology, software, and tools that are used in producing digital images and video.
2. Effectively promote themselves and their work in their communities and online as 21st century artists and professionals must be prepared to do.
3. Think more broadly about the capabilities of their creative work, beginning with the choreographic process, with respect for the way that technology can enhance the artform of concert dance, and produce choreography in non-traditional formats.
4. Apply the skill of articulating specific and purposeful artistic choices, as is also being developed in technique, pedagogy, and composition classes.

DANC 4250. Dance Pedagogy II**3 Credits (3)**

The theory and practice of dance pedagogy focusing in greater depth on technique and branching into professional preparation, including dance studio management. Coursework will include application of somatic and anatomical principles and diverse teaching methods in many disciplines, plus the creation of a business plan and professional portfolio. Outside field experience in teaching dance technique will be required. Offered Spring of even years.

Prerequisite: DANC 3350.

Learning Outcomes

1. Demonstrate a deepening understanding of both theoretical and practical aspects of dance pedagogy, organizing the knowledge, skills, and artistic content of dance into effective, ethical, and responsible teaching practices.
2. Give and receive constructive critical feedback to and from their peers.
3. More effectively communicate with their students to answer questions and address concerns in the classroom.
4. Integrate artifacts, readings, and teaching tools which facilitate critical thinking and technical development in the dance class.
5. Prepare and implement a plan to establish and run a school of dance as a business.
6. Continue formulating an expanding system of educational values regarding the rights and responsibilities of the teacher, the student, and the institution.

DANC 4265. Principles of Choreography II**3 Credits (3)**

Using the tools introduced in Principles of Choreography I, students will explore new methods of generating movement, delving into language, rhythmic and musical studies, props and architecture, sources of inspiration, and meaning making. Students will also be guided to consider the integration of technical and theatrical elements into the choreographic process and the relationship between their artistic work and their personal and social values. Offered Fall of odd years.

Prerequisite: DANC 3265.

Learning Outcomes

1. Surpass the principles learned in Choreography I to create increasingly complex contemporary work, informed by new points of inspiration, broader subject matter, and greater relevance.
2. Demonstrate a deepening understanding of the choreographic process as an exercise in Meaning-Making, using an unlimited movement vocabulary applied with absolute clarity.
3. Articulate the choices in craft and intention that are the underpinnings for the creation of work that is reflective of the artist's personal and social values.
4. Create a wide and diverse body of work, utilizing multiple dancers, various styles of music, and varied creative processes.

DANC 4266. Advanced Independent Projects**1-3 Credits (1-3)**

Independent work in dance practice, pedagogy, composition, or theory under faculty guidance. Intended to allow the student to broaden their experience and expertise in an artistic or academic area of dance beyond the published coursework. This course may substitute for Special Topics within the dance major if a project of sufficient depth and rigor is proposed. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrate development in the skill of self-driven learning.
2. Apply strong practices of inquiry and discovery, developed in other cross-disciplinary coursework, to their own personal areas of research and creative interest.
3. Exhibit a deeper understanding of specific artistic, academic, or theoretical field within the study of dance, reflective of the student's goals and values.

DANC 4310. Gold American Rhythm**3 Credits (2+2P)**

Advanced level American Rhythm dance technique and partnering work with choreography and performance emphasized. Includes cultural history and pedagogy methods. May be repeated up to 6 credits.

Prerequisite: DANC 3310.

Learning Outcomes

1. To enhance dance sport skills beyond Silver Rhythm

DANC 4311. Gold American Smooth**3 Credits (3)**

Gold level American Smooth technique and choreography with an emphasis on performance and competition dancing. May be repeated up to 9 credits.

Prerequisite: DANC 3311.

Learning Outcomes

1. Continue to work towards mastery of dance sport perfection through advanced training

DANC 4320. Gold International Latin**3 Credits (3)**

Students will complete all syllabus figures through the Gold level in the Rumba, Cha Cha, Samba, Jive and Paso Doble. Advanced training and practice in International Style Latin dance technique. May be repeated up to 9 credits.

Prerequisite: DANC 3320.

DANC 4321. Gold International Standard**3 Credits (3)**

Students will learn Gold Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on physical and cognitive mastery of standard dance technique and elements as well as high-level performance ability, musicality and choreography. May be repeated up to 9 credits.

Prerequisite: DANC 3321.

DANC 4610. DanceSport Certification Preparation**3 Credits (3)**

The Professional Certification process offers extraordinary benefits to dance teachers, deeply enriching their dancing and teaching, and greatly expanding their career opportunities. This intensive course is designed to fully prepare students in taking the DVIDA and/or ISTD exams in the Smooth, Rhythm, Standard or Latin dances depending on course offered. See subtitle for specific style being taught in schedule of classes. May be repeated up to 12 credits.

DANC 4710. Senior Project**3 Credits (3)**

As a capstone to the undergraduate study of dance, majors will select a research topic of interest to them and use the information gathered to inform the choreographic or pedagogical process. The project will include both academic and creative components. Students must be in Senior standing. Consent of Instructor required.

Learning Outcomes

1. Synthesize the complete undergraduate study of dance technique, performance, pedagogy, and choreography.
2. Connect the practice of academic research to the choreographic or pedagogical process.
3. Demonstrate a reinforced understanding of dance as an art form and the essential practices of creation, communication, meaning making, and reflection.
4. Present a professional portfolio appropriate to a dance artist, including a cover letter, CV, resume, and statement of teaching philosophy.

DANC 4996. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

DANC 4997. Problems**1-6 Credits (1-6)**

Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

Physical Education Courses

PHED 1110. Dance:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1230. Individual Sport:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1290. Team Sport:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1310. Swim I:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1320. Aqua Fit:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1410. Yoga:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1430. Pilates:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1510. Training:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1620. Fitness:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1630. Career Fitness:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 10 credits.

Learning Outcomes

1. Varies

PHED 1670. Aerobics:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1830. Running:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

PHED 1910. Outdoor Experience**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 2996. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. Each offering will carry appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

Sports Medicine (Athletic Training & Kinesiology)

SPMD 1110. Introduction to Athletic Training**3 Credits (3)**

Introduction to the principles of athletic training. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the historical development of athletic training and sports medicine.
2. Understand the knowledge and experiences needed to become a Certified Athletic Trainer.
3. Understand the specific responsibilities and duties of an athletic trainer.
4. Understand the diverse jobs settings within the profession of athletic training.
5. Understand the relationship between the athletic trainer and the sports medicine team.
6. Understand some of the general and specific injuries and medical conditions that occur in athletics; their causes, signs and symptoms, treatments, rehabilitation, and prevention.
7. Understand some of the contemporary issues and problems facing the athletic training profession.

SPMD 1120. Medical Terminology**3 Credits (3)**

Study of the structure of medical language with emphasis on sports medicine-related terminology. To include analysis and interpretation of medical documentation. Restricted to: Las Cruces campus only.

Learning Outcomes

1. Master the fundamentals of word analysis, including the separation of terms into word roots or combining forms, common prefixes, and suffixes.
2. Differentiate types of medical terms and the relationships among terms.
3. Develop a proficiency in the use of physiological and anatomical terms as reflected in medical documents.
4. Master the terms, words, phrases, and symbols that describe the human body in its various states of health and disease, including essential anatomical terms.

SPMD 1190. Clinical Practicum I**2 Credits (2)**

Introduction to the clinical aspects of the athletic training education program. Must maintain at least 3.0 GPA. May be repeated up to 4 credits.

Learning Outcomes

1. The Athletic Training Program application procedures.
2. The ability to perform selected taping and wrapping techniques.
3. Knowledge of HIPAA guidelines, pre-participation physical examinations, environmental illnesses, the history of Athletic Training and its governing bodies, Evidence Based Practice and its implications in the field of athletic training, evaluation procedures for the injured athlete, NMSU AT program and its affiliated clinical sites.
4. Proper documentation for the athletic training environment including SOAP notes.

SPMD 1195. Clinical Practicum II**3 Credits (3)**

Athletic training related content and psycho-motor skills are introduced, enhanced, and assessed in the classroom and clinical rotations.

Emphasis is on competencies and proficiencies previously instructed in didactic courses while providing increased depth of understanding and clinical practice. Must maintain a 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge and skill in emergency situation prevention, recognition, and management.
2. Demonstrate proficiency in basic skills of musculoskeletal injury recognition and management.
3. Demonstrate competency in basic pre-participation exam skills, including but not limited to taking vital signs.
4. Demonstrate competency in wound care and first aid.

SPMD 1310. Introduction to Kinesiology**3 Credits (3)**

An introduction to the field of Kinesiology which will explore areas such as exercise physiology, sport and exercise psychology, motor behavior, biomechanics, strength and conditioning, exercise prescription, as well as professional and graduate programs, and allied health and applied careers opportunities.

Learning Outcomes**SPMD 1350. Social Foundations of Physical Activity****3 Credits (3)**

Historical and cultural foundations and vocational, scientific, and educational data on careers in health education, physical education, and recreation.

Learning Outcomes

1. Improve students' knowledge of foundations of physical education. (Research) (Standard 4 j, k, l, m, o, p)
2. Improve students' abilities to analyze current physical activity issues based on historical, philosophical, sociological, and psychological perspectives. (Research) (Standard 4 l, m, e, g)
3. Improve students' knowledge of and ability to critically analyze how gender, race, social class, sexual orientation, and ability issues affect physical education and performance programs. (Research, Diversity) (Standard 4j, k, l, m, o; Standard 2 d, g, j, f, k)
4. Improve students' knowledge of forces influencing the development of physical education programs. In particular, attitudes, values, and beliefs about gender, race, social class, sexual orientation, and ability, etc. (Diversity, Practitioners, Reflection, Pedagogy) (Standard 1 a, b, h, l; Standard 4 j, k, l, m, o; Standard 2 a, d, g, j, f, k)
5. Improve students' knowledge of strategies for becoming an advocate in the school and/or community to promote a variety of physical activity opportunities. (Practitioners) (Standard 2 m, n; Standard 3 n, o, p, q, r; Standard 10 d, j, p)
6. Improve students' knowledge of current educational issues and trends. In particular, socio-cultural issues that affect educational, fitness, and sports settings. (Diversity, Research) (Standard 4 j, k, l, m, o, p Standard 9 a, c, e, f, m, n)
7. Improve students' knowledge of how students' learning is influenced by individual experiences, talents, and prior learning, including language and family/community values and conditions. (Diversity, Research) (Standard 1 b, h, l; Standard 2 d, g, j, k, m, n, o; Standard 3 l)
8. Improve students' knowledge of the impact of international changes on the content of physical education, fitness, and sports programs. (Research) (Standard 4 j, k, l, m, o, p)
9. Improve students' ability to critically analyze how gender, race, sexuality and social class issues affect how we view the body, and how these views can affect students' health and participation in physical education, fitness, and sports programs. (Diversity, Reflection) (Standard 2 d, g, j, f, k, m, o) 1
10. Improve students' ability to become critically aware of how their feelings, beliefs, and values in relation to gender, race, social class, sexual orientation, and ability issues will affect their abilities to work as professionals in the fields of physical education, sport, or fitness. (Diversity, Reflection) (Standard 2d, g, j, f, k, m, o Standard 9 e, d, g, l, m) 1
11. Improve students' knowledge of and ability to critically analyze cultural stereotypes of diverse populations of people. (Diversity) (Standard 2 d, g, j, f, k, m, o) 1
12. Improve students' knowledge of how cultural stereotypes influence the development of physical education, fitness and sport programs. (Research, Diversity) (Standard 2 d, g, j, f, k, m, o; Standard 4 j, k, m, o, p, q Standard 8 p) 1
13. Improve students' knowledge of how groups influence individuals, and how individuals influence groups in a democratic society.

SPMD 2130. Emergency Response in Sports Medicine**2 Credits (2)**

Designed to provide knowledge and experience in emergency care procedures, blood borne pathogens, and first aid. Students will receive certification in CPR/AED for the Professional Rescuer and in First Aid, upon successful completion of course. May be repeated up to 4 credits.

Prerequisite: Consent of Instructor.

Learning Outcomes

1. Identify the individuals involved in the Emergency Response Team
2. Construct the components of an effective emergency Action Plan
3. Assess the scene and patient during an emergency situation
4. Demonstrate proper universal precautions and wound care
5. Demonstrate effective Cardiopulmonary Resuscitation, AED use
6. Demonstrate effective Rescue Breathing Airway Management techniques
7. Demonstrate effective splinting techniques
8. Demonstrate understanding of the techniques utilized in cervical stabilization
9. Identify components of acute care for general medical and orthopedic emergencies.

SPMD 2210. Anatomy and Physiology I**3 Credits (3)**

Detailed study of the structure and function of the human musculoskeletal, cardiovascular, respiratory, and peripheral nervous systems. Designed specifically for students interested in allied health professions.

Learning Outcomes

1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2210L. Anatomy and Physiology Laboratory**1 Credit (1P)**

Students will engage in activities designed to enhance appreciation of the anatomical structures related to the content areas for SPMD 2210. Restricted to Las Cruces campus only.

Learning Outcomes

1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2250. Fitness for Health and Sport**3 Credits (3)**

A study of the fitness needs for health enhancement and sport participation.

Learning Outcomes

1. Recognize the importance of incorporating positive fitness/wellness habits within one's lifestyle in terms of enhancing longevity, disease prevention, and overall quality of life.
2. Examine various physiological benefits and adaptations to such factors as muscular strength, muscular endurance, cardiovascular fitness, flexibility, and body composition when certain stimuli are applied to each. Assessment of these characteristics will be witnessed primarily in practical experiences within the course's laboratory settings.
3. Identify current trends and/or health patterns within society in regards to scientific findings, declination in health habits, and increases in health ailments.
4. Compare various nutritional concepts, specifically proper dietary habits and their impact on weight management aspects.
5. Describe the role physical activity and sport specific training play on competitive athletic performance.

SPMD 2310. Career Preparation**1 Credit (1)**

From concept to implementation: Career exploration, setting up degree plans, finding graduate programs, developing professional resumes, writing letters of application, seeking letters of recommendation, and interview preparation.

Learning Outcomes

1. Career opportunities within human movement and allied health fields
2. Chose both a primary and secondary career of their interest
3. Search for appropriate graduate schools to match their career choices
4. Create a plan by aligning their undergraduate curriculum with their career choices
5. Explore additional education (dual majors, minors, and certifications specific to their chosen field)
6. Study and create a professional resume
7. Create a curriculum vita as a historical reference for future job prospects
8. Write a professional letter of application for jobs and school applications
9. Learn how to seek "outstanding" letters of recommendation
10. Study appropriate interview protocol
11. Practice interviews (one on one, panel and group)

SPMD 3010. Orthopedic Examination, Evaluation and Diagnosis of Lower Extremity Injuries**4 Credits (3+1P)**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatomy following athletic injury to the lower extremity. Must maintain at least 3.0 GPA. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the lower extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine and apply therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries.

SPMD 3050. Therapeutic Modalities**4 Credits (4)**

The physiological effects, indications, contraindication, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. May be repeated up to 4 credits. Must maintain 2.75 GPA.

Prerequisite: Consent of Instructor, SPMD 2210.

Learning Outcomes

1. Demonstrate proper assessment techniques to identify appropriate therapeutic modalities for the treatment of injury and illnesses.
2. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
3. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.
4. Perform appropriate documentation of treatments to include patient history, evaluation, treatment goals, expectations and treatment outcomes.
5. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.

SPMD 3090. Clinical Practicum III**3 Credits (3)**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Practice sessions are conducted to assist the student in achieving clinical proficiency skills.
2. Depending on the difficulty level, selected clinical proficiencies will be evaluated in this clinical.
3. For those proficiencies indicated, students will need to show proficiency either in this clinical or in a later clinical class.

SPMD 3093. Clinical Practicum IV**3 Credits (3)**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Identify and locate muscles, tendons, ligaments and bony structures.
2. Demonstrate basic evaluation skills, including but not limited to: taking a history, observation, differential diagnoses, palpation, ROM, neurological/circulation, MMT, special tests, clinical impression, plan.
3. Demonstrate taping, bracing skills, appropriate emergency care skills, select and properly fit athletic equipment, appropriate removal of athletic equipment in the event of an emergency, the ability to develop and answer a clinically relevant question.

SPMD 3110. Racquet Sports**2 Credits (2)**

Knowledge and skills related to the racquet sports of tennis, badminton, and pickleball with emphasis on developmental strategies and skill performance that influences pedagogical content knowledge. Administrative issues will be addressed.

SPMD 3120. Theory and Technique of Lifelong Outdoor Leisure Activities**2 Credits (2)**

Knowledge and skills related to lifelong outdoor leisure activities, including the examination of environmental science and awareness, kinesiology, and fundamental motor skills.

SPMD 3130. Theory and Technique of Sports and Games**2 Credits (2)**

Knowledge and skills related to team sports and games, with emphasis on developmental strategies and skill performance that influence pedagogical content knowledge. Administrative issues will also be addressed.

SPMD 3140. Designing Student Centered Afterschool Physical Activity Clubs**3 Credits (3)**

Knowledge, skills and field based practical application for creating student centered and student designed after school physical activity clubs.

SPMD 3150. Theory and Technique of Dance and Rhythms**2 Credits (2)**

Knowledge and skills related to dance and rhythms, with emphasis on the analysis of dance elements and its role in physical education.

SPMD 3160. Elementary School Physical Education**3 Credits (2+2P)**

Methods for teaching physical education at the elementary level. Primary focus on creating a learning environment for the acquisition and enhancement of developmentally appropriate locomotor, manipulative, and nonmanipulative skills. Field experience included. Consent of Instructor required.

Prerequisite: GPA of 2.5.

Learning Outcomes

1. All course objectives are linked to the InTASC Teaching Standards
2. Improve your knowledge of K-5 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person (Standard 4 j, k, l, n, o; Standard 5 i, Standard 6 j; Standard 7 g, k, l; Standard 8 l; Standard 9 o).
3. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences. (Standard 1 a, b, d, e, h, i; Standard 2 a, b, c, g, e; Standard 4 j, m, n, o; Standard 5 j, k; Standard 9 a, c, h, l)
4. Improve your ability to design and teach developmentally appropriate K-5 physical education curriculum for diverse learners. (Standard 1 a, b, d, e, h, j; Standard 2 a, b, c, d, f, g, h, j, k, l, m; Standard 4 b, c, d, e, f; Standard 5 b, d, h, r; Standard 7 a, b, c, d, e, g, h, j, k, l, n, q)
5. Improve your knowledge of, and ability to, teach a variety of manipulative, nonmanipulative and locomotor skills and concepts. (Standard 7 a, b, c, d, e, g, h, j, k, l, n, q; Standard 8 l)
6. Improve your ability to teach using a variety of strategies such as cooperative learning, problem-based learning, direct instruction, etc. that facilitate learning (Standard 8 a, b, d, e, f, h, l, j, k, l, m, n, s)

SPMD 3210. Anatomy and Physiology II**3 Credits (3)**

Detailed study of the structure and function of the human endocrine, immune, digestive, reproductive, integumentary, central nervous and renal systems. Designed specifically for students interested in allied health professions.

Prerequisite: SPMD 2210 or consent of instructor.

Learning Outcomes

1. Students will demonstrate knowledge through testing, practical skills and demonstration an understanding in visceral anatomy and physiological functioning.

SPMD 3210L. Anatomy and Physiology II Lab**1 Credit (1)**

The students will develop skills in palpating various bony landmarks as well as origins and insertions of major soft tissues. In addition, problem based learning scenarios will be used to complement the SPMD 3210 lecture material and thereby further students understanding of certain physiologic systems including neural, digestive, reproductive, endocrine, and integumentary.

Prerequisite: SPMD 2210; SPMD 2210L; or approved transfer equivalent.

Learning Outcomes

1. To demonstrate through practical application and demonstration a comprehensive understanding of visceral operations and diseases.

SPMD 3250. Introduction to Exercise Science: Exercise Physiology and Biomechanics**3 Credits (3)**

This course serves to provide a broad introduction to both the physiology of exercise and the mechanics of human movement. The conceptual framework of the course will allow for the development of a broad knowledge base regarding these concepts and the latter portions of the course will focus on real world application of the concepts.

Learning Outcomes

1. Students will learn a basic introduction to both exercise physiology and biomechanics and be able to demonstrate their knowledge of the introductory topics by providing real world examples.

SPMD 3310. Lifetime Activities**2 Credits (2)**

Knowledge and skills related to the lifetime activities of swimming, weight training, and other fitness promoting activities with emphasis on learning progressions.

Prerequisite: GPA 2.5.

Learning Outcomes

1. All course objectives are linked to the INTASC Teaching Standards
2. Improve your ability to design and teach developmentally appropriate fitness lesson plans for diverse learners (e.g. aerobics, yoga, strength training). (Standard 7 a, b, c, i, j Standard 8 a, b, d)
3. Improve your ability to modify instructions, lesson plans and tasks based on students' strengths and needs. (Standard 1 b, Standard 3 e, Standard 7 b, c, i, j, l, Standard 8 a, b, d)
4. Improve your knowledge of, and ability to teach a variety fitness content (Standard 7 a, g, h, k, l, n)
5. Improve your ability to plan effective lesson plans to insure equity and sensitivity to students with diverse characteristics. This includes structuring a safe, educational environment that facilitates learning for all students. (Standard 3, e, Standard 7 q, i)
6. Improve your ability to use self-assessment and peer-assessment to reflect on your teaching and plan for adaptations/adjustments (Standard 8 b, d, Standard 9 g).
7. Improve your ability to evaluate and modify instructional resources and curriculum to better meet the needs of their students. (Standard 4 f, Standard 7 g, Standard 8 a)

SPMD 3350. Inferential Statistics in Sport and Exercise Science**3 Credits (3)**

Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course

Learning Outcomes

1. Upon successful completion of this course the student will be able to competently assess exercise data using a variety of techniques that include measures of central tendency, variability, distributional assessments, correlation, regression, and mean testing (t-test and ANOVA).

SPMD 3410. Exercise Physiology**3 Credits (3)**

Basic physiological principles as they apply to exercise and fitness programs. Laboratory experiences included. Requires 2.75 GPA.

Prerequisite: SPMD 2210 or SPMD 2250; GPA 2.75.

Learning Outcomes

1. To gain knowledge of the structure and function of the body systems (muscle, cardiorespiratory, etc.).
2. To gain knowledge related to the body system in reference to acute bout of exercise (responses), as well as following chronic exposure to exercise (adaptions).
3. To understand laboratory procedures used to study the body system.
4. To be able to integrate knowledge related to the function of each system and apply this information to humans undergoing exercise training.

SPMD 3450. Biomechanics**3 Credits (3)**

The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement.

Prerequisite: SPMD 2210 and GPA of 2.75.

Learning Outcomes

1. Learn the basic anatomical, kinematic, and kinetic concepts
2. Learn how the human body generates mobility
3. Learn the kinematic concepts, laws, and principle that govern the human body motion
4. Learn the kinetic concepts laws, and principle that govern the human body motion
5. Learn the forces acting on the body in a fluid and how the human body motion is affected
6. Learn how to utilize the principles and concepts to solve problems

SPMD 3450L. Biomechanics Laboratory**1 Credit (1)**

This course serves to provide an introduction to human movement and its analysis. The conceptual framework of the course will allow for the application of anatomical, mechanical, and electrical concepts in order to better understand the fundamental nature of movement.

Prerequisite: SPMD 2210; GPA 2.75.

Learning Outcomes

1. Use physical laws of motion to quantitatively analyze human performance.
2. Use physical descriptors of movement to qualitatively analyze human performance.
3. Apply principles of kinetics kinematics to solve problems of human motion.
4. Gain exposure to the various data collection and analysis tools in biomechanics.
5. Apply critical thinking skills to problem solving and writing assignments.
6. Use teamwork to complete an experimental motion analysis projects.

SPMD 3550. Psychology of Sport**3 Credits (3)**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles.

Prerequisite: GPA 2.75.

Learning Outcomes

1. Identify psychological characteristics associated with peak performance
2. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
3. Recognize and define the psychological constructs of –for example but not limited to–concentration, confidence, motivation, stress/ anxiety, and arousal
4. Understand how personality attributes and the environment affect human performance and injury rehabilitation

SPMD 3610. Health and Exercise Psychology**3 Credits (3)**

The course examines the reciprocal relationship among physical activity, exercise behavior, and psychological determinants associated with adopting and maintaining an exercise program. Topics include theories of behavioral change, exercise psychology interventions, the benefits/pitfalls of exercise, and psychological factors influencing patient rehabilitation.

Prerequisite: GPA 2.75.

SPMD 3650. Motor Development**3 Credits (3)**

Covers development of motor skills from infancy through maturity. Focus on the principles of motor development, early motor behavior, stage theory, and assessment. Field experiences will augment lecture and readings.

Prerequisite: GPA 2.5.

SPMD 3710. Motor Learning**3 Credits (3)**

An examination of the theoretical foundations and related literature that underline the learning, performing, and retention of motor skills with implications for effective teaching and coaching.

Prerequisite: GPA 2.5.

Learning Outcomes

1. Assess functional differences between motor skill types
2. Compare motor control theories and how they control human movement.
3. Critically evaluate current research in motor learning
4. Assess practice schedules and provide recommendations on how practice might be improved in both therapy and sport settings.
5. Compare the pros and cons for retention and transfer testing.
6. Examine the influence of attention on skill performance and debate the role of attention on motor skill preparation

SPMD 4010. Orthopedic Examination, Evaluation and Diagnosis of Upper Extremity Injuries**4 Credits (3+1P)**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatomy following athletic injury to the upper extremity. Must maintain a 3.0 GPA. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the upper extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patients' overall health and quality of life.

SPMD 4015. Therapeutic Exercise**3 Credits (3)**

The physiological effects, indications, contraindications, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. Must maintain a 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Apply appropriate clinical reasoning to the selection of therapeutic exercises based upon evidence-based practice guidelines, relevant physical findings, indications, contradictions and precautions.
2. Demonstrate appropriate application of therapeutic exercises and techniques including selection, application, patient instruction, and documentation.
3. Design an individualized therapeutic exercise program incorporating appropriate modifications for tissue repair timelines, physiological and psychological factors, and any additional clinical findings.
4. Demonstrate effective assessment skills to determine safe levels of physical activity for patients.

SPMD 4020. Orthopedic Examination, Evaluation and Diagnosis of Core, Spine and Head Injuries**3 Credits (3)**

Advanced clinical assessment techniques and applications. Must maintain at least a 3.0 GPA. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Students will incorporate advanced clinical reasoning skills and apply clinical prediction rules as appropriate.
2. Interpret and apply physical examination findings for appropriate treatment or referral.
3. Apply clinical knowledge for diagnosing injuries and illness of the core, spine, head, and face.
4. Implement prevention guidelines associated with sudden death and catastrophic injury in athletics.

SPMD 4025. Pharmacology in Athletic Training**2 Credits (2)**

An introduction to general medical conditions and pharmacological applications in the athletic training setting. Emphasis on the laws governing the development and distribution, indications, contraindications, precautions, and interactions of prescription and over-the-counter medications. Must maintain a 3.0 GPA. May be repeated up to 2 credits.

Learning Outcomes

1. Describe the principles of pharmacology as they relate to the field of sports medicine.
2. Demonstrate the uses and abuses of drugs in sports.
3. Formulate a philosophical and ethical base of thinking in reference to the field of athletic training as it relates to pharmacology.
4. Describe federal, state and local laws, regulations and procedures for proper storage, disposal, transportation, dispensing and documentation for prescription and nonprescription medications.

**SPMD 4030. Organization and Administration in Athletic Training
3 Credits (3)**

An introduction to management, leadership, financial strategies, professional development and legal issues related to the athletic training setting. Must maintain 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate mastery of health care management concepts
2. Demonstrate comprehension of legal and ethical issue in Athletic Training and healthcare management.
3. Construct policies and procedures relevant to running an athletic training clinic or organization.
4. Demonstrate basic concepts of management including distribution of financial resources, inventory and athletic training facility design/evaluation.
5. Summarize appropriate human resources policies relevant to athletic training staffing.

**SPMD 4090. Clinical Practicum V
3 Credits (3)**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Utilize critical thinking skills and apply relevant clinical evidence in the evaluation, treatment and rehabilitation of athletic injuries of the upper extremity.
2. Perform a comprehensive evaluation of the upper extremity to include the shoulder, elbow, forearm, wrist and hand; and then design a specific plan of treatment, and rehabilitation program for injuries and conditions of the upper extremity.
3. Demonstrate an understanding of the referral process as warranted in situations dealing with athletic injuries.
4. Demonstrate an understanding of professional communication as it relates to rehabilitation, plan of care documentation and the referral process.
5. Demonstrate an understanding of the time commitment needed to perform as an ATC by completing the clinical hours required for this course.

**SPMD 4093. Clinical Practicum VI
3 Credits (3)**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students might complete a general medical rotation with this course. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Recognition of general medical conditions including emergent physical and psychological conditions for intervention, referral or return to play criteria as appropriate.
2. Demonstrate proper clinical examination techniques for the assessment of general medical conditions including signs and symptoms of catastrophic and emergent conditions.
3. Develop and implement prevention strategies for at-risk individuals and large groups.
4. Demonstrate professional communication skills as related to athletic training including both written and verbal communication.
5. Define and utilize evidence-based practice in the clinical decision making process.

**SPMD 4095. Clinical Practicum VII
3 Credits (3)**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students may complete a general medical rotation as part of this course. Must maintain 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Be prepared to sit for the Board of Certification (BOC) examination.
2. Confidently understand the BOC exam format, and method of delivery.
3. Meet the requirements to maintain certification, including evidence based practice requirements and continuing education units and their reporting cycles.
4. Demonstrate competence in the following educational content areas for the practice of Athletic Training: evidence-based practice, prevention and health promotion, clinical examination and diagnosis, acute care of injury and illness, therapeutic interventions, psychosocial strategies and referral, healthcare administration, professional development and responsibility.

**SPMD 4098. Advanced Athletic Training I
1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainer's Association Education Council. May be repeated up to 9 credits.

Learning Outcomes

1. Describe an advanced clinical setting.
2. Demonstrate advanced clinical reasoning skills.
3. Demonstrate advanced clinical competence in one or more of the domains as described by the National Athletic Trainers Association Education Council.

SPMD 4210. Advanced Exercise Physiology**3 Credits (3)**

Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences.

Prerequisite: SPMD 3410 and GPA of 2.75 or consent of instructor.

Learning Outcomes

1. Fundamental concepts about nutrition and its application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 4250. Principles of Strength and Conditioning**3 Credits (3)**

Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. Requires SPMD 2250 or SPMD 3410; GPA of 2.75.

Prerequisite: SPMD 2250 or SPMD 3410; GPA 2.75.

Learning Outcomes

1. Examine both applied and theoretical practices implemented towards various strength and conditioning concepts based on National Strength and Conditioning Association (NSCA) guidelines.
2. Discuss various acute and chronic adaptations to the above said applied and theoretical practices to include, but not limited to, musculoskeletal adaptation, muscular power output, speed and agility characteristics, plyometric training, body composition characteristics, and cardiovascular characteristics, among many others.
3. Recognize strength and conditioning adaptations regarding special populations, such as youth, female, and elderly populations.

SPMD 4250L. Principles of Strength and Conditioning Laboratory**1 Credit (2P)**

An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors. GPA of 2.75.

Prerequisite: SPMD 2250 or SPMD 3410; GPA 2.75.

Learning Outcomes

1. Examine applied practices towards various human performance concepts based on National Strength and Conditioning Association (NSCA) guidelines.
2. Assess various physiological adaptations to the above applied practices, including muscular hypertrophy, muscular power output, speed and agility drills, plyometric training, body composition assessment, and non-traditional training modes, among numerous others.
3. Demonstrate proficiency towards proper administration of performance assessments and exercises to participants of various skill levels as well as possess the capability of instruction and demonstration of said assessments and exercises

SPMD 4350. Exercise Testing and Prescription**3 Credits (3)**

This combined lecture and lab class introduces students to the scientific basis for and principles of exercise testing and prescription. The focus is on basic approaches to exercise testing and prescription for healthy adults, while application to some special populations with chronic disease will be discussed.

Prerequisite: SPMD 3410 or consent of instructor; GPA 2.75.

Learning Outcomes

1. Examine the appropriate administration of exercise tests for the assessment of health-related and performance-related fitness.
2. Apply principles pertaining to appropriate exercise prescription for the general population of healthy adults.
3. Analyze the psychological determinants of appropriate exercise programming.
4. Demonstrate the ability of proper diagnosis and interpretation towards a standard 12-lead ECG reading, including heart rates, heart rhythms, and common arrhythmias.
5. Assist every course participant in the preparation processes to sit for any of ACSM's credential-based exams.

SPMD 4410. Exercise for Special Populations**3 Credits (3)**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions.

Prerequisite: SPMD 3410 or consent of instructor; GPA of 2.75.

Learning Outcomes

1. Pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. Diagnostic testing of various diseases.
3. Medical management of various diseases.
4. Exercise testing and prescription for a variety of chronic disease states

SPMD 4450. Pathophysiology and Human Function(s)**3 Credits (3)**

Students will discuss basic concepts of pathophysiology such as inflammation & repair, infectious diseases, neoplasms, and diseases of specific physiological systems. In addition, students will discuss a variety of case studies, and in so doing will be able to relate pathophysiologic conditions to symptoms, activity restrictions and disability.

Prerequisite: SPMD 2210; SPMD 2210L; SPMD 3410; GPA 2.75.

SPMD 4510. Neurophysiology and Human Function**3 Credits (3)**

Students will discuss neurological control of human movement. Topics will include central and peripheral nervous system functions, with particular emphasis given to somatosensory afferent and motor efferent control. In addition, students will develop an understanding of the techniques employed to assess neurologic function in various patient populations.

Prerequisite: SPMD 2210; SPMD 2210L; SPMD 3410; and GPA of 2.75.

SPMD 4520. Adapted Physical Education**3 Credits (3)**

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student.

Learning Outcomes

1. Students will learn to implement principles of inclusion into the practice of physical education.

SPMD 4530. Methods of Teaching Secondary Physical Education**6 Credits (6)**

Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of Instructor required.

Prerequisite: SPMD 3160.

Learning Outcomes

1. Improve your knowledge of 6-12 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person
2. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences
3. Improve your ability to design and teach developmentally appropriate 6-12 physical education curriculum for diverse learners

SPMD 4550. Exploring Extreme Human Performance**3 Credits (3)**

A reading, writing and documentary based course studying human's quest and the related sacrifices associated with participating in extreme performance activities such as the Olympics, wakeboarding, snowboarding, military special forces, ultra-run events, marathons, etc. Consent of Instructor required.

Prerequisite: Consent of instructor and GPA 2.75.

SPMD 4610. Research Seminar**3 Credits (3P)**

Capstone course for Kinesiology/Pre-Health minors. Consent of Instructor required.

Prerequisite: GPA 2.75.

Learning Outcomes

1. The Student Learning Outcomes are dependent on instructor and specific direction of course with individual group of students, similar to an independent study/research/practicum experience

SPMD 4805. Emergency Response**2 Credits (2)**

Comprehensive approach to the identification of risk factors, preparation of emergency action plans, and recognition and care of emergency medical conditions including those that may lead to sudden death. This is a hybrid course combining online instructional components and clinical skills experience including clinical safety (blood-borne pathogens, ECC, first-aid, etc), and on-field emergency management. Consent of Instructor required.

Learning Outcomes

1. Identify the individuals involved in the Emergency Response Team
2. Construct the components of an effective Emergency Action Plan.
3. Assess the scene and patient during an emergency situation.
4. Demonstrate proper universal precautions and wound care.
5. Demonstrate effective Cardiopulmonary Resuscitation, AED use.
6. Demonstrate effective Rescue Breathing Airway Management techniques.
7. Demonstrate effective splinting techniques.
8. Demonstrate understanding of the techniques utilized in cervical stabilization
9. Identify components of acute care for general medical and orthopedic emergencies

SPMD 4997. Problems**1-3 Credits (1-3)**

Independent study in either Kinesiology and/or Athletic Training May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPMD 4998. Internship**6 Credits (6P)**

A part-time internship in an approved wellness, fitness, athletic, recreation, research lab or other program as agreed upon by the internship supervisor. The student will gain experience in all phases of management and operation. This is a 6-hour internship which can be repeated for an additional 6-credit hours at the same or a different location allowing the student to gain one or multiple field experiences. Field instructor supervision will oversee the students performance. This internship may require relocation to a site outside of the Las Cruces area.

Learning Outcomes

1. Students will apply their academic program didactic knowledge, skills and abilities at a professional site gaining hands-on learning experiences under the supervision of a practicing professional
2. Students will learn in a working environment such that the internship becomes the capstone of their undergraduate education allowing them practical experience in a career field of their choice.

SPMD 5005. Foundations of Athletic Training**3 Credits (3)**

This course provides an introduction to clinical decision making and covers standard techniques and procedures for the evaluation and diagnosis of musculoskeletal injuries and common illnesses, injury prevention concepts, documentation and management. Consent of Instructor required.

Learning Outcomes

1. Demonstration of clinical decision making skills
2. Articulation of standard techniques and procedures for evaluation and diagnosis
3. Produce standardized documentation of clinical findings.

SPMD 5010. Clinical & Functional Anatomy in Athletic Training**2 Credits (2)**

This course allows students to develop applied knowledge and hands-on skills for future athletic training practitioners. Emphasizes skills for identifying musculoskeletal structures visually and via palpation, and then assessing their function. Use of anatomical and live human models to develop and demonstrate skills. Acceptance into the MSAT program.

Learning Outcomes

1. Demonstrate knowledge of human musculoskeletal structures and function.
2. Identification of bony landmarks for assessment of musculoskeletal conditions.
3. Demonstrate appropriate palpation of muscles, bones and joints for musculoskeletal assessment.
4. Demonstrate knowledge of actions, origins, insertions and innervations of the major muscle groups of the human body.
5. Demonstrate appropriate techniques for assessment of functional movements.

SPMD 5015. Graduate Athletic Training Seminar II**1-3 Credits (1-3)**

Advanced seminar topics in athletic training. Students will explore more specialized topics within the field of athletic training under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program. Students should be prepared to further explore topics previously covered in SPMD 5310 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas. Students may explore athletic training topics within the classroom or independently through designated resources. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5020. Graduate Athletic Training Research I**1-3 Credits (1-3)**

Advanced research topics in athletic training. Students will explore research and evidence based practices within the field of athletic training. Students will work under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program faculty member. Students should be prepared to further explore research topics within a specific discipline with the intent of disseminating and sharing information with the athletic training community. topics previously covered in SPMD 5310 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in assessing and conducting research for the athletic training community

SPMD 5025. Graduate Athletic Training I**1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Students will examine topics in athletic training in conjunction with faculty members within the Commission on the Accreditation of Athletic Training Education (CAATE) Athletic Training Program at New Mexico State University . Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5030. Graduate Athletic Training II**3 Credits (3)**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5050. Clinical Education I**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice. Consent of Instructor required.

Learning Outcomes

1. Demonstrate basic evaluation, taping, bracing and emergency care skills.
2. Select and properly fit protective equipment for a variety of injury and sport scenarios.
3. Demonstrate proper equipment removal for emergency care of the injured athlete.
4. Perform a pre-participation examination including physical evaluation, documentation and referral if needed.

SPMD 5120. Lower Extremity Injury Evaluation + Lab**4 Credits (4)**

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the lower extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the lower extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine and apply therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries.

SPMD 5150. Clinical Education II**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 5050.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 5180. Therapeutic Interventions I**4 Credits (3+1P)**

Stud of physical rehabilitation theory and techniques used as therapeutic intervention for orthopedic injuries and conditions.

Learning Outcomes

1. Demonstrate appropriate application techniques for therapeutic modalities to include thermal, electrical, ultrasound and mechanical therapeutic modalities.
2. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
3. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.

SPMD 5205. Evidence Based Practice**2 Credits (2)**

This course investigates the concepts of evidence based practice as it relates to musculoskeletal assessment, diagnosis and therapeutic interventions with a primary focus on clinician- and patient-oriented outcome measures and appropriate referral decisions. Students will explore primary literature focused on clinical questions related to a comprehensive approach to injury evaluation.

Learning Outcomes

1. Define evidence-based practice as it relates to athletic training clinical practice.
2. Explain the role of evidence in the clinical decision-making process.
3. Describe and differentiate the types of quantitative and qualitative research, research components, and levels of research evidence.
4. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
5. Develop a relevant clinical question using a pre-defined question format (eg, PICO= Patients, Intervention, Comparison, Outcomes; PIO = Patients, Intervention, Outcomes).

SPMD 5220. Upper Extremity Injury Evaluation + Lab**4 Credits (3+1P)**

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the upper extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the upper extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patient's overall health and quality of life.

SPMD 5250. Immersive Clinical Experience**3 Credits (3P)**

Integration of clinical competencies during an immersive, supervised, field based experience in athletic training to link theory into practice. May be repeated up to 6 credits.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will be proficient in the day to day operations of an athletic training room.
2. This immersive experience will prepare students for future employment as a full-time athletic trainers.
3. Students will demonstrate skills in all aspects of athletic training including patient-centered care, clinical examination, diagnosis and intervention, prevention, health promotion and wellness and healthcare administration.

SPMD 5280. Therapeutic Interventions II**4 Credits (3+1P)**

A detailed study of the physiological effects, indications, contraindication, dosage, and maintenance of modern therapeutic devices related to the treatment and rehabilitation of orthopedic injuries and conditions.

Prerequisite: SPMD 5180.

Learning Outcomes

1. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
2. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.
3. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
4. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.
5. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.

SPMD 5310. Inferential Statistics in Sports and Exercise Science**3 Credits (3)**

This course serves to provide an introduction to statistical analyses. The conceptual framework of the course will allow for the application of a variety of statistical concepts in order to better understand the nature of data associated with scientific literature publications. Consent of Instructor

Learning Outcomes

1. Upon successful completion of this course the student will be able to competently assess exercise data using a variety of techniques that include measures of central tendency, variability, distributional assessments, correlation, regression, and mean testing (t-test and ANOVA).

SPMD 5350. Principles of Strength and Conditioning**3 Credits (3)**

Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Consent of Instructor

Learning Outcomes

1. Understanding of general physiology and its responses to acute and chronic exercise
2. Understanding of cardiovascular effects of exercise, training and sport
3. Understanding of strength training affects on special populations such as youth, women and the elderly
4. Understanding of musculoskeletal changes from exercise, training and sport
5. Practicality and application of power and strength training
6. Comprehension of training programs and how they pertain to different training aspects
7. Demonstrate principles of plyometrics and training
8. Understand and demonstrate principles of periodization

SPMD 5410. Biomechanics**3 Credits (3)**

The application biomechanical analysis of human movement as it relates to human performance through the use of anatomical, mechanical and electrical concepts. Consent of Instructor

Learning Outcomes

1. The student will be able to competently assess physical anatomy, analyze linear and angular forces, examine gait, understand the relationships between kinetics and kinematics, understand how muscle and bone architecture impact human movement, and be familiar with the utilization of various data collection methods used in evaluating and improving human movement.

SPMD 5450. Exercise for Special Populations**3 Credits (3)**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Consent of Instructor

Learning Outcomes

1. To develop an understanding of the pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. To provide a medical perspective in the treatment and management of individuals with these conditions in which exercise therapy may be beneficial.
3. To provide a sound understanding of exercise testing and prescription for a variety of chronic disease states.
4. To be able to assess, interpret, and evaluate case studies of diseased individuals and to develop comprehensive rehabilitation programs based on this information.
5. To develop the ability to articulate / present information of various diseases / conditions in a professional manner both formally and in a one on one setting.

SPMD 5510. Psychology of Sport**3 Credits (3)**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles. Consent of Instructor

Learning Outcomes

1. Identify psychological characteristics associated with peak performance
2. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
3. Recognize and define the psychological constructs of –for example but not limited to–concentration, confidence, motivation, stress/anxiety, and arousal.
4. Understand how personality attributes and the environment affect human performance and injury rehabilitation.

SPMD 5550. Skill Acquisition and Performance**3 Credits (3)**

Behavioral and physiological examination factors that influence the acquisition and performance of motor skills. Consent of Instructor

Learning Outcomes

1. Describe and explain the principles and processes underlying skilled performance
2. Know the factors to consider when diagnosing, designing, and assessing learning experiences
3. Understand the elements of an effective instructional plan for skill acquisition

SPMD 5575. Advanced Motor Development**3 Credits (3)**

Advanced coverage of motor development topics including: Theoretical perspectives of motor development; the sequential, age-related, continuous process of physical growth and maturation; changes in movement behavior from infancy to older adulthood; external influences on development of motor skills; research approaches in motor development. Consent of Instructor

Learning Outcomes

1. Describe the historical progression of motor development within the broader field of kinesiology
2. Explain the various theories and foundational concepts of motor development
3. Understand and apply the processes (social, cognitive, perceptual) involved in motor skill development throughout the lifespan (infancy, childhood, adolescence, adulthood)
4. Identify procedures and methodologies used to assess various aspects of motor development
5. Interpret the supporting literature and research related to the fundamental principles of motor development
6. Apply and transfer the knowledge gained to develop a research proposal to enhance understanding of a motor development topic of interest

SPMD 6005. Athletic Training Research I**2 Credits (2)**

Instruction and development of research skills through the study of published reports and readings in athletic training and related fields. Consent of Instructor required.

Learning Outcomes

1. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
2. Develop skill in utilizing multiple scales for critical appraisal of literature and research studies.
3. Develop a relevant clinical question utilizing a predefined question format and conduct a literature review on the subject.
4. Describe multiple forms of research, research and literature resources and the differences between narrative reviews, systematic reviews and meta analyses.
5. Describe and apply concepts of diagnostic accuracy and clinical prediction rules as they pertain to patient centered care and evidence based practice.

SPMD 6010. Organization and Administration in Athletic Training**2 Credits (2)**

Organization and administration of athletic training services including management, leadership, financial, human resources, facility, information technology and risk management.

Learning Outcomes

1. Students will employ values consistent with the NATA code of ethics for all health care administration actions.
2. Demonstrate knowledge of legal, ethical and risk management concepts in athletic training and health care administration.
3. Demonstrate mastery of a variety of health care management concepts.
4. Demonstrate comprehension of fiscal management strategies, resource management and facility design as it relates to athletic training.

SPMD 6020. Evaluation of the Head, Neck, Spine and Torso**3 Credits (3)**

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the head, neck and spine.

Prerequisite: SPMD 5220.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the head, neck, spine and torso.
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries and illnesses.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patients' overall health and quality of life.

SPMD 6050. Clinical Education III**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 6110. Professional Preparation**3 Credits (3)**

Knowledge and skills for successful pursuit of athletic training credentials, employment and continuing professional competency; emphasis on current topics and issues contributing to the professional preparation of athletic training. Student must be enrolled in their final semester of the MSAT program to enroll in this course.

Learning Outcomes

1. Students will create a profile with the Board of Certification (BOC) in preparation for their BOC Examination
2. Students will analyze their individual strengths and weaknesses through practice examinations in order to prepare for a successful challenge of the BOC Examination
3. Students will demonstrate knowledge of basic human resources policies and procedures and the hiring process for athletic trainers.
4. Students will self-assess professional competence and create professional development plans according to personal and professional goals and requirements

SPMD 6150. Clinical Education IV**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 6050.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.
3. Students will demonstrate professional behaviors congruent with the ethical standards of the profession of athletic training.
4. Students will develop, implement, and revise policies that pertain to prevention, preparedness, and response to medical emergencies and other critical incidents.

SPMD 6280. General Medical Conditions & Therapeutic Medications**4 Credits (3+1P)**

Pathophysiology, assessment, and appropriate intervention and referral for general medical conditions and disabilities; common diagnostic tests and imaging assessment tools; commonly used therapeutic medications.

Prerequisite: SPMD 5280.

Learning Outcomes

1. Recognition of general medical conditions including emergent physical and psychological conditions for intervention, referral or return to play criteria as appropriate.
2. Demonstrate proper clinical examination techniques for the assessment of general medical conditions including signs and symptoms of catastrophic and emergent conditions.
3. Demonstrate knowledge of common therapeutic medications and the general medical conditions they treat within the fields of athletic training and sports medicine.
4. Demonstrate knowledge of the principles of pharmacology, including pharmacokinetics and pharmacodynamics, as they relate to the fields of athletic training and sports medicine.
5. Demonstrate knowledge of federal, state and local laws, regulations and procedures for proper storage, disposal, transportation, dispensing and documentation dealing with prescription and non-prescription medications.

SPMD 6310. The Social Construction of the Body**3 Credits (3)**

This course will explore how people's health and physical activity experiences and choices are often shaped by cultural narratives and expectations of the male and female body. Designed for graduate students in allied health and physical activity professions

SPMD 6350. Advanced Exercise Physiology**3 Credits (3)**

Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Consent of Instructor

Learning Outcomes

1. Fundamental concepts about nutrition and its application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 6410. Cardiovascular Physiology
3 Credits (3)

This graduate level course provides an in-depth study of cardiovascular structure and function. The course assumes that students have a strong background in human physiology. Topics include, but are not limited to: cellular structure of the heart and vascular system; cardiac function, including electrophysiology of the heart; vascular function; neurohumoral control of the heart and circulation, organ blood flow, exchange function of the microcirculation; the impact of common cardiovascular diseases on cardiovascular structure and function, and cardiovascular adaptations to chronic exercise. Consent of Instructor

Learning Outcomes

1. The student will demonstrate a comprehensive knowledge cardiovascular structure and function
2. The student will be able to relate common cardiovascular pathophysiology to cardiovascular functional impairments and physical functional limitations.
3. The student will be able to discuss chronic exercise training adaptations on the cardiovascular system and their value as a treatment strategy for cardiovascular diseases.

SPMD 6450. Skeletal Muscle: Structure and Function
3 Credits (3)

Basic muscle morphology and physiology with molecular and cellular adaptations in skeletal muscle as consequences to varying exercise regimens. Consent of Instructor

Learning Outcomes

1. To gain knowledge of the structure and function of skeletal muscle
2. To gain knowledge related to the skeletal muscle in reference to cellular and molecular responses and adaptations to exercise
3. To understand laboratory procedures used to study muscle metabolism
4. To develop ability to scientifically critique published papers and present them in a professional manner

SPMD 6510. Designing Resistance Training Program
3 Credits (3)

Detailed study of the physiological concepts associated with designing resistance-training programs for children, women, seniors, athletic performance and rehabilitation. Consent of Instructor

Learning Outcomes

1. Fundamental components associated with resistance training and exercise prescription
2. Compare and contrast isometric, dynamic, variable, isokinetic, eccentric, concentric resistance training
3. Design programs guided by a needs analysis
4. Demonstrate appropriate techniques and implement systems for training
5. Study physiological adaptations of resistance training for women, children, seniors, athletics and rehabilitation
6. Understand anatomical and physiological changes associated with detraining
7. Integrate components and concepts of resistance training for program design (periodization)
8. Explore alternative training programs

SPMD 6710. Project
1-12 Credits (1-12)

Selected projects for doctoral students. May be repeated up to 12 credits.

SPMD 6750. Kinesiology Research
1-3 Credits (1-3)

Research to be conducted under the direction of a Kinesiology faculty member May be repeated up to 15 credits.

SPMD 6996. Special Topics
1-3 Credits (1-3)

Offered under various subtitles that indicate the subject matter. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPMD 6999. Capstone Project I
3 Credits (3)

Students will prepare an individualized capstone project

Prerequisite: SPMD 5205.

Learning Outcomes

1. Varies

SPMD 7000. Doctoral Dissertation
1-18 Credits (1-18)

Doctoral Dissertation hours to be conducted under the direction of a Kinesiology Faculty. May be repeated up to 18 credits.

Learning Outcomes

1. Varies

Interim Department Head: Christopher A. Aiken

Department Secretary and Administrative Assistant: Maggie Karveller

Office Location: Activity Center Room 204

Phone: (575) 646-2215

Website: <https://kind.nmsu.edu/>

Dance (Contemporary Dance) - Bachelor of Arts in Dance

The Bachelor of Arts in Dance offers a broad technical, artistic, and academic curriculum designed to provide a well-rounded and comprehensive experience in technique, composition, pedagogy, performance, and interdisciplinary study.

Students must complete all University degree requirements, including General Education and Viewing the Wider World coursework and Dance Technique, Dance Technique Electives, Dance Major Core Requirements, and Interdisciplinary Electives.

Grades of C- or better are required in Area I: ENGL 1110G Composition I and Area II: Mathematics, as well as Dance Major Core Courses. The College of Health, Education and Social Transformation requires a minimum GPA of 2.5 for graduation. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Students must complete a minimum of 120 credits with 48 credits in courses numbered 3000 (300) or above.

Prefix	Title	Credits
General Education Requirements ¹		
Students may take any general education course under each area as listed in the undergraduate course catalog.		
Area I: Communications ¹		10

English Composition - Level 1	
ENGL 1110G Composition I	
English Composition - Level 2 ¹	
Oral Communication ¹	
<i>Area II: Mathematics^{1,2}</i>	3-4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences¹</i>	10-11
Area III: Laboratory Science ¹	
Area IV: Social/Behavioral Science ¹	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course ¹	
<i>Area V: Humanities¹</i>	3
<i>Area VI: Creative and Fine Arts¹</i>	3
<i>General Education Elective (Must have a "G" distinction)¹</i>	3-4
Viewing the Wider World³	6
Dance Technique Requirements	
<i>Ballet Technique</i>	
Four semesters of Ballet Technique from	7-8
Ballet Technique courses can be taken for repeatable credit to meet the 7-8 credit requirement	
DANC 1130 Ballet I	
DANC 2130 Ballet II	
DANC 3130 Ballet III	
<i>Modern Dance Technique</i>	
Four semesters of Modern Dance Technique from:	7-8
Modern Dance Technique courses can be taken for repeatable credit to meet the 7-8 credit requirement	
DANC 1150 Modern Dance I	
DANC 2150 Modern Dance II	
DANC 3150 Modern Dance III	
Dance Technique Electives	
Choose three of the following:	4-6
DANC 1160 Jazz Dance I	
DANC 1161 Tap Dance I	
DANC 2157 Hip-Hop Dance	
DANC 2160 Jazz Dance II	
DANC 2161 Tap Dance II	
DANC 2460 Dance for Musical Theatre	
Choose two of the following:	2
DANC 1131 Introduction to Ballroom Dance	
DANC 1140 Flamenco I	
DANC 1220 Introduction to Latin Social Dance	
Choose one of the following:	1
PHED 1410 Yoga:	
PHED 1430 Pilates:	
At least two additional elective semesters of any course in Dance Technique	4
Dance Major Core Requirements	36
DANC 2270 Dance Improvisation	
DANC 3250 Contemporary Dance Ensemble (Course must be taken 4 times)	
Students may substitute DANC 3114 for up to 2 credits towards the DANC 3250 4 credit requirement	
DANC 3265 Principles of Choreography I	
DANC 3510V World Dance	
DANC 3350 Dance Pedagogy I	
DANC 3610 Dance History	
DANC 3710 Somatics and Anatomy of Movement	

or SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory
DANC 3720	Dance, Technology, and Design
DANC 4996	Special Topics
DANC 4265	Principles of Choreography II
DANC 4250	Dance Pedagogy II
DANC 4710	Senior Project
Interdisciplinary Elective Requirements	
Choose three from the following:	
THEA 1110G	Introduction to Theatre
THEA 1210G	Acting for Non-Majors
THEA 334	Introduction to Stage Makeup
THEA 352	Costume Design
THEA 355	Lighting Design
Choose four from the following:	
Advanced Independent Project in Dance is repeatable for credit and may satisfy this requirement only if the topic proposed is Interdisciplinary in nature.	
ARTH 2120G	History of Art II
ARTS 1145G	Visual Concepts
BUSA 1110	Intro to Business
DANC 4266	Advanced Independent Projects
ECED 1110	Child Growth, Development, and Learning
EDUC 1120	Introduction to Education
ENTR 1110	Entrepreneurship
MGMT 310V	Entrepreneurial Mindset
MUSC 1210	Fundamentals of Music for Non-majors
SPMD 1310	Introduction to Kinesiology
SPMD 1350	Social Foundations of Physical Activity
Interdisciplinary Electives should bring total hours up to 120 ⁴	
A course designated G or V cannot be used to satisfy both major and General Education requirements	
Students taking a minor in a related or complementary discipline may request substitution of elective courses from their Dance Program faculty advisor. Students interested in Teacher Licensure are recommended to take a minor in Education	
Electives to bring the total credits to 120	
Total Credits	
120-127	

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² A Mathematics General Education course is required for the degree, but students may need to take any prerequisites needed to enter the Mathematics course of their course.

³ See the Viewing the Wider World (p. 224) Section of the catalog for a full list of courses

⁴ Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students - Even Start Year

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and

order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Additional courses to bring total hours up to 120 may be taken in any semester.

First Year		
Fall		Credits
Ballet or Modern Dance Technique Course		1-2
PHED 1430	Pilates: or PHED 1410 or Yoga:	1
Dance Technique Elective Course		1-2
ENGL 1110G	Composition I	4
General Education or Viewing the Wider World Course ^{1,2}		3-4
Interdisciplinary Electives Course		3
Credits		13-16
Spring		
Ballet or Modern Dance Technique Course		1-2
Dance Technique Electives Course		2-3
DANC 3250	Contemporary Dance Ensemble	1
THEA Elective Course		3
General Education or Viewing the Wider World Course(s) (two in total) ^{1,2}		6-8
Credits		13-17
Second Year		
Fall		
Ballet or Modern Dance Technique Course		2
Dance Technique Electives Course		2-3
DANC 3710	Somatics and Anatomy of Movement	3
DANC 3250	Contemporary Dance Ensemble	1
THEA Elective Course		3
General Education or Viewing the Wider World Course (two in total) ^{1,2}		6-7
Credits		17-19
Spring		
Ballet or Modern Dance Technique Course		2
Dance Technique Elective Course		1-2
DANC 2270	Dance Improvisation	2
DANC 3250	Contemporary Dance Ensemble	1
DANC 3510V	World Dance	3
Interdisciplinary Elective Course		3
General Education or Viewing the Wider World Course ^{1,2}		3-4
Credits		15-17
Third Year		
Fall		
Ballet or Modern Dance Technique Course		2
DANC 3265	Principles of Choreography I	3
DANC 3610	Dance History	3
DANC 3250	Contemporary Dance Ensemble	1
General Education Course(s) - two in total ¹		6
Credits		15
Spring		
Ballet or Modern Dance Technique Course		2
Dance Technique Elective Course		2
DANC 3350	Dance Pedagogy I	3
DANC 3720	Dance, Technology, and Design	3

General Education Course(s) - two in total ¹		6-7
Credits		16-17
Fourth Year		
Fall		
Ballet or Modern Dance Technique Course		2
Dance Technique Elective Course		1-2
DANC 4265	Principles of Choreography II	3
DANC 4996	Special Topics	3
Interdisciplinary Elective Course		3
General Education or Viewing the Wider World Course ^{1,2}		3
Credits		15-16
Spring		
Ballet or Modern Dance Technique Course		2
Dance Technique Electives Course		2
DANC 4250	Dance Pedagogy II	3
THEA Elective Course		3
DANC 4710	Senior Project	3
Interdisciplinary Elective Course		3
Credits		16
Total Credits		120-133

A Suggested Plan of Study for Students - Odd Start Year

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Additional courses to bring total hours up to 120 may be taken in any semester.

First Year		
Fall		Credits
Ballet or Modern Dance Technique Course		1-2
PHED 1430	Pilates: or PHED 1410 or Yoga:	1
Dance Technique Electives Course		1
Interdisciplinary Elective Course		3
ENGL 1110G	Composition I	4
General Education or Viewing the Wider World Course		3-4
Credits		13-15
Spring		
Ballet or Modern Dance Technique Course		1-2
Dance Technique Elective Course		2
DANC 2270	Dance Improvisation	2
DANC 3250	Contemporary Dance Ensemble	1
THEA Elective Course		3
General Education or Viewing the Wider World Course(s) - two in total		6-8
Credits		15-18
Second Year		
Fall		
Ballet or Modern Dance Technique Course		2
Dance Technique Electives Course		2
DANC 3265	Principles of Choreography I	3
DANC 3250	Contemporary Dance Ensemble	1
General Education or Viewing the Wider World Course(s) - two in total		6-8

Interdisciplinary Elective Course	3
Credits	17-19
Spring	
Ballet or Modern Dance Technique Course	2
Dance Technique Electives Course	1-2
DANC 3350 Dance Pedagogy I	3
DANC 3250 Contemporary Dance Ensemble	1
General Education or Viewing the Wider World Course(s) - two in total	6-8
Credits	13-16
Third Year	
Fall	
Ballet or Modern Dance Technique Course	2
DANC 3710 Somatics and Anatomy of Movement	3
DANC 4265 Principles of Choreography II	3
DANC 3250 Contemporary Dance Ensemble	1
General Education or Viewing the Wider World Course(s) - two in total	6-8
Credits	15-17
Spring	
Ballet or Modern Dance Technique Course	2
Dance Technique Elective Course	1-2
DANC 4250 Dance Pedagogy II	3
DANC 3510V World Dance	3
THEA Elective Course	3
General Education or Viewing the Wider World Course	3
Credits	15-16
Fourth Year	
Fall	
Ballet or Modern Dance Technique Course	2
Dance Technique Elective Course	2
DANC 3610 Dance History	3
DANC 4996 Special Topics	3
Interdisciplinary Elective Course	3
General Education or Viewing the Wider World Course	3
Credits	16
Spring	
Ballet or Modern Dance Technique Course	2
Dance Technique Elective Course(s) - two in total	2-4
DANC 3720 Dance, Technology, and Design	3
THEA Elective Course	3
DANC 4710 Senior Project	3
Interdisciplinary Elective Course	3
Credits	16-18
Total Credits	120-135

Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology

Kinesiology is a great option and prepares students for many field in allied health. Career choices include, but are not limited to, medical school, physical and occupational therapy, athletic training, corporate health and wellness, chiropractic medicine, dentistry, optometry, pharmacy, and much more.

The Bachelor of Science in Kinesiology degree program can be completed in one of three concentration areas: Exercise Science, Performance Psychology, or Physical Education. For the required credit hours see the program descriptions below. Regardless of the concentration, students

are required to complete 120 total semester hours for the Kinesiology degree. Additionally, students pursuing a Kinesiology degree will be responsible to ensure that they complete 48 upper division credits (3000 (300) and 4000 (400) level courses). Kinesiology students must maintain a minimum 2.75 GPA in order to enroll in most upper division SPMD courses. ENGL 1110G, Area II General Education courses, Kinesiology courses, and Approved Electives must be completed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education, Viewing a Wider World, and program specific courses to total a minimum of 120 credits. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Information about Kinesiology and potential career opportunities may be obtained at the Department of Kinesiology, Activity Center 204, phone 575-646-2215.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
<i>English Composition - Level 2 ¹</i>		
Choose one from the following: (ENGL 2210G or ENGL 2215G recommended)		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication ¹</i>		3
<i>Area II: Mathematics</i>		3-4
Choose one of the following:		
MATH 1220G	College Algebra	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Area III: Laboratory Science Courses (8 credits total)		
Choose two from the following of the following (8 credits total): (BIOL 2110G/L recommended)		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	

PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences Course (3 credits)		
PSYC 1110G	Introduction to Psychology	
Area V: Humanities ¹		3
Area VI: Creative and Fine Arts ¹		3
General Education Elective ¹		3-4
Viewing a Wider World ⁴		6
Departmental/College Requirements		
Chose three of the following:		3
PHED 1230	Individual Sport:	
PHED 1290	Team Sport:	
PHED 1310	Swim I:	
PHED 1410	Yoga:	
PHED 1430	Pilates:	
PHED 1510	Training:	
PHED 1620	Fitness:	
PHED 1670	Aerobics:	
PHED 1830	Running:	
SPMD 1310	Introduction to Kinesiology	3
SPMD 1350	Social Foundations of Physical Activity	3
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
SPMD 3210	Anatomy and Physiology II	3
SPMD 3210L	Anatomy and Physiology II Lab	1
SPMD 3410	Exercise Physiology	3
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
or SPMD 3610	Health and Exercise Psychology	
SPMD 3650	Motor Development	3
SPMD 3710	Motor Learning	3
SPMD 4250	Principles of Strength and Conditioning	3
SPMD 4250L	Principles of Strength and Conditioning Laboratory	1
SPMD 4350	Exercise Testing and Prescription	3
SPMD 4410	Exercise for Special Populations	3
SPMD 4997	Problems (Sport Nutrition)	3
SPMD 4998	Internship	6
Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following: ³		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
Electives, to bring the total credits to 120 ⁵		23
Total Credits		120-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course of their choosing first.

³ Students who select A ST 311 Statistical Applications or SPMD 3350 Inferential Statistics in Sport and Exercise Science will need to take an additional General Education course to complete the requirement.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁵ A list of approved electives can be found on the degree plans. Degree plans can be found at 1) Center for Academic Advising and Student Support (Garcia Annex), 2) College of Education (O'Donnell Hall) Advising Center, 3) Kinesiology Website (<https://kind.nmsu.edu/kin/> (<https://kind.nmsu.edu/>)), 4) Kinesiology Department (Room 204, Activity Center), and/or 5) The Kinesiology Program Director.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
SPMD 1310	Introduction to Kinesiology	3
Choose one from the following:		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1230G	Algebra-Based Physics I	
PSYC 1110G	Introduction to Psychology	3
Area VI: Creative and Fine Arts		3
Credits		17

Semester 2

Area I: English Comp Level 2		3
Area II: Mathematics		3-4
Choose one from the following:		4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1240G	Algebra-Based Physics II	
Area V: Humanities		3
SPMD 1350	Social Foundations of Physical Activity	3
Credits		16-17

Second Year

Semester 1		Credits
Area I: Oral Communications		3
General Education Elective		3-4
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
Viewing a Wider World Course ³		3
Credits		16-17
Semester 2		Credits
SPMD 3210	Anatomy and Physiology II	3

SPMD 3210L	Anatomy and Physiology II Lab	1
SPMD 3650	Motor Development	3
Physical Education Course (PHED)		1
Physical Education Course (PHED)		1
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 2350G	Statistical Methods	
MATH 1350G	Introduction to Statistics	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
Viewing a Wider World Course ³		3

Credits 15

Third Year

Semester 1

SPMD 3410	Exercise Physiology	3
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
or SPMD 3610	or Health and Exercise Psychology	
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3

Credits 16

Semester 2

SPMD 3710	Motor Learning	3
SPMD 4350	Exercise Testing and Prescription	3
SPMD 4997	Problems (Sport Nutrition)	3
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
Physical Education Course (PHED)		1

Credits 16

Fourth Year

Semester 1

SPMD 4250 & 4250L	Principles of Strength and Conditioning and Principles of Strength and Conditioning Laboratory ¹	4
SPMD 4410	Exercise for Special Populations ¹	3
Kinesiology Approved Elective		3
Kinesiology Approved Elective		2
Students who need to be enrolled in 15 credits for Financial Aid purposes will need to take additional elective credits		

Credits 12

Semester 2

Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
SPMD 4998	Internship ¹	6
Students who need to be enrolled in 15 credits for Financial Aid purposes will need to take additional elective credits		

Credits 12

Total Credits 120-122

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Select from approved Department list at <https://kind.nmsu.edu/kin/> (<https://kind.nmsu.edu/>).

Kinesiology (Performance Psychology) - Bachelor of Science in Kinestiology

Kinesiology prepares students for many fields in allied health. Career choices include, but are not limited to, medical school, physical therapy, occupational therapy, athletic training, corporate health and wellness, chiropractic medicine, dentistry, optometry, pharmacy, and much more.

The Bachelor of Science in Kinesiology degree program can be completed in one of three concentration areas: Exercise Science, Performance Psychology, or Physical Education. For the required credit hours, see the program descriptions below. Regardless of the concentration, students are required to complete 120 total semester hours for the Kinesiology degree. Additionally, students pursuing a Kinesiology degree will be responsible for ensuring that they complete 48 upper division credits (3000 (300) and 4000 (400) level courses). Kinesiology students must maintain a minimum 2.75 GPA to enroll in most upper-division SPMD courses. ENGL 1110G, Area II General Education courses, Kinesiology courses, and Approved Electives must be completed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education, Viewing a Wider World, and program-specific courses to total a minimum of 120 credits. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Information about Kinesiology and potential career opportunities may be obtained at the Department of Kinesiology (<https://kind.nmsu.edu/>), Activity Center 204, phone 575-646-2215.

With a concentration in Performance Psychology, students can also receive a Minor in Psychology. Official Minor documentation and verification of completion must be approved through the Department of Psychology.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
<i>English Composition - Level 2¹</i>		
Choose one from the following: (ENGL 2210G or ENGL 2215G recommended)		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional & Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication¹</i>		3
<i>Area II: Mathematics^{1,2}</i>		3-4
MATH 1220G	College Algebra (or higher)	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11

Area III: Laboratory Sciences Courses (8 credits) (Preferred Below) ¹	
Choose two (8 credits) of the following: (BIOL 2110G recommended)	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab
Area IV: Social/Behavioral Sciences Course (3 credits) ¹	
PSYC 1110G	Introduction to Psychology
Area V: Humanities ¹	
Area VI: Creative and Fine Arts ¹	
General Education Elective ¹	
Viewing a Wider World ⁴	
Departmental/College Requirements	
Choose three of the following:	
PHED 1230	Individual Sport:
PHED 1290	Team Sport:
PHED 1310	Swim I:
PHED 1410	Yoga:
PHED 1430	Pilates:
PHED 1510	Training:
PHED 1620	Fitness:
PHED 1670	Aerobics:
PHED 1830	Running:
SPMD 1310	Introduction to Kinesiology
SPMD 1350	Social Foundations of Physical Activity
SPMD 2210	Anatomy and Physiology I
SPMD 2210L	Anatomy and Physiology Laboratory
SPMD 2250	Fitness for Health and Sport
SPMD 3210	Anatomy and Physiology II
SPMD 3210L	Anatomy and Physiology II Lab
SPMD 3410	Exercise Physiology
SPMD 3450	Biomechanics
SPMD 3450L	Biomechanics Laboratory
SPMD 3550	Psychology of Sport
SPMD 3650	Motor Development
SPMD 3610	Health and Exercise Psychology
SPMD 3710	Motor Learning
SPMD 4998	Internship
Psychology Courses	
Students can select the official Psychology Minor requiring 18 credit hours in PSYC ⁵	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)	
Choose one from the following: ³	
A ST 311	Statistical Applications
MATH 1350G	Introduction to Statistics
MATH 2350G	Statistical Methods

SPMD 3350	Inferential Statistics in Sport and Exercise Science
Electives, to bring the total credits to 120 ⁶	
Total Credits	

15

120-122

- ¹ See the General Education (p. 220) section of the catalog for a full list of courses
- ² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course of their choosing first.
- ³ Students who select A ST 311 Statistical Applications or SPMD 3350 Inferential Statistics in Sport and Exercise Science will need to take an additional General Education course to complete the requirement.
- ⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses
- ⁵ Courses used for PSY minor cannot also be used for credit as electives.
- ⁶ A list of approved electives can be found on the degree plans. Degree plans can be found at 1) Center for Academic Advising and Student Support, 2) Kinesiology Website (<https://kind.nmsu.edu/kin/>), 3) Kinesiology Department (Room 204, Activity Center), and/or 4) Kinesiology Program Director.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I	4
Choose one from the following:		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1230L	Algebra-Based Physics I Lab	
PSYC 1110G	Introduction to Psychology	3
Area VI: Creative and Fine Arts		3
SPMD 1310	Introduction to Kinesiology	3
Credits		17

Semester 2

Area I: English Comp Level 2		3
Area II: Mathematics		3-4
Choose one from the following:		4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1240G	Algebra-Based Physics II	
Area V: Humanities		3

SPMD 1350	Social Foundations of Physical Activity	3
Credits		16-17
Second Year		
Semester 1		
Area I: Oral Communications		3
General Education Elective		3-4
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
Viewing Wider World		3
Credits		16-17
Semester 2		
SPMD 3210	Anatomy and Physiology II	3
SPMD 3210L	Anatomy and Physiology II Lab	1
SPMD 3410	Exercise Physiology	3
Psychology Course-See Psychology Dept Courses (300/400)		3
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
Viewing Wider World		3
Credits		16
Third Year		
Semester 1		
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
SPMD 3650	Motor Development	3
Psychology Course-See Psychology Dept Courses (300/400)		3
Psychology Course-See Psychology Dept Courses (300/400)		3
Credits		16
Semester 2		
SPMD 3610	Health and Exercise Psychology	3
SPMD 3710	Motor Learning	3
Psychology Course-See Psychology Dept Courses (300/400)		3
Psychology Course-See Psychology Dept Courses (300/400)		3
Psychology Course-See Psychology Dept Courses (300/400)		3
Credits		15
Fourth Year		
Semester 1		
Physical Education Course (PHED)		1
Physical Education Course (PHED)		1
Physical Education Course (PHED)		1
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
Kinesiology Approved Elective: If Needed to enroll in 15 credits for Financial Aid		
Credits		12
Semester 2		
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
SPMD 4998	Internship	6

Kinesiology Approved Elective: If Needed to enroll in 15 credits for Financial Aid

Credits	12
Total Credits	120-122

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ A list of approved electives can be found at <https://kind.nmsu.edu/kin/> (<https://kind.nmsu.edu/>).

Kinesiology (Physical Education) - Bachelor of Science in Kinestiology

Kinesiology is a great option and prepares students for many fields in allied health. Career choices include, but are not limited to, medical school, physical and occupational therapy, athletic training, corporate health and wellness, chiropractic medicine, dentistry, optometry, pharmacy, and much more.

The Bachelor of Science in Kinesiology degree program can be completed in three concentration areas: Exercise Science, Performance Psychology, or Physical Education. For the required credit hours, see the program descriptions below. Regardless of the concentration, students must complete 120 total semester hours for the Kinesiology degree. Additionally, students pursuing a Kinesiology degree will be responsible for ensuring that they complete 48 upper division credits (3000 (300) and 4000 (400) level courses). Kinesiology students must maintain a minimum 2.75 GPA to enroll in most upper-division SPMD courses. ENGL 1110G, Area II General Education courses, Kinesiology courses, and Approved Electives must be completed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education, Viewing a Wider World, and program-specific courses to total a minimum of 120 credits. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

With a concentration in Physical Education and successfully meeting state requirements, students will be eligible to teach in the school system (e.g., Elementary, Middle and High School settings).

Information about Kinesiology and potential career opportunities may be obtained at the Department of Kinesiology, Activity Center 204, phone 575-646-2215.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I	
<i>English Composition - Level 1</i> ¹		3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i>		

MATH 1220G	College Algebra ²	3
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		11
Area III: Laboratory Sciences Course (8 credits) ¹		
Area IV: Social/Behavioral Sciences (3 credits)		
CEPY 1120G	Human Growth and Behavior (Required with a "C-" or better)	
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
Viewing a Wider World ³		6
Must be from two different colleges, cannot be DANC 3510V/ HNRS 347V		
Departmental/College Requirements		
<i>Kinesiology Core (specific to Physical Education only)</i>		
SPMD 1350	Social Foundations of Physical Activity	3
SPMD 2210	Anatomy and Physiology I ⁴	3
SPMD 2210L	Anatomy and Physiology Laboratory ⁴	1
SPMD 2250	Fitness for Health and Sport	3
SPMD 3710	Motor Learning	3
<i>K-12 Physical Education Concentration Courses</i>		
SPMD 3110	Racquet Sports	2
SPMD 3120	Theory and Technique of Lifelong Outdoor Leisure Activities	2
SPMD 3130	Theory and Technique of Sports and Games	2
SPMD 3140	Designing Student Centered Afterschool Physical Activity Clubs	3
SPMD 3150	Theory and Technique of Dance and Rhythms	2
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics	3
SPMD 3310	Lifetime Activities	2
SPMD 3650	Motor Development	3
<i>Professional Education Courses</i>		
CEPY 2110	Learning in the Classroom ⁴	3
EDUC 1995	Field Experience I ⁴	1
EDUC 3120	Multicultural Education ^{4,5}	3
EDLT 3110	Integrating Technology with Teaching ⁴	3
READ 4330	Content Area Literacy ⁶	3
SPED 3105	Introduction to Special Education in a Diverse Society ⁴	3
SPMD 3160	Elementary School Physical Education	3
SPMD 4110	Adapted Physical Education ⁶	3
SPMD 4130	Methods of Teaching Secondary Physical Education ⁶	6
<i>Student Teaching</i>		
EDUC 4820	Secondary Student Teaching ⁶	9
EDUC 4821	Middle and High School Student Teaching Seminar ⁶	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose two from the following:		6
ANTH 1115G	Introduction to Anthropology	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	

ECON 2120G	Principles of Microeconomics	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
HNRS 2170G	The Human Mind	
HNRS 2172G	Archaeology: Search for the Past	
HNRS 2180G	Citizen and State Great Political Issues	
JOUR 105G	Media and Society	
LING 2110G	Introduction to the Study of Language and Linguistics	
PHLS 1110G	Personal Health & Wellness	
PSYC 1110G	Introduction to Psychology	
SOWK 2110G	Introduction to Human Services & Social Work	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
GNDP 2110G	Introduction to Women, Gender, and Sexuality Studies	
GNDP 2120G	Representing Women Across Cultures	
One additional Area V/VI: Humanities or Creative & Fine Arts Course (must be a different subject area than the course selected above) ¹		3
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take prerequisites needed to enter either course first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Pre/co-requisite to Teacher Ed program

⁵ Must be completed prior to Submission of TEP portfolio

⁶ Requires admission to Teacher Ed Program (TEP)

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested study plan for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
CEPY 1120G	Human Growth and Behavior	3
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra	3-4
or MATH 1250G	or Trigonometry & Pre-Calculus	
SPMD 1350	Social Foundations of Physical Activity	3
Area V: Humanities Course ²		3
Credits		16-17

Semester 2

COMM 1115G	Introduction to Communication	3
EDUC 1995	Field Experience I (Spring Only)	1
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	or Applications of Calculus I	

SPMD 2250	Fitness for Health and Sport	3
An additional Area IV: Social and Behavioral Science Course (for licensure purposes) ²		3
Area VI: Creative and Fine Arts Course ²		3

Credits **16**

Second Year

Semester 1

CEPY 2110	Learning in the Classroom	3
ENGL 2221G	Writing in the Humanities and Social Science	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Science Course (BIOL, CHEM, or PHYS) ²		4
An additional Area IV: Social and Behavioral Science Course (for licensure purposes) ²		3

Credits **16**

Semester 2

EDUC 3120	Multicultural Education	3
EDLT 3110	Integrating Technology with Teaching	3
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	4
SPMD 3110	Racquet Sports (Spring Only)	2
Either an additional Area V: Humanities or Area VI: Creative and Fine Arts Course (for licensure purposes) ²		3

Credits **15**

Third Year

Semester 1

APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
SPMD 3120	Theory and Technique of Lifelong Outdoor Leisure Activities (Fall Only)	2
SPMD 3130	Theory and Technique of Sports and Games (Fall Only)	2
SPMD 3150	Theory and Technique of Dance and Rhythms (Fall Only)	2
SPMD 3310	Lifetime Activities	2
SPMD 3710	Motor Learning	3
Area III: Laboratory Science Course ²		4

Credits **15**

Semester 2

APPLY TO STUDENT TEACHING		
READ 4330	Content Area Literacy (Spring Only)	3
SPMD 3140	Designing Student Centered Afterschool Physical Activity Clubs (Spring Only)	3
SPMD 3160	Elementary School Physical Education (Spring Only)	3
SPMD 3650	Motor Development (Spring Only)	3
SPMD 4110	Adapted Physical Education (Spring Only)	3

Credits **15**

Fourth Year

Semester 1

SUBMIT STEP PACKET		
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics (Fall Only)	3
SPMD 4130	Methods of Teaching Secondary Physical Education (Fall Only)	6
VWW: Viewing a Wider World Course ³		3
VWW: Viewing a Wider World Course ³		3

Credits **15**

Semester 2

EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3

Credits **12**

Total Credits **120-121**

¹ These courses may have prerequisites and/or co-requisites, and it is the student's responsibility to check to ensure the requirements are fulfilled.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Dance - Undergraduate Minor

The Dance Minor includes courses in dance technique, choreography, and performance with opportunities in history and pedagogy. Students should take a minimum of 18 credits, with at least nine hours of upper division coursework.

Prefix	Title	Credits
Dance Technique Requirements		
<i>One semester of Ballet Technique from:</i>		1-2
DANC 1130	Ballet I	
DANC 2130	Ballet II	
DANC 3130	Ballet III	
<i>One semester of Modern Dance Technique from:</i>		1-2
DANC 1150	Modern Dance I	
DANC 2150	Modern Dance II	
DANC 3150	Modern Dance III	
<i>At least two courses from Ballet, Modern Dance, or the following:</i>		3-4
DANC 1131	Introduction to Ballroom Dance	
DANC 1140	Flamenco I	
DANC 1160	Jazz Dance I	
DANC 1161	Tap Dance I	
DANC 1220	Introduction to Latin Social Dance	
DANC 2157	Hip-Hop Dance	
DANC 2160	Jazz Dance II	
DANC 2161	Tap Dance II	
DANC 2460	Dance for Musical Theatre	
Dance Minor Core Requirements		
DANC 1110G	Dance Appreciation	3
DANC 2270	Dance Improvisation	2
DANC 3265	Principles of Choreography I	3
<i>Choose one of the following:</i>		3
DANC 3350	Dance Pedagogy I	
DANC 3510V	World Dance	
DANC 3610	Dance History	
<i>Two semesters of the following:</i>		2
Courses are repeatable for credit		
DANC 3114	DanceSport Ensemble	
DANC 3250	Contemporary Dance Ensemble	
Total Credits		18-21

Exercise Science - Undergraduate Minor

Prefix	Title	Credits
Required Courses ^{1,2}		
SPMD 2250	Fitness for Health and Sport	3
SPMD 3410	Exercise Physiology	3
SPMD 4350	Exercise Testing and Prescription	3
Select a minimum of 9 credits from the following:		9
SPMD 3450 & 3450L	Biomechanics and Biomechanics Laboratory	
SPMD 3550	Psychology of Sport	
SPMD 3610	Health and Exercise Psychology	
SPMD 3650	Motor Development	
SPMD 3710	Motor Learning	
SPMD 4210	Advanced Exercise Physiology	
SPMD 4410	Exercise for Special Populations	
SPMD 4250 & 4250L	Principles of Strength and Conditioning and Principles of Strength and Conditioning Laboratory	
Total Credits		18

¹ Official minor documentation must be completed with the Department of Kinesiology and Dance. Upon completion of all coursework, final signature approval must be obtained by the Department Head or Kinesiology Program Director.

² Many courses above such as SPMD 3410, SPMD 3450, SPMD 3450L, SPMD 3710, SPMD 4210, SPMD 4250, SPMD 4250L, SPMD 4350 and SPMD 4410 all require SPMD 2210 Anatomy and Physiology I as a prerequisite.

Nursing Undergraduate Program Information

NMSU's School of Nursing (SON) offers a Bachelor of Science in Nursing (BSN) degree. The degree plan provides two options to accommodate either the beginning nursing student and the beginning nursing student with a baccalaureate degree in another major. Students graduating from the two options are eligible to take the NCLEX-RN® examination for licensure as a registered nurse upon completion of their program of studies. This BSN degree is also offered at two additional satellite sites at NMSU Grants, NM and NMSU Alamogordo, NM.

The BSN degree program is approved by the New Mexico Board of Nursing and accredited by the Commission on Collegiate Nursing Education (CCNE). Approval by the New Mexico Board of Nursing is required for graduates to be eligible to take the National Council Licensing Examination (NCLEX-RN®) for licensure as a registered nurse. Accreditation by the CCNE assures prospective students and employers that the program has met national education standards.

The NMSU SON is a full member of the New Mexico Nursing Education Consortium (NMNEC) and offers the NMNEC BSN curriculum.

NMSU pre-nursing and transfer students should contact the pre-nursing advisors in the Center for Academic Advising and Student Support (CAASS) at Educational Services Center, Suite 200 for information on the pre-nursing curriculum. Second degree students should contact the

School of Nursing Advising Center (<https://schoolofnursing.nmsu.edu/nursing/son-pages/SON-Advising-Center.html>) to determine eligibility for the Pathways or Roadrunner options. Contact the School of Nursing Advising Center (<https://schoolofnursing.nmsu.edu/nursing/son-pages/SON-Advising-Center.html>) for the BSN program application (all options) and information about the HESI A2 Entrance Exam, Military students, and specific questions about the nursing program.

School of Nursing Advising Office: HSS 110, 575-646-3812, nursing@nmsu.edu

Application and Admission Requirements: Traditional 4-year BSN Program

Application and admission requirements for the four-year BSN program are as follows:

1. Obtain admission to NMSU.
2. Satisfy NMSU basic academic competency requirements in English and Math.
3. Completed or in the last semester of nursing prerequisite courses (see BSN degree plan (<https://schoolofnursing.nmsu.edu/nursing/son-documents/BSN-4-Sem-Degree-plan-2022-2023-revised-2021-11-11.pdf>)).
4. Prerequisite science courses must have been completed within the past seven years at the time of application.
5. Minimum nursing prerequisite course GPA 2.75 or above, which includes grades earned from all higher education institutions.
6. Minimum of C- grade in all prerequisite and general education courses
7. Completion of the HESI-A2 Admission Exam (<https://schoolofnursing.nmsu.edu/nursing/son-pages/faq-bsn-admission.html#hesi>) (Biology, Chemistry, Math and all English sections) by the application deadline with a score of > 75% in each section.
8. Submit a complete BSN program application and all supporting documents by the program deadline (see below). No incomplete applications will be considered.

Students should meet with a School of Nursing advisor to determine eligibility to apply to the five-semester BSN program and to obtain the BSN program application.

Application deadlines:

- March 15th—for consideration for Fall admission to the nursing major (Las Cruces, Grants and Alamogordo applicants)
- September 1st—for consideration for Spring admission to the nursing major (Las Cruces applicants only).

For more information on the application/admission policies and procedures, please visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/nursing/son-pages/bsn-program.html>).

NOTES: Admission to the BSN program is competitive and available seats in each class are limited. Admission scores are based primarily on nursing pre-requisite GPA and scores on the HESI A2 Entrance Exam. Any applicant not admitted to the nursing major may reapply during the next admission cycle. Applicants for fall semester admission may not finish nursing prerequisites in the summer session immediately preceding the fall semester in which they wish to be admitted.

Application and Admission Requirements: Second Degree Options (Roadrunner and Pathways)

The Nursing Program offers two options for 2nd degree seeking students. Both programs are designed for students who already have a Bachelor's degree in another major but would like to pursue a Bachelor of Science in Nursing (BSN). The Roadrunner option starts in the summer semester and is completed in 19 months. Students in the Pathways option are admitted with the traditional 4-year BSN students in fall and spring semesters. Please refer to the School of Nursing website (<https://schoolofnursing.nmsu.edu/nursing/son-pages/2nd-degree-BSN-options.html>) for more information about the two options.

Application and admission requirements for the Roadrunner and Pathways BSN options are as follows:

1. Obtain admission to NMSU as a second bachelor's degree-seeking student.
2. Have a minimum GPA of 3.0 on a 4.0 scale for first bachelor's degree.
3. Achieve a B grade in all nursing prerequisite courses: Anatomy and Physiology or A&P I and A&P II (8 credits), Microbiology with lab, and Statistics (3 credits). Roadrunner applicants must have completed Pathophysiology (4-6 credits) prior to the start of the program.
4. Nursing prerequisite courses must not be older than 7 years at the time of application. Pathway applicants must complete at least two prerequisites prior to application. Roadrunner applicants must complete three prerequisites prior to application.
5. Completion of the HESI-A2 Admission Exam (<https://schoolofnursing.nmsu.edu/nursing/son-pages/bsn-program.html>) (Biology, Chemistry, Math and all English sections) by the application deadline with a score of > 75% in each section.
6. Submit a complete BSN program application and all supporting documents by the program deadline (see below). No incomplete applications will be considered.

Application deadlines:

- March 15th—for consideration for Fall admission to the nursing major (Las Cruces, Grants and Alamogordo Pathways applicants)
- February 1st—for consideration for Summer admission to the nursing major (Las Cruces campus Roadrunner option)
- September 1st—for consideration for Spring admission to the nursing major (Las Cruces Pathways applicants only)

For more information on the application/admission policies and procedures, please visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/nursing/son-pages/bsn-program.html>). Second degree students must contact an advisor from the NMSU School of Nursing Advising Center (<https://schoolofnursing.nmsu.edu/nursing/son-pages/SON-Advising-Center.html>).

NOTES: Admission to the BSN program is competitive and available seats in each class are limited. Admission scores are based primarily on nursing prerequisite GPA and scores on the HESI A2 Entrance Exam. Any applicant not admitted to the nursing major may reapply during the next admission cycle. Pathways applicants for fall semester admission may not finish nursing prerequisites in the summer session immediately preceding the fall semester in which they wish to be admitted.

Graduate Program Information MSN Degree

The Master's of Science in Nursing (MSN) provides graduate level education and training in the field of Nursing Leadership and Administration. Students enrolled in the Nursing Leadership and Administration MSN program acquire the knowledge and experience to assume leadership positions in a wide range of health care systems and fulfill the fundamental requirements to secure middle and top-level administrative positions in health care agencies. The MSN Leadership and Administration degree option is available to nurses who possess an RN license and a Bachelor of Science degree in Nursing (BSN). Courses for this degree are delivered through distance education (i.e., online), which allows nurses to advance their careers while working and remaining in their communities.

Please visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/nursing/son-pages/MSN-Program.html>) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-2772.

Application deadline: July 1 for a fall semester start.

DNP Degree

The Doctor of Nursing Practice (DNP) degree is a terminal degree in nursing that focuses on advancing nursing practice directed towards improving nursing care outcomes for individuals, families, communities, and systems. The program emphasizes culturally sensitive practice, evidenced-based practice, and translation of research to practice as it relates to improving the care of individuals, families, groups and communities experiencing or at risk for health disparities. The complexity of health care combined with rapidly increasing knowledge and the need for both evidence-based practice and translation of research to practice support the scholarship goals of the DNP. Students in the DNP program complete a year-long final project. A minimum of 1000 supervised clinical contact hours must be completed for the DNP degree.

MSN-DNP

The MSN-to-Doctor of Nursing Practice (DNP) concentration in Population Health Leadership allows nurses with a Master's degree in a nursing field to obtain a terminal degree with advanced education in population health, evidence-based practice, quality improvement, leadership, policy advocacy, informatics, and systems thinking. Nurses with the DNP degree are prepared to lead efforts to make healthcare system changes and improve patient outcomes. Nurses with the MSN degree who are working in APRN or non-APRN roles are encouraged to apply. Upon admission, a review of supervised contact hours obtained in the MSN degree will be conducted. Students will be notified regarding the number of supervised clinical contact hours required in the program to meet the minimum requirement of 1000 supervised total contact hours.

Application deadline: May 1st for a fall semester start.

BSN-DNP

The BSN Doctor of Nursing Practice (DNP) option allows baccalaureate-prepared RNs to assume advanced practice nursing (APRN) roles within the health care arena in the following specialty areas: Family Nurse Practitioner, Psychiatric-Mental Health Nurse Practitioner and Nurse Anesthesiology. In this DNP concentration, students must take courses in advanced pathophysiology, advanced assessment, and advanced pharmacology, in addition to specialty courses within their area of study.

The clinical training consists of over 1000 supervised clinical contact hours completed in the student's clinical specialty and related areas.

Please visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/nursing/son-pages/DNP-Program.html>) or contact the Nursing Graduate Advisor for more information about application and admission requirements at 575-646-2772.

Application deadlines for BSN-DNP

- Family Nurse Practitioner and Psychiatric Nurse Practitioner: March 1 for a fall semester start
- Nurse Anesthesia: February 1 for a fall semester start

Post-Graduate APRN Certificates

This program is for currently certified Master's or doctorally-prepared nurse practitioners, certified nurse midwives, and certified registered nurse anesthetists who wish to obtain the coursework needed to sit for certification in another specialty Post-Graduate APRN certificates are offered in the following specialties: Family Nurse Practitioner and Psychiatric-Mental Health Nurse Practitioner.

Please visit the School of Nursing website (<https://schoolofnursing.nmsu.edu/nursing/son-pages/APRN-Program.html>) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-2772.

Application deadline: January 15 for a fall semester start.

PhD in Nursing Science Degree

The intent of the nursing PhD program is to prepare individuals who can assume leadership roles in academia, to support scholarship in teaching, research, and professional service activities. The focus of the program is on nursing scholarship that promote the development of new knowledge directed at improving nursing care outcomes for individuals, families, communities and systems. Holistic nursing scholarship as it relates to improving the care of individuals, families, groups and communities experiencing or at risk for health disparities is emphasized. Students in the PhD program complete a dissertation.

The School of Nursing is not currently admitting students to the PhD in Nursing Science degree program.

Degrees for the Department Bachelor Degree(s)

- Nursing - Bachelor of Science in Nursing (p. 1191)

Master Degree(s)

- Nursing Leadership and Administration - Master of Science in Nursing (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-leadership-administration-msn-online/>)

Doctoral Degree(s)

- Nursing - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-dnp-online/>)
- Nursing Practice (Family Nurse Practitioner)- Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-family-nurse-practitioner-dnp-online/>)
- Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice (p. 196)

- Nursing Practice (Population Health Leadership) - Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-population-health-leadership-dnp-online/>)
- Nursing Practice (Psychiatric/Mental Health)- Doctor of Nursing Practice (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/nursing-practice-psychiatric-mental-health-dnp-online/>)

Post Graduate APRN Certificate(s)

- Family Nurse Practitioner - Post-Masters Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/family-nurse-practitioner-pm-certificate-online/>)
- Psychiatric/Mental Health Nurse Practitioner - Post-Masters Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/psychiatric-mental-health-nurse-practitioner-pmc-online/>)

Alexa Doig, Director of the School of Nursing

Wanda Borges, Associate Director for Graduate Programs

Teresa León, Associate Director for the Undergraduate Program

Sandra Perez, Assistant Director for Student Success

Penny Jimerson, Assistant Director of Operations

Professors

W. Borges, A. Doig, T. Keller, L. Summers

Associate Professors

J. Ade-Oshifogun, C. DeBlieck, S. Lynch, S. Noe

Assistant Professors

R. Greenwald, L. Saiki

College Professors

M. Chalenor

College Associate Professors

D. Cates, E. Kuchler, C. Lombardi, T. León, S. Perez, J. White, J. Williams

College Assistant Professors

R. Arciniega, S. Cohen, C. Cothorn, J. Creager, S. Davidson, E. Falkner, S. Flaherty, T. Hayth, E. Hendricks, A. Hunt, P. Jimerson, H. Magill, N. May, L. Monarrez, B. Natividad, J. Peck, E. Ramirez, T. Schumacher, V. Stanton, N. Thurston, C. Torres, E. Tracy, K. Ventura, E. Yglecias

New Mexico Nursing Education Consortium

NMNC 3110. Introduction to Nursing Concepts

3 Credits (3)

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNC course number: NMNC 1110. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Corequisite: NMNC 3120, NMNC 3135.

Learning Outcomes

1. Integrate knowledge from nursing pre- and co-requisites into a conceptual learning model.
2. Apply conceptual learning to select nursing concepts.
3. Define personal values, beliefs, and attitudes about health and wellness.
4. Describe importance of identifying patient safety issues.
5. Describe roles and values of nursing and members of the health care team.
6. Describe standards and regulations that apply to nursing practice.

NMNC 3120. Evidence-Based Practice

3 Credits (3)

The focus of this course is the principles of evidence-based nursing practice. It includes the identification of clinical practice problems, the evaluation of available evidence, and the integration of evidence with clinical expertise and patient preferences in application to practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Corequisite: NMNC 3110, NMNC 3135.

Learning Outcomes

1. Examine integrating evidence-based practice with diverse patients' values.
2. Identify clinical practice problems and issues.
3. Explain the research process.
4. Describe how evidence is generated through the research process.
5. Appraise evidence and standards of care that support best clinical outcomes and patient safety.
6. Utilize informatics to access evidence-based practice guidelines.

NMNC 3135. Principles of Nursing Practice

4 Credits (4)

This course introduces the nursing student to the application of concepts through clinical skills in seminar, laboratory, and/or clinical settings. Principles of communication, assessments, safety, and interventions including accurate calculation, measurement, and administration of medications will be included. Same as NMNC course number: NMNC 1135. Restricted to: BSN, BSNP, and BSNR Majors. May be repeated up to 4 credits.

Corequisite: NMNC 3110, NMNC 3120.

Learning Outcomes

1. Describe the different types and characteristics of communication in professional nursing practice.
2. Utilize the concepts presented in Level One nursing courses in the application to the care of the patient.
3. Demonstrate the principles of safety during the implementation of nursing skills.
4. Demonstrate the learned skills in patient based scenarios.
5. Utilize the nursing process to provide safe and effective care.

NMNC 3210. Health and Illness Concepts I

3 Credits (3)

This course will focus on health and illness concepts across the lifespan. Concepts covered are related to homeostasis/regulation, sexuality/reproductive, protection/movement, and emotional processes. Same as NMNC course number: NMNC 1210. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3220, NMNC 3230, NMNC 3235.

Learning Outcomes

1. Describe the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Discuss evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Explain the collaboration necessary related to the concepts/exemplars of the course.
4. Utilize informatics and resources related to the concepts/exemplars of the course.
5. Integrate considerations of normal physiology and healthy adaptations into nursing practice of patients across the lifespan.

NMNC 3220. Health Care Participant**3 Credits (3)**

This course introduces the nursing student to the attributes of the health care participant as an individual, a family, or a community. Same as NMNC course number: NMNC 1220. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3210, NMNC 3230, NMNC 3235.

Learning Outcomes

1. Identify values, beliefs and attitudes toward health and illness of the health care recipient.
2. Articulate the role of nursing in relation to the health of vulnerable populations and elimination of health disparities.
3. Describe the protective and predictive factors which influence the health of families, groups, communities, and populations.
4. Describe the use of evidence-based practices to guide health teaching, health counseling, screening, outreach, disease and outbreak investigation, referral, and follow-up throughout the lifespan.
5. Describe the use of information and communication technologies in preventive care.
6. Examine the health care and emergence preparedness needs of the local community and in the state of New Mexico.
7. Identify clinical prevention and population-focused interventions with attention to effectiveness, efficiency, cost-effectiveness, and equity.

NMNC 3230. Nursing Pharmacology**3 Credits (3)**

This course introduces the nursing student to pharmacologic nursing practice from a conceptual approach. Same as NMNC course number: NMNC 1230. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3210, NMNC 3220, NMNC 3235.

Learning Outcomes

1. Identify the nurse's professional role related to pharmacotherapeutics in diverse populations across the lifespan.
2. Identify safety issues and minimize risk potential associated with pharmacotherapeutics and complementary and alternative medicine.
3. Utilize evidence-based information integrating pharmacologic and pathophysiologic concepts to guide medication therapeutics.
4. Describe health care system protocols related to pharmacotherapeutics.
5. Identify methods of communication with the health care team related to pharmacotherapeutics.
6. Utilize informatics systems related pharmacotherapeutics.
7. Describe common classes of drugs that are used in health care, including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics.

NMNC 3235. Assessment and Health Promotion**4 Credits (4)**

This course introduces the nursing student to the assessment of and the health promotion for the health care participant as an individual, a family, or a community. This course uses seminar, laboratory and/or clinical settings. Same as NMNC course number: NMNC 1235. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3210, NMNC 3220, NMNC 3230.

Learning Outcomes

1. Assess physical health including a focus on the health/illness beliefs, values, attitudes, developmental level, functional ability, culture, and spirituality of the participant.
2. Assess family health including a focus on family health history, environmental exposures, and family genetic history to identify current and future health problems.
3. Collaborate with a community to assess their health needs
4. Utilize community assessment data and evidence-based practice as basis for identifying community health needs.
5. Document health assessments in electronic health record or written formats.
6. Share community assessment data with other health care professionals to identify needed interventions.
7. Explain the role of the nurse in relation to advocacy for the health care recipient.
8. Analyze education materials for health literacy concerns.

NMNC 4310. Health & Illness Concepts II**3 Credits (3)**

This course covers health and illness concepts across the lifespan with the focus on chronic conditions. Concepts covered are related to oxygenation and hemostasis, homeostasis and regulation, protection and movement, and cognition and behavior processes. Same as NMNC course number: NMNC 2310. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.

Corequisite: NMNC 4320, NMNC 4335.

Learning Outcomes

1. Relate the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Investigate evidenced-based practice, standards of nursing care, and factors to improve safety related to selected concepts and exemplars.
3. Examine how members of the health care team collaborate in the delivery of care related to selected concepts and exemplars.
4. Discuss available technology for the delivery of nursing care related to selected concepts and exemplars.
5. Apply selected health and illness concepts to the nursing care of patients across the lifespan.

NMNC 4320. Professional Nursing Concepts I**3 Credits (3)**

This course covers foundational concepts for professional development, including selected professional attributes and care competencies. Same as NMNC course number: NMNC 2320. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.

Corequisite: NMNC 4310, NMNC 4335.

Learning Outcomes

1. Examine the ethical values, virtues, principles, and policies that guide the moral delivery of health care.
2. Relate the nurse's interpretation of patient needs, concerns, and health problems with nursing decisions.
3. Discuss the factors which motivate individuals, groups, and organization to deliver quality nursing care.
4. Determine how interactions of health care team members provide quality patient care.

NMNC 4335. Care of Patients with Chronic Cndtns**4 Credits (8P)**

The focus of this course is to provide safe, evidence-based nursing care for patients with chronic conditions, across the lifespan in a variety of settings. This course builds upon curricular concepts. This course is a combination of lab and clinical. Same as NMNC course number: NMNC 2335. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.

Corequisite: NMNC 4310, NMNC 4320.

Learning Outcomes

1. Demonstrate ethical practice in the delivery of nursing care to patients with chronic conditions.
2. Apply understanding of the principles of safe nursing care for patients with chronic conditions.
3. Demonstrate knowledge of appropriate evidence-based protocols when providing nursing care to patients with chronic conditions.
4. Apply understanding of appropriate health care policy, finance, and regulatory environments in the care of patients with chronic conditions.
5. Communicate effectively with patients with chronic conditions and health care team members.
6. Demonstrate an understanding of the technology used in the care of patients with chronic conditions.
7. Utilize the nursing process to deliver nursing care to patients with chronic conditions.

NMNC 4410. Health & Illness Concepts III**4 Credits (4)**

This course will cover health and illness concepts, with the focus on acute conditions across the lifespan. Concepts covered are related to homeostasis/ regulation, oxygenation/ hemostasis, protection/ movement, and emotional processes. Same as NMNC course number: NMNC 2410. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.

Corequisite: NMNC 4435, NMNC 4445.

Learning Outcomes

1. Anticipate health care participant's risk for potentially harmful situations related to the concepts/exemplars of the course.
2. Integrate evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Differentiate the multiple roles of the health care team related to the concepts/exemplars of the course.
4. Integrate use of appropriate technology related to the concepts/ exemplars of the course.
5. Interrelate risk factors, concepts, physiologic processes, patient attributes, and clinical management of the exemplars covered in this course.

NMNC 4435. Clinical Intensive I**4 Credits (4)**

This is the first of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNC course number: NMNC 2435. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.

Corequisite: NMNC 4410, NMNC 4445.

Learning Outcomes

1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into plan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care settings.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4445. Clinical Intensive II**4 Credits (4)**

This is the second of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNEC course number: NMNC 404. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.

Corequisite: NMNC 4410, NMNC 4435.

Learning Outcomes

1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into plan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care setting.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4510. Concept Synthesis**3 Credits (3)**

This course focuses on the synthesis of curricular concepts in the care of complex patients. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.

Corequisite: NMNC 4520, NMNC 4535, NMNC 4545.

Learning Outcomes

1. Synthesize curricular concepts into patient-centered nursing practice that is appropriate for diverse individuals, families, and communities.
2. Synthesize the evidence base into nursing care of patients across the lifespan.
3. Evaluate leadership principles that integrate the application of health care policies and standards.
4. Evaluate effectiveness of interprofessional collaboration in the delivery of health care for quality patient outcomes.
5. Evaluate technologies for the management of information and in the delivery of patient care.

NMNC 4520. Professional Nursing Concepts II**3 Credits (3)**

This course covers policy concepts for professional nursing. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.

Corequisite: NMNC 4510, NMNC 4535, NMNC 4545.

Learning Outcomes

1. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
2. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
3. Synthesize care delivery concepts to improve quality patient outcomes and professional nursing practice.
4. Analyze impact of health care delivery systems on patient care outcomes.
5. Compare and contrast health care policies and evidence-based practice.

NMNC 4535. Clinical Intensive III**4 Credits (4)**

The focus of this clinical course is application of the curricular concepts in the management of care participants with complex conditions across the lifespan. Same as NMNEC course no.: NMNEC503. Restricted to: BSN, BSNP, BSNR, NURS majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.

Corequisite: NMNC 4510, NMNC 4520, NMNC 4545.

Learning Outcomes

1. Integrate diverse patient values into plan of care for patients with complex illness.
2. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
3. Integrate an evidence-based approach in the delivery and evaluation of nursing care to patients with complex illness across the lifespan.
4. Evaluate the use of policies and procedures within the complex care setting.
5. Effectively collaborate with the health care team in the delivery of patient care.
6. Integrate use of appropriate technology for the delivery of nursing care to patients with complex illness.

NMNC 4545. BSN Capstone**4 Credits (4)**

The synthesis, integration, and application of concepts to professional nursing practice will be applied in the final clinical course to ensure readiness to enter practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: Successful completion of all previous nursing courses.

Corequisite: NMNC 4510, NMNC 4520, NMNC 4535.

Learning Outcomes

1. Synthesize and integrate nursing practice concepts into their professional nursing practice.
2. Engage in professional nursing practice that is patient-centered and appropriate for diverse individual, families, and communities.
3. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
4. Deliver nursing care that is evidence-based.
5. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
6. Engage in effective interprofessional collaboration in the delivery of health care for quality patient outcomes.
7. Utilize technologies for the management of information and in the delivery of patient care.

Nursing Courses

NURS 1110. Pre-Nursing Freshman Seminar**1 Credit (1)**

This Freshman seminar provides an introduction to the university and its resources, an orientation to the pre-nursing curriculum, and overview of concepts for professional nursing practice. Emphasis is placed on exploring the nurse's role as an integral member of the healthcare team across multiple contexts and settings, and developing a professional identity. Consent of Instructor required.

Learning Outcomes

1. Develop strategies for transitioning to university life and a pathway to the nursing program, through evaluating knowledge, skill, and experience strengths and deficits.
2. Understand the role nurses and other interprofessional partners play in addressing issues regarding the patient experience across multiple healthcare settings.
3. Identify and examine cultural, professional and personal beliefs and values of nurses as they relate to patient care and working in multidisciplinary teams.
4. Begin to explore nursing careers in a variety of healthcare settings, across the nation.

NURS 120. Introduction to Pharmacology**3 Credits (3)**

General principles of pharmacology including methods of administration, effect on the body, interactions with other drugs, and classification of drugs. Focus on the health care provider's role in safe pharmacologic intervention. May be repeated up to 3 credits. Crosslisted with: HIT 120. Restricted to Community Colleges campuses only.

NURS 127. Medication & Dosage Calculation**2 Credits (2)**

General principles of medication administration including computation of medication dosage, preparation, safe administration, and documentation of multiple forms of drugs. Includes instruction on various systems of measurement. Applies critical thinking in the administration of oral, topical, enteral, and parenteral medications. Restricted to: Nursing and Medical Assisting Majors. May be repeated up to 2 credits.

Learning Outcomes

1. The student will demonstrate accurate dosage calculation; discuss the principles of medication administration, identify the classification of drugs used for various disorders of the systems, administration safety and identify the elements of accurate documentation of medication administration.

NURS 130. Foundations of Pharmacology**3 Credits (3)**

This course provides the nursing student with an introduction to the foundations of pharmacology including: science of drug action, principles of medication administration, accurate calculation of drug doses, medication therapy across the lifespan, application of medications to treat health alterations, normal and adverse responses by the client to medication therapy, medication safety, medication regulation, national patient safety goals, and appropriate nursing interventions to achieve the desired goals of medication therapy. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to pharmacological therapy as measured by: a. Recognize the influence of values, preferences, and expressed needs on the administration of pharmacotherapeutics to populations across the lifespan; b. Explain the nurse's professional role related to pharmacotherapeutics in diverse populations across the lifespan
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly related to adverse or side effects of pharmacological therapy throughout the lifespan as measured by: a. Identify methods for communication with the health care team related to pharmacotherapeutics; b. Explain how members of the health care team collaborate in the delivery of pharmacotherapeutics
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes related to the administration of pharmacological therapy as measured by: a. Apply evidence-based information to the administration of pharmacotherapeutics
4. Demonstrate adherence to policies, procedures, and standards of care for the administration of pharmacological therapy in healthcare delivery systems as measured by: a. Give examples of policies, procedures, and standards of care related to selected medication administration topics
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care as measured by: a. Give examples of policies, procedures, and standards of care related to selected medication administration topics; b. Give examples of common classes of drugs that are used in health care and their related pharmacokinetics, pharmacodynamics, and pharmacotherapeutics
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for the administration of pharmacological therapy across the lifespan as measured by: a. Discuss available technology for delivery of nursing care related to pharmacotherapeutics

NURS 134. Foundation of Nursing Skills and Assessment**3 Credits (1+6P)**

This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan. Students must be admitted into the Nursing Program to enroll in this course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness as measured by: a. Describe modifications to nursing care based on client cultural and religious influences; b. Demonstrate physical assessment skills for clients across the lifespan utilizing appropriate equipment and techniques.
2. Describe scopes of practice, roles and values of health care team members as measured by: Identify independent and collaborative nursing interventions.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan as measured by: a. Demonstrate safe performance of basic nursing procedures; b. Identify quality sources of information to verify skills and interventions are based on evidence.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care as measured by: Identify need/situation where reporting of incident/event/irregular occurrence/variance is appropriate.
5. Describe strategies that reduce the risk of harm to self and others as measured by: a. Identify methods utilized to provide safe and effective care; b. Identify and document changes in patient status.
6. Identify essential information that must be available in a common database to support patient care across the lifespan as measured by: a. Select standard technology utilized to provide basic care to clients across the lifespan; b. Identify approved abbreviations and standard terminology for documenting care.

NURS 136. Foundations of Nursing Practice**6 Credits (4+6P)**

This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and foundational nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in the simulation lab, long-term care, the community, and rehabilitation settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of one adult client and to develop care planning skills related to actual problems. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness as measured by: a. Identify personal values, beliefs, and attitudes about health and wellness; b. Define health protection, health promotion, and disease prevention; c. Describe the basic principles of the teaching/learning process.
2. Describe scopes of practice, roles and values of health care team members as measured by: a. Describe roles/responsibilities, scope of practice and values of health care team members; b. Identify principles of delegation to other members of the healthcare team.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan as measured by: a. Describe EBP to include components of research evidence, clinical expertise, and patient/family values; b. Describe standards and regulations that apply to nursing and ethical practice.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care as measured by: Identify sources of information regarding national standards or policies regarding patient care across the lifespan.
5. Describe strategies that reduce the risk of harm to self and others as measured by: a. Define patient safety and quality of care; b. Describe methods to identify, report variances, and reduce risk of harm in provision of professional nursing care.
6. Identify essential information that must be available in a common database to support patient care across the lifespan as measured by: a. Identify quality sources of information and communication techniques designed to mitigate error and protect confidentiality of protected health information across the lifespan.

NURS 137. Care of Geriatric Patient**3 Credits (3)**

This course will introduce the nursing student to foundational concepts of age-appropriate/specific care of the older adult who represents the largest population of individuals placing demands on the healthcare system. It includes basic and complex concepts and issues related to care of the older client across the care continuum, provision of cost-effective care in a resource sparse environment. Students must be admitted into the nursing program to enroll in this course. Restricted to: NURS majors. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by older adults related to chronic illness and age-related changes, as well as their preferences and expressed needs as measured by: a. Give examples of cultural, religious, socioeconomic, environmental, and internal influences on the health and illness of an older adult; b. Select health protection, health promotion, and disease prevention strategies related to care of older adults; c. Relate own beliefs and attitudes related to aging that might impact ability to provide care to the older adult.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of older adults with commonly occurring chronic illness or age-related changes as measured by: a. Locate care delivery settings and sources for referral and coordination of healthcare needs for older adults.
3. Compare an individualized patient care plan utilizing an evidence-based approach for older adults to outcomes related to the administration of pharmacological therapy as measured by: a. Describe sources of information regarding evidenced-based protocols for care of older adults; b. Use principles of ethical practice in delivery of care to the older adult.
4. Demonstrate adherence to policies, procedures, and standards of care related to the provision of professional nursing care of older adults with chronic diseases as measured by: a. Give examples of healthcare policies and national standards of care related to the provision of care to older adults.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care pertinent to the provision of care to older adults: a. Recognize potential and actual safety issues that are pertinent to the provision of care to older adults; b. Apply nursing interventions that reduce risk of harm to older adults.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care to support care of older adults as measured by: a. Discuss issues with use of technology related to the care of older adults; b. Discuss essential information that needs to be in a common database relevant to care of the older adult.

NURS 140. Pathophysiology for Allied Health Professionals**3 Credits (3)**

Introduction to the nature of disease and its effect on body systems. Deals with the disease processes affecting the human body via an integrated approach to specific disease entities. Includes a review of normal functions of the appropriate body systems. Diseases are studied in relationship to their etiology, pathology, physical signs and symptoms, diagnostic procedures, complication, treatment modalities, and prognosis. Restricted to Allied Health and Health Information Technology majors. Restricted to: Community Colleges only.

NURS 144. Pharmacology, Essentials of Medication Safety
2 Credits (2)

This course introduces the nursing student to pharmacological nursing practice across the lifespan. The student identifies the nurse's professional role related to pharmacotherapeutics in diverse populations. Safety issues and minimization of risk potential associated with pharmacotherapeutics, complementary, and alternative medicines are discussed. Health care system protocols, communication methods, and informatics related to pharmacotherapeutics are included in the course content. Common drug classes and the pharmacotherapeutics, pharmacodynamics, and pharmacotherapeutics associated with each class are included in this course. Restricted to NURS Majors.

Prerequisite: NURS 127.

Learning Outcomes

1. Discuss drug classifications including the uses, actions, pharmacodynamics, indications, pharmacokinetics, contraindications, adverse effects, and nursing implications.
2. Provide patient with education regarding a newly prescribed medication.

NURS 146. Common Health Deviations
6 Credits (4+6P)

Common health deviations and the manner by which they alter various body functions are explored. The role of the licensed practical nurse in assisting clients with common health deviations is presented. Ethical and legal implications and the role of the practical nurse are also considered. The licensed practical nursing student will utilize the application of knowledge to client care situation both in the subacute and acute care settings. The nursing process is presented as guide for coordinating client care. Grade of C or better. Restricted to: NURSING majors. May be repeated up to 6 credits.

Prerequisite: (NURS 127 or NURS 153), NURS 156, NURS 154, NURS 157, and NURS 210 OR consent of program director.

Learning Outcomes

1. Utilize critical thinking and systematic problem-solving process as a framework for providing care for adult patients in structured health care setting with complex health care needs.
2. Utilize critical thinking and problem solving skills in prioritizing the management and coordination of all aspects of care.

NURS 147. Adult Health I
6 Credits (4+6P)

This course focuses on application of the nursing process and theoretical concepts of care for adults with commonly occurring health problems. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to continue development of: prioritization skills, proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one adult client. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to Community Colleges campuses only. May be repeated up to 6 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness as measured by: a. Give examples of how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their care related to selected course topics for adult clients with chronic and acute illness; b. Select health protection, health promotion, and disease prevention strategies related to selected course topics for adult clients; c. Relate the scope, risk factors, physiologic processes, attributes, and clinical management of chronic disease to selected course topics for adult clients.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan as measured by: a. Locate significant information to report to other disciplines; b. Select resources for continuity of patient care related to selected topics; c. Apply the principles of delegation to selected course topics.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s) as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics; b. Use principles of ethical practice in the delivery of nursing care for patients with chronic or acute illness.
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems as measured by: a. Give examples of policies, procedures, and standards of care related to selected course topics.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care as measured by: a. Identify variations in physiologic integrity related to selected course topics; b. Apply nursing interventions to reduce risk of harm related to selected course topics.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan as measured by: a. Discuss available technology for delivery of nursing care related to selected topics.

NURS 149. Mental Health Nursing**3 Credits (2+3P)**

This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to develop ability to develop: proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one client across the life span with acute/chronic mental health needs. Students must be concurrently enrolled in both the lecture and lab sections of this course. Students must be admitted into the Nursing Program in order to enroll in the course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness as measured by: a. Give examples of how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their health care related to selected mental illness topics across the lifespan; b. Select health protection, health promotion, and disease prevention strategies related to selected course topics; c. Relate the scope, risk factors, physiologic processes, attributes, and clinical management related to selected mental illness topics across the lifespan.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan as measured by: a. Locate significant information to report to other disciplines; b. Select resources that provide continuity of care related to selected course topics; c. Apply the principles of delegation to selected course topics.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s) as measured by: a. Implement individualized patient care utilizing an evidence-based approach for patients with chronic or acute mental illness; b. Describe the principles of ethical practice in the delivery of nursing care for patients with chronic or acute mental illness.
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems as measured by: a. Give examples of policies, procedures, and standards of care related to selected course topics.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care as measured by: a. Identify variations in psychosocial integrity related to selected course topics; b. Apply nursing interventions to reduce risk of harm related to selected course topics.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan as measured by: a. Discuss available technology for delivery of nursing care related to selected mental health topics.

NURS 150. Medical Terminology**3 Credits (3)**

Understanding of the basic elements of medical words. Use of medical abbreviations. Same as OEHO 120 and BOT 150. May be repeated up to 3 credits. Crosslisted with: BOT 150, AHS 120 and HIT 150.

NURS 153. Medication and Dosage Calculation**1 Credit (1)**

Techniques of dosage calculation for medication and fluid administration. RR applicable. Students must meet NMSU basic skills requirement in mathematics to enroll in this course.

Corequisite(s): NURS 156 and NURS 154.

NURS 154. Physical Assessment**2 Credits (2)**

Beginning techniques of physical assessment by systems will be presented using the nursing process as a guide for providing safe client centered care throughout the life span. Grade of C or better is required. Restricted to Nursing Majors. Restricted to Dona Ana Campus. May be repeated up to 2 credits.

Prerequisite: BIOL 1130 or BIOL 2210.

Corequisite: NURS 127, NURS 156.

Learning Outcomes

1. The student will demonstrate a systematic (head to toe) physical assessment to gather objective data
2. The student will explain the characteristics of growth and development of individuals throughout the lifespan
3. The student will obtain a thorough health history to gather subjective data

NURS 155. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes.

NURS 156. Basic Nursing Theory and Practice**6 Credits (4+6P)**

Introduction to the nursing profession and the beginning skills of nursing practice as it relates to normalcy. The nursing process is presented as a means of guiding the student in providing safe client centered care. Ethical and legal aspects of nursing practice are also included. Basic clinical nursing skills will be presented and practiced in the nursing lab. The student will perform these skills with clients in an actual health care setting. Consent of Program Director requires. Restricted to: NURSING majors. Restricted to Dona Ana campus. May be repeated up to 6 credits.

Corequisite: NURS 154.

Learning Outcomes

1. Use evidence-based practice, critical thinking, and scientific rationales to plan safe care for adults who are experiencing alterations in health.
2. Utilize knowledge and concepts from the arts, sciences, and humanities to plan nursing care to enhance individual patient's health outcomes and quality of life.
3. Respect patients' unique responses to health and illness based on socio-cultural and physical environments.
4. Explore basic concepts of a community continuum of care, including the professional roles of interdisciplinary teams, community resource agencies, and family support systems.

NURS 157. Maternal/Child Health Deviations**8 Credits (6+6P)**

This course introduces the student to the concepts and principles of nursing care of the family from conception to adolescence. Utilizing the assessment, analyzing, planning, and implementation phases of the nursing process (the Care map), the student focuses on the supportive-educative nursing system to assist members of the family in meeting self-care requisites and how they are affected by the health deviations common to each developmental level beginning with conception and ending with adolescence. Knowledge gained in theoretical instruction is then applied to the patient care situation. After an introduction to the necessary clinical skills in the campus laboratory setting, students will participate in clinical experiences with the focus on the family from conception to adolescence. The assessment, analysis, planning, and implementation phases of the nursing process are emphasized as a tool to assist patients in meeting universal and developmental self-care requisites. Utilizing the nursing process, the student provides safe, client-centered care to diverse clients and families. Theoretical instruction is applied to client care situations. Students collaborate with clients, families, and the interdisciplinary team in meeting health care needs. Experiences may occur in the physician's office, local health department, day care centers, schools, or the hospital. Grade of C or better required. Restricted to: NURSING majors. Restricted to Carlsbad campus only.

Prerequisite: NURS 156, NURS 153, and NURS 154.

Corequisite: NURS 210.

Learning Outcomes

1. Determine how values of clients, families and medical personnel impact the involvement of clients in their health care related to maternal/child and pediatric clients.
2. Implement individualized client care utilizing an evidenced based approach related to maternal/child and pediatric clients.
3. Choose health protection, health promotion, and disease prevention strategies in the care of maternal/child and pediatric clients.
4. Apply the scope, risk factors, physiologic processes, and clinical management strategies to maternal/child and pediatric clients.
5. Choose resources for continuity of client care related to maternal/child and pediatric clients.
6. Give examples of significant information to report to other disciplines.
7. Apply the principles of delegation in the provision of client care with maternal/child and pediatric clients.
8. Utilize evidenced based information to implement a plan of care and employ nursing interventions for maternal/child and pediatric clients.
9. Use the principles of ethical practice in the delivery of nursing care for maternal/child and pediatric clients. 1
10. Apply policies, procedures and standards of care related to maternal/child and pediatrics in the provision of client care. 1
11. Apply nursing interventions to reduce risk of harm to self and others related to maternal/child and pediatric clients. 1
12. Choose available technology for delivery of nursing care related to maternal/child and pediatric clients.

NURS 201. Special Topics**3 Credits (3)**

Specific topics NCLEX course will help prepare students for the predictability exam and NCLEXRN. This course assists students in being emotionally, didactically and technically prepared to take both examinations. Students will review how to prepare to take this examination through a series of sample tests, quizzes and group discussions. A variety of core content subject matter will be covered to allow the student to be prepared to take the comprehensive examinations. At the conclusion of this course, the student will take a comprehensive predictability exam. Students must be admitted into the Nursing Program to enroll in this course. May be repeated up to 10 credits.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for acute and chronically ill patients through application to NCLEX style questions as measured by: a. Integrate the scope, risk factors, physiologic processes, and attributes of health, wellness, chronic, and acute disease into the clinical management of patients across the lifespan; b. Evaluate how values of patients, families, and medical personnel impacts the health, wellness, and illness of patients across the lifespan.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations through application to NCLEX style questions as measured by: a. Evaluate ability to apply the principles of delegation and prioritize care in patient-based scenarios across the lifespan; b. Evaluate ability to select appropriate resources for continuity of patient care across the lifespan.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan through application to NCLEX style questions as measured by: a. Evaluate ability to apply evidence-based approaches to the provision of patient care across the lifespan.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care through application to NCLEX style questions as measured by a. Evaluate ability to formulate a plan of care for provision of care in patient-based scenarios utilizing policies, procedures, and standards of care.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures through application to NCLEX style questions as measured by: a. Evaluate ability to effectively utilize strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan through application to NCLEX style questions as measured by: a. Evaluate ability to utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan.

NURS 209. Independent Study**1-4 Credits**

Individual studies to meet identified student needs. May be repeated for a maximum of 10 credits. Restricted to: Community Colleges only.

Prerequisite: admission to the nursing program.

NURS 210. Pharmacological Requisites of the Childbearing Family**1 Credit (1)**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care will be discussed focusing on medications commonly utilized with the childbearing family. Medication classes to be discussed include labor and delivery, analgesic, vitamins, respiratory, gynecological, endocrine, and anti-microbial/anti-infective drugs. Grade of C or better required.

Prerequisite(s): NURS 153, NURS 154 and NURS 156.

Corequisite(s): NURS 157.

Learning Outcomes

1. Effective communication skills in reading, writing, listening, and speaking.
2. Basic critical thinking skills including problem identification, evidence acquisition, evidence evaluation, and reasoning/conclusion.
3. An understanding of personal and social responsibility.
4. An ability to apply the fundamental concepts of quantitative reasoning in mathematics and science.
5. Appropriate information and digital literacy, and skills for personal and professional use.

NURS 211. Pharmacological Requisites of Simple Health Deviations**1 Credit (1)**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care are addressed focusing on medications related to the psychiatric, gastrointestinal, musculoskeletal, gynecological, hematological, and anti-neoplastic client. Grade of C or better required. Restricted to: Carlsbad campus only.

Prerequisite(s): BIOL 2210 and BIOL 2225 and NURS 153, NURS 154, NURS 156, NURS 157 and NURS 210.

Corequisite(s): NURS 246 and NURS 258.

NURS 212. Pharmacological Requisites of Complex Health Deviations**1 Credit (1)**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care is examined focusing on medications related to complex health deviations. Drug classes to be discussed include cardiovascular, renal, endocrine, and neurological. Grade of C or better required.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 246, NURS 258, NURS 210 and NURS 211.

Corequisite(s): NURS 256 and NURS 260.

Learning Outcomes

1. Apply principles of teaching/learning in educating clients on the use, adverse effects and interactions of pharmacotherapeutic agents used to treat complex health deviations.
2. Collaborate with members of the health care team in the delivery of pharmacotherapeutics to clients with complex health deviations.
3. Give examples of commonly prescribed drugs used to treat clients with complex health deviations and related pharmacokinetics and pharmacodynamics.
4. Discuss the relationship between the use of pharmacotherapeutics and the treatment of disease in clients with complex health deviations.
5. Identify safety issues and minimize risk potential associated with pharmacotherapeutics.

NURS 224. Maternal Child Nursing**5 Credits (4+3P)**

This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation lab, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 5 credits.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Determine how values of patients, families, and medical personnel impacts the involvement of patients in their health care related to selected course topics for maternal/child clients; b. Choose health protection, health promotion, and disease prevention strategies related to selected course topics for maternal/child clients; c. Apply the scope, risk factors, physiologic processes, attributes, and clinical management related to selected maternal/child and pediatrics topics.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as it relates to the child bearing woman (19-65 years) and pediatrics as measured by: a. Choose resources for continuity of patient care related to selected topics; b. Apply the principles of delegation to selected course topics; c. Give examples of significant information to report to other disciplines.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics; b. Use the principles of ethical practice in the delivery of nursing care for maternal/child patients.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Apply policies, procedures, and standards of care related to selected course topics for maternal/child clients.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Interpret variations in psychosocial integrity related to selected course topics for maternal/child clients; b. Apply nursing interventions reduce risk of harm to self and others related to selected course topics.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Choose available technology for delivery of nursing care related to selected maternal/child clients.

NURS 226. Adult Health II**6 Credits (4+6P)**

This course focuses on application of nursing process and theoretical concepts of care for adults with complex health alterations. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to apply: prioritization skills, maintain proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, and care planning skills related to patient actual, psychosocial, and potential problems in the delivery of nursing care to meet needs of three adult clients. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the adult client with acute illness as measured by: a. Determine how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their care related to selected course topics for adult clients with acute illness; b. Choose health protection, health promotion, and disease prevention strategies related to selected course topics for adult clients; c. Apply the scope, risk factors, physiologic processes, attributes, and clinical management of acute disease to selected course topics for adult clients.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to adult clients with acute illness as measured by: a. Choose resources for continuity of patient care related to selected topics; b. Apply the principles of delegation to selected course topics; c. Give examples of significant information to report to other disciplines.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to adult clients with acute illness as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics; b. Use principles of ethical practice in the delivery of nursing care for adult patients with acute illness.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to adult clients with acute illness as measured by: a. Apply policies, procedures, and standards of care related to selected course topics.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to adult clients with acute illness as measured by: a. Interpret variations in physiologic integrity related to selected course topics; b. Apply nursing interventions to reduce risk of harm to self and others related to selected course topics.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to adult clients with acute illness as measured by: a. Discuss available technology for delivery of nursing care related to selected topics.

NURS 235. Nursing Leadership and Management**1 Credit (1)**

This course introduces the intermediate nursing student to professional practice principles of nursing leadership and management including: health policy and politics, fiscal management & budgeting, conflict management, decision making, interdisciplinary practice, working with teams, roles in disaster planning and management, application of standards of care to risk management, organization of care delivery, health care systems, processes, and practice environments. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to Community Colleges campuses only. May be repeated up to 1 credit.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for acute and chronically ill patients as measured by: a. Discuss how personal values impacts the delivery of care to clients across the lifespan.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as measured by: a. Employ the principles of delegation to the assignment of nursing team duties and patient room assignments; b. Analyze effective communication with health care team members; c. Apply effective communication strategies in common nursing activities; d. Discuss methods to resolve conflict.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as measured by: a. Analyze personal values that influence approaches to ethical issues and decision-making; b. Describe ways in which nursing research can be used to guide nursing practice.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as measured by: a. Discuss the use of key indicators to measure performance; b. Recognize tools and processes for continuous quality improvement.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as measured by: a. Discuss ways to improve care while reducing costs; b. Incorporate an understanding of legal risks into the practice of professional nursing and recognize how to minimize risk.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as measured by: a. Discuss the necessity of using recognized taxonomies and standardized nursing languages in nursing documentation.

NURS 236. Nursing Preceptorship - Adult Health III**6 Credits (2+12P)**

This course is the final course involving care of the patient with acute or chronic illness. It focuses on care of patients with complex or multi-system problems allowing the graduating nursing student to discuss and apply all the skills learned in previous nursing courses. After successfully passing the HESI exam, students have clinical practice with preceptor in various health care settings. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to: organize care of a group of clients, maintain proficiency in performance of nursing skills, collaborate with clients, families, peers and health care team members, and support care planning skills related to patient actual, psychosocial, and potential problems in the delivery of nursing care to meet needs of the preceptors group of clients. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program and have successfully completed all level 1, 2 and 3 nursing courses may enroll in this course. Clinical may include inpatient or outpatient care, days, evenings, nights, or weekend experiences. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Learning Outcomes

1. Integrate the values, preferences, attitudes, and expressed needs of the acutely ill patient into the plan of care related to the care of the adult client with complex health deviations as measured by: a. Analyze how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their care related to selected course topics for adult clients with complex care issues; b. Evaluate health protection, health promotion, and disease prevention strategies related to selected course topics for adult clients; c. Integrate the scope, risk factors, physiologic processes, and attributes of complex acute diseases into the clinical management of these disease related to selected course topics for adult clients.
2. Integrate the contributions of other members of the healthcare team into the delivery of nursing care for individuals across the lifespan with complex or multi-system health alterations related to the care of the adult client with complex health deviations as measured by: a. Use resources for continuity of patient care related to selected topics; b. Report significant information to other disciplines.
3. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences in the creation of a plan of care for delivery and evaluation of care for patients across the lifespan related to the care of the adult client with complex health deviations as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics for multiple clients; b. Practice ethically in the delivery of nursing care for adult patients with complex care issues.
4. Evaluate the use of policies, procedures and standards of care in healthcare delivery systems and adapt the care as appropriate related to the care of the adult client with complex health deviations as measured by: a. Formulate a plan of care for the provision of care to complex patients in healthcare delivery systems using policies, procedures, and standards of care related to selected course topics.
5. Interpret and analyze effective use of strategies to reduce risk of harm to self or others while providing professional nursing care, creating a structure for implementation of evidence-based practice, national patient safety goals, and core measures in the care of the adult client with complex health deviations as measured by: a. Interpret variations in physiologic integrity related to selected course topics; b. Integrate nursing interventions to reduce risk of harm related to selected course topics including evidence-based practice, national patient safety goals, and core measures.

NURS 246. Health Deviations I**7 Credits (4+9P)**

Introduction to medical/surgical clients, whose health care needs are routine and predictable. Focus is on simple health deviations, including concepts relative to health promotion and maintenance. The nursing process is utilized to provide evidenced based, safe client centered care. Students are expected to apply clinical judgment, communicate and collaborate with clients and the interdisciplinary team in providing care for a group of two to three clients. Grade of C or better required. May be repeated up to 7 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 156, NURS 154, NURS 157 and NURS 210.

Corequisite(s): NURS 211, NURS 258.

NURS 256. Health Deviations II**8 Credits (6+12P)**

Concepts and principles applied to clients with complex health deviations. Building upon knowledge gained in NURS 246, focus will be on acutely ill clients. The nursing process continues to serve as a guide to provide safe, client centered care. The student collaborates with the interdisciplinary team in all aspects of client care. Student experiences the role of the staff nurse under the guidance and direction of the nursing instructor. Grade of C or better required. May be repeated up to 8 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 210, NURS 211, NURS 246, and NURS 258.

Corequisite(s): NURS 212, NURS 260.

Learning Outcomes

1. Apply each step of the nursing process as a method of organizing the nursing care for patients with complex health deviations.
2. Discuss the patient's health care needs that occur as a result of complex health deviations.
3. Explain methods the nurse can employ in allowing the patient to assume the right and responsibility for his own care.
4. Incorporate the concepts and principles derived from the biological, developmental, social, nutritional and computer sciences and nursing knowledge that relate to the nursing care of patients with complex health deviations.
5. Explain the roles and functions of the members of the health care team including ancillary personnel as they relate to the care of patients with complex health deviations.
6. Explain the rationale for the performance of the following technical skills: a. EKG monitoring; b. Rhythm strip interpretation; c. Hemodynamic monitoring and interpretation; d. Tracheal suctioning
7. Recognize the nurse's role in establishing a therapeutic relationship with patients experiencing complex health deviations.

NURS 258. Psychosocial Requisites: A Deficit Approach**3 Credits (2+3P)**

Nursing theory and practice as it relates to the care of the client experiencing psychosocial health deviations. The role of the nurse is discussed along with the ethical and legal aspects of care for the client with psychosocial disorders. Building upon the communication skills of listening and responding, the student develops the therapeutic skills of interpersonal relationships. Grade of C or better is required. May be repeated up to 3 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 210, and NURS 246.

Corequisite(s): NURS 211, NURS 246.

NURS 260. Management of Patients with Health Deviations**2 Credits (2)**

A capstone course to the nursing program in which principles in management and delegation to less prepared personnel is explored. A review of leadership roles, legal issues, quality initiatives, informatics and scope of practice is included. Preparation for the NCLEX is an integral portion of the course. Grade of C or better is required. May be repeated up to 2 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 210, NURS 211, NURS 246, and NURS 258.

Corequisite(s): NURS 212, NURS 256.

Learning Outcomes

1. Discuss nursing practice concepts relevant to the practice of professional nursing.
2. Evaluate principles of quality improvement and safety into nursing practice within healthcare organizations and systems.
3. Apply leadership concepts through the application of policies that apply to healthcare delivery.
4. Promote a culture of safety through anticipating and eliminating potentially harmful situations.
5. Collaborate in systems analysis when clinical errors or near misses occur to reduce harm, minimize blame, and encourage transparency.
6. Integrate evidence in determining best clinical practice.
7. Demonstrate basic knowledge of healthcare policy, finance, and regulatory environments, including local, state, national, and global healthcare trends.
8. Use an ethical framework to evaluate the impact of policies of healthcare, especially for vulnerable populations.

NURS 3110. Human Pathophysiology Foundation for Nursing**4 Credits (4)**

Human pathophysiology concepts of adaptation and alteration in function and structure across the life span and their implications for nursing practice. Restricted to: BSNR, BSN, BSNP or consent of instructor majors. May be repeated up to 4 credits.

Prerequisite: Grade of C- or better in both (BIOL 353 & BIOL 2221/BIOL 354), or (BIOL 2210 & BIOL 2225), or (SPMD 2210 & SPMD 3210).

Corequisite: NMNC 3110, NMNC 3135.

NURS 3115. Care of the Veteran Population**3 Credits (3)**

This course prepares healthcare and other professionals to care for the Veteran population. Specific topics and health issues explored include military and veteran culture, women in the military, post-traumatic stress disorder, traumatic brain injury, military sexual trauma, and chemical exposures. An overview of the Veterans Health Administration, the largest healthcare system in the USA, will be provided. May be repeated up to 3 credits.

Learning Outcomes

1. Examine Veterans' demographics and the impact of political, social, cultural, and environmental factors.
2. Analyze the mission of the Veterans Health Administration with a focus on healthcare system and services.
3. Evaluate health concerns, issues, and health seeking behaviors within the diverse Veteran population.
4. Appraise available evidence on delivering culturally sensitive care that addresses the needs of the Veteran patient and their family.

NURS 3996. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 21 credits.

Learning Outcomes

1. Varies

NURS 4110. Strategies for Student Success**3 Credits (3)**

This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors. May be repeated up to 3 credits.

NURS 4997. Independent Study**1-3 Credits (1-3)**

Individual studies with prior approval of department head. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

NURS 5110. Evidence-Based Practice for Healthcare Leaders**3 Credits (3)**

This course is designed to prepare nurse administrators and other healthcare leaders with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. May be repeated up to 3 credits.

Learning Outcomes

1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 5115. Quality Improvement for Healthcare Leaders**3 Credits (3)**

This course is designed to prepare nurse administrators and other healthcare leaders with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. Restricted to: exclude Online MSN in Nursing Administration majors.

Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of administrators in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Understand the role of health policy and national standards in guiding quality improvement initiatives.

NURS 5120. Nursing Informatics**3 Credits (3)**

This course provides the foundational knowledge necessary to integrate systems and information technologies. Topics include informatics, knowledge management, healthcare information systems/telehealth including the electronic health record. Focuses on using available technology to enhance safety and monitor the health status and outcomes of populations. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

NURS 5125. Health Policy for Advanced Nursing Practice**3 Credits (3)**

Course provides a conceptual approach to understanding health policy including the social, legal, political and ethical factors that influence policy development. Strategies for influencing policy direction and change are examined. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

NURS 5130. Promoting Health Behavior**3 Credits (3)**

Emphasis is on the role of the advanced practice nurse in facilitating health behavior change. The impact of health status on health behavior, ethical issues relate to health promotion, and the processes for promoting healthy behaviors are explored. Theoretical models of behavior change and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change. May be repeated up to 3 credits.

NURS 5210. Advanced Leadership in Healthcare**3-5 Credits (3+1-2P)**

Analysis of leadership theories as they pertain to the nurse executive and the advanced practice nurse in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Clinical component included for DNP students only. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 5 credits.

**NURS 5220. Management of Human and Fiscal Resources in Nursing
4 Credits (3+3P)**

This graduate level course examines and applies contemporary concepts of human and fiscal resource management for the nurse administrator. Focus is placed on achieving quality outcomes through effective management of human assets and organizational resources in health care settings. The course includes a clinical component. May be repeated up to 4 credits.

**NURS 5230. Seminar in Nursing Administration- Roles
3 Credits (3)**

Role preparation for the nurse administrator as manager, leader, collaborator and change agent. Synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration. May be repeated up to 3 credits.

Corequisite: NURS 5240.

**NURS 5240. Advanced Field Work in Nursing
1-3 Credits (1P)**

A practicum in Nursing Administration. Application of concepts from management and nursing to the clinical, educational, or community setting. Restricted to: MSN, DNP, PHD majors. May be repeated up to 12 credits.

Prerequisite: NURS 5210.

Corequisite: NURS 5230.

**NURS 5996. Special Topics
1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

**NURS 5997. Independent Study
1-10 Credits (1-10)**

Individual studies and directed research with prior approval of department head. May be repeated up to 20 credits.

**NURS 6110. Introduction to Population Health
1 Credit (1)**

This required course for the Doctor of Nursing Practice program prepares the student to implement specialty population-based disease prevention and health promotion activities to achieve national and international goals of improving worldwide health status. The course focuses on a spectrum of issues affecting health, which include emerging infectious diseases, emergency preparedness, disparities in health and healthcare services, and the impact of behavior and lifestyle choices on health.

Learning Outcomes

1. Analyze data to identify potential and emerging health hazards in individuals and communities.
2. Evaluate care delivery models to address disease prevention and population health.
3. Identify gaps in the care of individuals, aggregates, or populations.
4. Identify gaps in the care of individuals, aggregates, or populations.

**NURS 6120. Quality Improvement in Healthcare
3 Credits (3)**

This course prepares advanced practice nurses to be leaders of inter-professional teams engaged in the process of continuous quality improvement in healthcare settings. Healthcare quality improvement principles and practice will focus on improving patient care and outcomes, lowering costs, reducing health disparities, and increasing access to healthcare. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of the doctorally-prepared nurse in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Analyze the role of health policy and national standards in guiding quality improvement initiatives.

**NURS 6125. Evidence-Based Practice for Healthcare
3 Credits (3)**

This course is designed to prepare nurse practitioners and other advanced practice nurses with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. Restricted to: Family Nurse Practitioner; Psych/Mental Health Nursing; Nursing Practice; Family Nurse Practitioner Certificate; and Psych/Mental Health Nursing Certificate majors.

Prerequisite: NURS 6120.

Learning Outcomes

1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 6130. Epidemiology for Advanced Nursing Practice**2 Credits (2)**

Emphasis is on the practical application of the principles of epidemiology in the measurement and evaluation of population health. Epidemiological literature will be critiqued and synthesized to evaluate population-based public health nursing problems. Issues related to disease surveillance, causation, genetic patterns, screening and social trends in population health will be examined. Use of existing data bases and technology programs are covered. Restricted to: NURP, NURS, NUSC majors. May be repeated up to 2 credits.

NURS 6135. Interdisciplinary Leadership and Role Development for Practice Excellence**3 Credits (3)**

This required course prepares students for organizational and systems leadership and knowledge and skills critical to role development in independent and inter and intra-disciplinary practice. Content includes communication, conflict resolution, collaboration and negotiation, leadership, and team functioning to maximize success in the establishment of safe, effective patient-centered care in complex environments.

Learning Outcomes

1. Evaluate interdisciplinary care delivery models from a systems perspective using evidence-based findings.
2. Incorporate principles of specialty practice management, quality improvement, and interdisciplinary teamwork in order to meet the health needs of the specialty population served.
3. Analyze effective strategies for the management of ethical dilemmas, incorporation of sensitivity to diverse cultures, and elimination of health disparities incorporating appropriate communication techniques.
4. Differentiate among the multiple roles in advanced nursing practice with a focus on working effectively in inter-professional teams.
5. Evaluate leadership styles in a team environment in the analysis of complex practice and organizational issues.
6. Incorporate consultative and leadership skills with inter and intra-disciplinary teams to facilitate change using effective communication strategies.

NURS 6150. Advanced Anatomy**2 Credits (2)**

This course presents an extensive exploration of human anatomy from a topographical and regional perspective. The knowledge gained in this course serves as a foundation for advanced clinical assessment for anesthesia practice, clinical decision-making, and patient management.

Learning Outcomes

1. Describe the regional organization and topography of anatomical structures within key clinical regions of the human body with a focus on neurovascular anatomy and internal organs.
2. Describe the structure and function the central nervous system and the distribution of all of the major peripheral nerves in the body.
3. Identify the relationship between palpable anatomical landmarks and the deep anatomy of the head, neck, thorax, abdomen, pelvis and limbs.
4. Identify major anatomical structures in the human body using radiographs, ultrasound, CT, MRI images.

NURS 6155. Advanced Physiology**4 Credits (4)**

This course presents an extensive exploration of anatomy and physiology of the human body's organs and systems. Topics are covered from a molecular, cellular, tissue, organ, and system perspective. Individual differences in physiology as related to culture, gender, race, age, and genetics will also be covered. The knowledge gained in this course serves as a foundation for advanced clinical assessment, pharmacology, clinical decision-making, and patient management.

Learning Outcomes

1. Identify structures and normal physiologic functions of the human body organs and systems.
2. Demonstrate knowledge of the concept of homeostasis.
3. Summarize the complexities of normal human physiologic multi-system interactions
4. Recognize physiologic differences related to culture, gender, race, age, and genetics
5. Discuss how principles of normal physiology impact advance practice nursing care of individuals.

NURS 6210. Professional Roles for Advanced Practice Clinical Nursing**3 Credits (3)**

This course will focus on providing an in depth understanding of the legal, historical, political, social, and ethical aspects of advanced practice nursing. Traditional and emerging roles for advanced practice nursing are examined. Students must be Admitted to the DNP program. Restricted to DNP majors. May be repeated up to 3 credits.

Prerequisite: NURS 6430 OR NURS 6520.

NURS 6215. Professional Aspects of Nurse Anesthesiology Practice**3 Credits (3)**

This course examines professional role development of the nurse anesthetist with an emphasis on the history and evolution of nurse anesthesiology practice, as well as scope, standards, legal aspects, ethics, quality, and regulations. Professional advocacy topics and the business of anesthesiology practice will be appraised. This course also addresses the risks of the role related to wellness and substance use disorder. Cultural competence modules for healthcare workers will be completed during this course.

Learning Outcomes

1. Discuss the history and evolution of nurse anesthesiology practice.
2. Analyze the professional components of nurse anesthesiology practice, emphasizing scope, standards, legal aspects, ethics, and regulation.
3. Differentiate between state, national, and international anesthesia organization roles and functions.
4. Identify quality assessment tools in anesthesiology practice.
5. Compare various business models of anesthesia, reimbursement methods, payment policies, reimbursement, and nurse anesthesiology practice patterns.
6. Examine the impact of wellness and substance use disorder on anesthesia providers.
7. Demonstrate cultural awareness and sensitivity of patient background characteristics including, but not limited to race, ethnicity, socioeconomic status, age, gender and sexuality.
8. Examine professional advocacy and other selected current issues affecting nurse anesthesiology practice.

NURS 6220. Advanced Pathophysiology for Clinical Nursing
3 Credits (3)

In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

NURS 6224. Diagnostic Reasoning and Advanced Health Assessment
3 Credits (3)

This course is designed to assist students to refine history taking, psychosocial assessment and physical assessment skills. Content focuses on assessment of individuals throughout the lifespan. Emphasis is placed on detailed health history taking, differentiation, interpretation and documentation of normal and abnormal findings. Diagnostic reasoning skills are emphasized as students develop processes to formulate differential diagnoses for acute and chronic physical and mental illnesses in the primary care setting across the lifespan.

Prerequisite: NURS 6235.

Learning Outcomes

1. Analyze and use the most effective communication methods to obtain a health history and to develop a therapeutic relationship.
2. Differentiate variations in normal and abnormal health and physical data.
3. Explore processes of diagnostic reasoning and potential cognitive biases.
4. Using data from the health and physical assessment, formulate differential diagnoses for given physical and mental illnesses across the lifespan.
5. Demonstrate advanced clinical judgment by using data from the health and physical assessment to design and implement clinically safe and patient-focused interventions.

NURS 6226. Advanced Health Assessment Practicum
1 Credit (1P)

Assessment skills for advanced clinical practice. Emphasis on assessment of patients across the life span. May be repeated up to 3 credits.

Corequisite: NURS 6225.

Learning Outcomes

1. Conduct a comprehensive and systematic assessment of health and illness in complex situations.
2. Collect and interpret health data related to the health history, chief complaint, and history of the present illness.
3. Use effective communication methods to obtain a health history and to develop a therapeutic relationship
4. Assess variations in normal and abnormal health and physical data.
5. Document advanced clinical judgment by using data from the health and physical assessment to determine a health status.

NURS 6230. Advanced Clinical Pharmacology
3 Credits (3)

Principles of clinical pharmacology for advanced clinical practice. Focus on pharmacology as it relates to human physiology and pathophysiology across the lifespan. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

NURS 6235. Advanced Pathophysiology for Nurse Anesthesiology Practice

4 Credits (4)

This course focuses on pathophysiology of diseases relevant to nurse anesthesiology practice. Evidence-based practice resulting from relevant research will be incorporated in discussions related to anesthesia management of patients with health status alterations. Students will utilize this information to build a foundation for anesthesia clinical reasoning and principles of nurse anesthesiology practice.

Learning Outcomes

1. Analyze the relationship between normal physiology and pathologic consequences produced by selected disease states.
2. Demonstrate understanding of selected biochemical, genetic, and cellular mechanisms that lead to common health alterations that occur in individuals across the lifespan.
3. Identify various pathologic alterations relevant to anesthesia practice.
4. Integrate the clinical application of pathophysiology into the practice of nurse anesthesiology.
5. Discuss the relationship between pathophysiology of various systems and anesthesia planning and management.

NURS 6240. Advanced Health Assessment for Nurse Anesthesiology Practice

3 Credits (3)

This course focuses on development of knowledge and skills necessary to conduct comprehensive and focused health assessments for patients across the lifespan with special attention given to nurse anesthesiology practice. Principles of conducting detailed health histories, physical examinations, and diagnostic study interpretations will be featured. Students will obtain and document detailed culturally sensitive health histories and physical examinations. They will use critical thinking to identify and/or interpret pertinent diagnostic studies related to alterations in health patterns. Emphasis is placed on differentiation between normal and abnormal health history, physical assessment, and diagnostic findings.

Learning Outcomes

1. Demonstrate a systematic approach to the collection and documentation of data for health history and physical assessment while maintaining confidentiality and respecting privacy.
2. Collect and interpret health data related to the health history, history of the present illness, laboratory and other diagnostic findings.
3. Document relevant findings for both comprehensive and focused health histories and physical assessments.
4. Identify potential anesthesia risks based on patient health history, physical exam findings, and current literature.
5. Conduct and document a comprehensive preanesthesia evaluation to include health and surgical history, physical examination, and interpretation of diagnostic data using effective communication while maintaining confidentiality and respecting privacy.

**NURS 6245. Advanced Pharmacology for Nurse Anesthesiology Practice
3 Credits (3)**

This course builds upon the advanced clinical pharmacology course and is designed to provide an evidence-based in-depth foundation of pharmacology and its application to anesthesiology practice across the lifespan. The primary focus will be on topics such as pharmacodynamics, pharmacokinetics, pharmacotherapeutics, pharmacy, and toxicology of currently used anesthetic agents

Learning Outcomes

1. Identify general pharmacokinetic, pharmacodynamic, pharmacogenetic, and pharmacotherapeutic principles related to anesthetic agents and adjunct drugs
2. Discuss the uptake and distribution of primary anesthetic agents and adjunct drugs.
3. Summarize indications/contraindications for selected anesthetic agents and adjunct drugs.
4. Calculate accurate doses of selected anesthetic agents and adjunct drugs.
5. Review potential adverse effects and drug interactions of selected anesthetic agents and adjunct drugs.
6. Describe evidence-based anesthetic considerations of anesthetic agents and adjunct drugs used for various procedures and various patients across the lifespan with diverse comorbidities and demographics.

**NURS 6250. Healthcare Policy and Ethics
3 Credits (3)**

This course examines complex challenges faced in the US healthcare system for nurses in advanced practice roles within an ethical framework. Ethical, social, and political issues that affect the provision of health care, communities, and society are critically analyzed with an emphasis on interprofessional roles in health care. Concepts that support advocating for social justice, reducing healthcare disparities, improving quality, promoting ethical aspects of care, and cost containment are overarching themes in the course discussions and assignments. Students use self-reflection, case studies and presentations to apply ethical principles, develop healthcare policy recommendations to improve care access, and reduce disparities in professional practice and population health.

Learning Outcomes

1. Analyze the historical evolution of health care systems and their influence on the development of institutional, local, state, federal and international health policy.
2. Critique socioeconomic, legal, ethical, and political issues relevant to policymaking and provision of equitable, safe, and quality health care at the local, state, and national levels.
3. Assess health policies, infrastructure, financing, and complex systems in the US in contrast to other nations.
4. Critically analyze bioethical issues in clinical practice settings as they impact policy, disparities, advocacy, ethics, improved patient outcomes and reduced costs.
5. Synthesize the principle of human rights and ethics in conduct of health care research and policy design.
6. Interpret the value and importance of advanced practice nursing role(s) to policy makers, health care professionals, and consumers.

**NURS 6255. Innovations and Health Care Organizations
3 Credits (3)**

Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

**NURS 6260. Population Health and the Environment
3 Credits (3)**

This course will examine and evaluate prevention strategies, healthcare quality measures, diversity principles, and patient safety considerations related to population health. There is a focus on how environmental health can be integrated into nursing education, practice, research, and policy/advocacy efforts. Students will explore community, environmental, cultural, and socioeconomic dimensions of care as evidenced by completion of a community assessment.

Prerequisite: NURS 6110.

Learning Outcomes

1. Analyze theoretical frameworks/conceptual models for relevance to population health.
2. Analyze the impact of a population health focus on the health of individuals, families and communities.
3. Differentiate the impact of biologic factors, the natural environment, built environment and altered environment on health.
4. Describe the impact of discrimination, sexism, and racism on equity and inclusion in healthcare and on health.
5. Analyze the relationship between human health, animal health and ecosystem health.
6. Apply the principles of patient and community engagement for population health improvement
7. Discriminate between population growth, health and development as factors in global health.
8. Examine institutional, local/state/federal, and global policies that address the relationship between population health and the environment.

NURS 6265. Strategic and Financial Planning for Population Health Programs**3 Credits (3)**

This course explores the role of nurses in advanced nursing practice within a rapidly changing healthcare system. Theories of leadership, quality, risk outcomes, and financial structures for healthcare organizations are discussed providing a framework for change within advanced nursing practice specialties. Accounting, finance, and marketing principles are presented enabling students to complete a financial plan for an evidence based practice change.

Prerequisite: NURS 6270.

Learning Outcomes

1. Use the principles of population focused program planning, development, implementation, and evaluation to develop an evidence-based population focused strategy to address a health priority issue.
2. Analyze the potential influence of cultural, ethical, and public health policy issues when working with diverse populations.
3. Analyze aspects of organizational culture and planned change that may influence success of planned interventions.
4. Evaluate feasibility issues related to implementing planned interventions such as cost, time, and available resources.
5. Integrate principles of program evaluation to determine impact and sustainability of evidence-based interventions.
6. Analyze the impact of financial models on costs, quality and health outcomes.

NURS 6270. Clinical Data Management and Analysis**2 Credits (2)**

This required course provides students with the knowledge base to understand, collect, manage, and measure clinical data. Students will explore data collection and management processes, levels of measurement, basic statistics, and measurement for improvement in order to effectively use clinical data. Data entry exercises employed through analytical tools and statistical software packages will allow the students practice and apply the basic data management and analysis skills needed for the evaluation of clinical data and evidence-based practice.

Learning Outcomes

1. Apply principles of sound data collection and management.
2. Create a database to collect and aggregate data.
3. Apply levels of measurement.
4. Perform basic statistics including descriptive, parametric, and non-parametric statistics.
5. Perform basic analysis of aggregate population level data.
6. Use common tools (excel) and statistical software packages (SPSS) for data collection, entry, management, and analysis.

NURS 6305. Introduction to the DNP Project**1 Credit (1)**

This required course is designed to assist the student in exploring a clinical problem and selecting an area of interest within a practice specialization, and in demonstrating professional competencies related to an area of interest to begin foundational development of the DNP scholarly project. The student will document previously acquired abilities and competencies while developing an understanding of the DNP project process. Students will work towards selection of a setting (hospital, long-term, primary care or community health agency) where concepts, theories, and principles of leadership, administration, and management can be applied.

Learning Outcomes

1. Examine the role of the DNP in the development and implementation of evidence based change of practice projects.
2. Identify a DNP Project practice site and clinical advisor.
3. Develop a portfolio demonstrating expertise in the specialty area of interest and understanding of a clinical problem.

NURS 6307. DNP Project Practicum**1-3 Credits (1-3P)**

This leadership practicum courses provide for the development of a population health leader as demonstrated through the DNP project. The student will conduct an assessment of a population, community and/or organization where evidence-based leadership activities may be employed. Once a problem or issue is identified in the practice setting, the student will develop an evidence-based project designed to positively impact population-specific and/or patient care outcomes. After approval of the DNP project proposal, the student will implement an evidence-based project designed to positively impact population health and/or patient/client care outcomes. The culmination of the DNP project is evaluation and dissemination of the evidence-based changes. May be repeated up to 9 credits.

Learning Outcomes

1. Demonstrate competence in the role of population health leader who delivers advanced practice nursing, including educators, clinicians, administrators, and translators of research.
2. Execute the DNP Project that meets the needs of diverse populations
3. Collaborate with DNP committee and the organization to establish an intra- and inter-professional continuous quality improvement process for achievement of the desired outcomes
4. Exhibit consistent professional behavior, performance, accountability, and responsibility within a population health leadership role

NURS 6310. DNP Project I**1 Credit (1)**

This is the first in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this course, students will identify a problem in healthcare, explore the existing evidence and develop a preliminary proposal for a project that demonstrates synthesis of DNP coursework and lays the groundwork for future scholarship.

Prerequisite: NURS 6120 and NURS 6125.

Learning Outcomes

1. Systematically review the existing evidence pertaining to selected clinical problem, generating a written review of the existing evidence.
2. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
3. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
4. Defend the DNP project proposal in front of the student's project committee and submit to IRB

NURS 6320. DNP Project II**1 Credit (1)**

This is the second in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this course, students will have designed and defended a plan for implementation and evaluation of the proposed project, submitted an IRB application, and initiated the project upon obtaining IRB approval.

Prerequisite: NURS 6310.

Learning Outcomes

1. Execute the approved DNP project implementation and evaluation plan.
2. Develop a plan for local, regional and/or national dissemination of the DNP project outcomes as scholarly work.
3. Identify the DNP Essentials that are represented in the project and describe how the project addressed the requirement.

NURS 6330. DNP Project III**1 Credit (1)**

This is the third in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this semester, students will demonstrate the ability execute the proposed project plan. If additional time is needed to complete the proposed DNP project, the student must register for NURS 6340 in subsequent semesters until the project outcomes are successfully defended in front of the project committee.

Prerequisite: NURS 6320.

Learning Outcomes

1. Defend the DNP project outcomes in front of the student's project committee and a public audience.
2. Generate a comprehensive written paper (i.e., professional manuscript, white paper, or technical report) that outlines the DNP project problem statement, objectives, review of evidence, implementation, and outcomes.

NURS 6340. Clinical Scholarly Project**1-4 Credits (1-4)**

Building on the practice expertise of the DNP student, this series of credits is to provide the student with the opportunity to design an innovative clinical practice improvement project/program addressing an actual health care concern. Through mentored activities, the DNP student will identify, develop, implement, evaluate, and disseminate an independent analytic. Graded: S/U Grading (S/U, Audit). Students must be Admitted to the DNP program. Restricted to: NURP majors. May be repeated up to 4 credits.

NURS 6352. Integrated Care for Diverse Populations**2 Credits (2)**

This course examines integrated health care as an approach to health care delivery characterized by a high degree of collaboration and communication among health professionals. Students expand their knowledge of interprofessional competencies and learn the concepts of the development of comprehensive treatment plans to address the biological, psychological and social needs of the patient in diverse patients across care settings. The focus is on delivering behavioral or biomedical health interventions relevant to everyday clinical practice across disciplines and practice settings. There is a strong emphasis on feasible brief interventions in a fast-paced clinical context and on adapting interventions to each patient's unique biopsychosocial, socioeconomic, and cultural context.

Prerequisite: NURS 6410 or NURS 6510.

Learning Outcomes

1. Analyze the relationship between behavioral and biomedical health and cultural contexts, including an understanding of the common health/illness presentations;
2. Compare and contrast models of integrated health.
3. Develop a treatment plan for a given patient addressing the investigation and management of the patient's illness, and the personal and social issues to which the illness may give rise;
4. Identify strategies for communicating clearly and sensitively with patients and their families and with other health professionals;
5. Analyze inter-professional team members roles in collaboration and cooperation with other team members as an integral component of team function;

**NURS 6405. Psychopharmacology for Advanced Practice
3 Credits (3)**

Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education. May be repeated up to 3 credits.

**NURS 6410. PMHNP Across the Lifespan I
3 Credits (3)**

This is the first in a series of three didactic for the psychiatric mental health nurse practitioner (PMHNP) student. This course introduces the PMHNP student to the scope and standards of practice; legal and ethical issues; comprehensive psychiatric assessment and evaluation; developmental theories; and the theory and practice of psychotherapy. Emphasis is placed on individuals across the lifespan from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6411.

Learning Outcomes

1. Synthesize the current scientific evidence along with theoretical models for personality development into therapeutic interventions within a healthy environment.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems, based on current evidence and clinical practice guidelines.
4. Evaluate strategies to promote the negotiation of mutually acceptable and collaborative treatment plans.
5. Apply evidence-based findings to develop and improve practice.

**NURS 6411. PMHNP Across the Lifespan I Practicum
3 Credits (3P)**

This is the first in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides the family psychiatric nurse practitioner student opportunities to work with a preceptor to gain advanced practice skills in individual therapies, comprehensive psychiatric evaluation, personality development concepts, dual diagnoses and psychotherapy principles; including management of health promotion, health maintenance and disease prevention activities. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6410.

Learning Outcomes

1. Utilize communication skills and ethical strategies to develop and terminate therapeutic relationships.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Demonstrate knowledge of psychotherapeutic theories and concepts by independently conducting psychotherapy with individuals with mental illness or at risk for mental health problems, under the supervision of a preceptor.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems.
5. Use current evidence and clinical practice guidelines in the assessment and management of patients across the lifespan.

NURS 6420. PMHNP Across the Lifespan II**3 Credits (3)**

This is the second in a series of three didactic courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. Emphasis is placed on working with families from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6410.

Corequisite: NURS 6421.

Learning Outcomes

1. Evaluate core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Identify age appropriate theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan.

NURS 6421. PMHNP Across the Lifespan II Practicum**3-4 Credits (3-4P)**

This is the second in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. The student gains knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. The course involves working with a preceptor to develop and implement comprehensive treatment plans that include psychotherapy and psychopharmacology in inpatient and/or outpatient settings. May be repeated up to 8 credits.

Prerequisite: NURS 6411.

Corequisite: NURS 6420.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Recognize cultural diversity, spiritual preferences, values, and beliefs to create a climate of patient-centered care demonstrating confidentiality, privacy, comfort, emotional support, mutual trust, and respect.
5. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
6. Demonstrate increasing independence in the application of supportive, psychodynamic principles, cognitive-behavioral and other evidence-based psychotherapy/-ies to both brief and long-term individual encounters, family therapy and group therapy.

NURS 6430. PMHNP Across the Lifespan III**1 Credit (1)**

This third course in the series of PMHNP didactic courses provides further knowledge and skills for the psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment. Emphasis will be placed on individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 5 credits.

Prerequisite: NURS 6420.

Corequisite: NURS 6431.

Learning Outcomes

1. Synthesize current scientific evidence, differential and diagnostic reasoning along with theoretical models for group dynamics into therapeutic interventions.
2. Apply theoretical concepts, evidence-based psychotherapeutic modalities, and knowledge of psychopharmacology to develop comprehensive treatment plans for psychiatric patients across the lifespan.
3. Evaluate the role of the advanced practice nurse in the management of evidence-based interventions with groups and individuals experiencing psychosocial and neurobiological disorders.

**NURS 6431. PMHNP Across the Lifespan III Practicum
3 Credits (3P)**

This third course in the series of PMHNP clinical courses provides further knowledge and skills for the psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment of patients with mental health illness. Emphasis will be placed on psychotherapeutic and psychopharmacologic treatment of individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 6 credits.

Prerequisite: NURS 6421.

Corequisite: NURS 6430.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Independently integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and/or families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
5. Demonstrate theoretical concepts, evidence-based psychotherapeutic modalities, and knowledge of psychopharmacology to independently develop, implement and document comprehensive treatment plans.

**NURS 6432. PMHNP Across the Lifespan Residency
2 Credits (2P)**

The nurse practitioner student will be expected to fully immerse in the role of the Psychiatric Mental Health Nurse Practitioner (PMHNP) with increasing levels of autonomy, under the supervision of qualified preceptors. Students will demonstrate efficacy in practice, management, and treatment of broad types of mental health issues that present in children, adolescents, adults and/or geriatric individuals and families in a variety of settings. The student will demonstrate the ability to utilize psychopharmacological and psychotherapeutic (individual, family and group) interventions in specialty or subspecialty clinical settings, particularly those that are of clinical relevance to the student's area of intended practice. In this course, the student will demonstrate proficiency in the PMHNP role in integrated healthcare settings. Students must complete psychiatric mental health clinical rotation hours treating patients across the lifespan while offering opportunities for board certification exam preparation. Restricted to Nursing majors. May be repeated up to 4 credits.

Prerequisite: NURS 6421.

Corequisite: NURS 6431.

Learning Outcomes

1. Fully integrate the mental health nurse practitioner role in the implementation of practice in diverse practice settings.
2. Provide high quality, safe, cost-effective, patient centered care recognizing cultural diversity and the patient or designee as a full partner in decision-making.
3. Appropriately diagnose, manage, and develop treatment plans for patients experiencing mental health care problems, to maximize the patient's health potential using psychosocial, psychopharmacologic and psychotherapeutic interventions.
4. Demonstrate the highest level of accountability for ethical professional practice.
5. Evaluate patient outcomes and responses, and modify the patient plan of care accordingly.
6. Participate in opportunities for board certification exam preparation

NURS 6450. Advanced Concepts in the Treatment of Substance Use Disorders**1 Credit (1)**

This course examines scope of practice, epidemiology, cultural issues, and common co-occurring psychiatric, medical and legal problems related to substance use disorders, including opioid use disorder. Students will review theories and research as the basis for psychometric screening and evidence-based interventions, including medication-assisted treatment for substance use disorders. Emphasis is placed on individuals across the lifespan from diverse populations. Consent of Instructor required.

Learning Outcomes

1. Demonstrate the significance of professionalism and self-awareness by maintaining professional, ethical and legal standards, preserving the integrity of the therapeutic process, demonstrating commitment to the health and well-being of individuals and society ethical practice, and upholding high personal standards of behavior.
2. Recognize addictive disorders as developmental biopsychosocial disorders using a model of interconnection encompassing neurobiology, genetic, medical and mental health co-morbidities, familial, social, environmental, cultural, spiritual influences as contributors of substance use disorders.
3. Apply an evidence-based approach to detecting substance use disorders by recognizing medical, psychological, social, and functional indicators of subclinical addiction disorders through use of validated standardized substance use disorder screening instruments, and accurately interpret screening results indicative of hazardous and harmful substance use. Integrate positive substance use screening results with therapeutic and counseling strategies appropriate to the patient's readiness to change, by assessing the patient's background, ethnicity, and belief system to accommodate and respect the values and attitudes of various cultures.
4. Recognize the indications, contraindications, duration and utilization of evidence-based medication-assisted treatment and pharmacotherapy for substance use disorders including medications for acute withdrawal and relapse prevention.
5. Diagnose substance use disorders and existing co-occurring mental health and/or medical disorders, and match appropriate level of care, secure consultation and referrals for specialty treatment of addiction and other medical and psychiatric conditions.

NURS 6506. Health Needs of Women and Children**3 Credits (3)**

The course will examine patient and family perspectives as well as health care system variables and societal issues affecting the organization and delivery of primary care for women, adolescent, and pediatric populations. Emphasis includes a focus on ways in which poverty, politics, racial and ethnic disparities affect the health of families, women, children, and adolescents. Content addresses comprehensive diagnosis and management of common health problems, including appropriate diagnostic procedures, laboratory tests, and follow-up care for patients with both acute and chronic conditions. There is a strong focus on health promotion, disease prevention, the care of underserved populations, and culturally competent care.

Prerequisite: NURS 6220, NURS 6225, NURS 6230.

Learning Outcomes

1. Analyze the etiology, pathophysiology, presentation, and prognosis of women and children's conditions as they present in clinical settings.
2. Assess the public health impact of clinical problems for both women and children in the community, including the epidemiology of common risk factors and early intervention strategies.
3. Synthesize scientific and evidence-based knowledge along with theory to promote health, prevent illness and treat common acute and chronic conditions of women and children.
4. Apply the principles of health care ethics to the care of women and children with an understanding of legal implications within the sociopolitical environment.
5. Formulate a plan to investigate and manage the health state of women and children taking into account the values and preferences of the patient and addressing the personal and social issues to which the health status may give rise.

NURS 6510. FNP Across the Lifespan I**3 Credits (3)**

This is the first in a series of three didactic courses for the family nurse practitioner (FNP) student. This course introduces the FNP student to the scope and standards of practice; legal and ethical issues; differential diagnosis; as well as the identification and management of specific symptoms and conditions. Emphasis is placed on individuals across the lifespan from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6511.

Learning Outcomes

1. Apply evidence-based knowledge and theory related to the prevention, diagnosis and management of selected common acute health problems in clients across the lifespan.
2. Plan collaborative case to assist clients and their families from diverse backgrounds to maximize functional health status
3. Formulate patient centered therapeutic plans based on holistic health assessment, risk reduction and safety for the treatment and prevention of select, uncomplicated and common, acute illnesses.
4. Evaluate the current use of professional values, leadership, and ethical/legal/policy standards in the implementation of the advanced practice role.

NURS 6511. FNP Across the Lifespan Practicum I**3-4 Credits (3-4P)**

This is the first in a series of three clinical courses for the family nurse practitioner (FNP) student. Working with a preceptor students will use advance skills in patient history taking, performing physical assessments, and interpreting laboratory and other test results. Development of a plan of care with health promotion components is also expected. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 8 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6510.

Learning Outcomes

1. Integrate, implement and evaluate evidence-based therapeutic interventions in complex acute care practice situations.
2. Develop and sustain therapeutic relationships with patients across the life span (child, adolescents, young adult, adult, older adult, seniors) and other professional to optimize patient-centered outcomes.
3. Demonstrate advanced clinical judgment based on current standards of practice.
4. Use clinical judgment, systems thinking, and accountability to provide evidenced based care to patients across the lifespan.
5. Synthesize knowledge of acute and chronic illness, pharmacological interventions, legal and ethical principles and the social determinants of health in the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.

NURS 6520. FNP Across the Lifespan II**3 Credits (3)**

This is the second in a series of three didactic courses for the family nurse practitioner (FNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in the differential diagnosis and management of acute and chronic diseases. Emphasis is placed on individuals across the lifespan from diverse populations. Building on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. May be repeated up to 6 credits. NURS 6511.

Prerequisite: NURS 6510.

Corequisite: NURS 6521.

Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into immersion in practice decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Evaluate the relationships between access, cost, quality, and safety and their influence on health care.

NURS 6521. FNP Across the Lifespan II Practicum**3-4 Credits (3-4P)**

This is the second in a series of three clinical courses for the family nurse practitioner (FNP) student. This course builds on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. This course involves working with a preceptor to refine skills in assessment and differential diagnosis as well as the development and implementation of comprehensive treatment plans, that include referrals to other specialties and services. Students are expected to work within Integrated Health Care settings for a minimum of 64 hours of practicum. May be repeated up to 8 credits.

Prerequisite: NURS 6510, NURS 6511.

Corequisite: NURS 6520.

Learning Outcomes

1. Apply conceptual frameworks to and compare strategies for risk analysis and reduction, screening, disease and injury prevention, and health promotion across the life span.
2. Integrate relevant research findings in management of selected health care conditions across the life span.
3. Use the principles of case management process to coordinate effective therapeutic interventions, referrals, and collaboration with other health care providers for clients/patients with chronic illness across the life span.
4. Demonstrate cultural competence related to the individual's ethnicity, culture and lifestyle when considering prevention strategies or developing the health promotion and disease management plan for chronic conditions across the life span.
5. Analyze client and patient outcomes to identify the effectiveness of treatment, the need for change, and the health status of client/patient across the life span in an integrated care setting.
6. Apply inter-professional competencies in addressing integrated health needs of patients across the lifespan.

NURS 6530. FNP Across the Lifespan III**1 Credit (1)**

This is the final didactic course for the family nurse practitioner (FNP) student. The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common acute and chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. This course includes preparation for the FNP board certification exam. May be repeated up to 5 credits.

Prerequisite: NURS 6520, NURS 6521.

Corequisite: NURS 6531.

Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into clinical decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.
5. Use self-reflection to evaluate progress in professional development as an integral member of the interprofessional team.
6. Integrate ethical principles in decision-making and demonstrate core professional values in the implementation of the nurse practitioner role.

NURS 6531. FNP Across the Lifespan III Practicum**3-4 Credits (3-4P)**

This is the final clinical course for the family nurse practitioner (FNP) student. In this course, the student works with a preceptor to develop mastery of skills required to assess, diagnose and manage acute and chronic conditions in primary care settings. Advancement of knowledge and skills attained through previous practicum experiences, as well as this final course, produces a capable, qualified provider, who will transition into a safe, novice, primary care nurse practitioner. May be repeated up to 8 credits.

Prerequisite: NURS 6521.

Corequisite: NURS 6530.

Learning Outcomes

1. Apply theoretical concepts of patient-centered care with emphasis on health promotion, disease prevention, guidance/counseling, disease management, and palliative care during developmental transitions and life-style adjustments.
2. Incorporate primary/secondary prevention guidance into comprehensive treatment plans for patients across the lifespan.
3. Integrate history, physical examination laboratory and other test data with knowledge of pathophysiology of acute and chronic diseases/conditions to develop appropriate differential diagnoses.
4. Identify pharmacological interventions in the treatment and management of illness for diverse populations.
5. Integrate evidence-based clinical guidelines into the diagnosis and management of illness in patients across the lifespan.
6. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.

NURS 6610. Nurse Anesthesiology Principles I**3 Credits (3)**

This is the first of four sequential nurse anesthesiology principles courses and introduces the student to advanced nursing practice in anesthesia with integration of theoretical perspectives from anatomy, physiology, physics, chemistry, and related mathematics. This course focuses on the development of foundational knowledge to deliver safe, effective anesthesia care across the lifespan. Emphasis is on perioperative preparation, management, and evaluation of the patient, anesthetizing area, and equipment.

Learning Outcomes

1. Review fundamentals of safe evidence-based anesthesia practice related to anesthesia techniques, airway management techniques, perioperative patient/anesthetizing area preparation, anesthesia planning, safety measures, appropriate use of equipment and monitoring devices, and anesthesia complications
2. Demonstrate a comprehensive equipment check and proper utilization and/or interpretation of anesthesia delivery systems, airway equipment, monitoring devices, communication techniques, documentation, and patient positioning.
3. Assess patient fluid status and calculate, initiate, and manage fluid/blood component therapy.
4. Examine chemistry, physics, biochemistry, and imaging principles and their relationship to anesthesia.
5. Differentiate between acute and chronic pain management based on the neuroscience of pain.
6. Integrate anesthesia research and best practices related to basic anesthesia care, anesthesia equipment, technology, and pain management into anesthesia planning and delivery.

NURS 6620. Nurse Anesthesiology Principles II**3 Credits (3)**

This is the second of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for a variety of patients undergoing a variety of procedures such as intraabdominal, extrathoracic, neck, extracranial, orthopedic, perineal, pelvic, laser, non-operating room, and ambulatory. This course also focuses on providing students with a foundation to incorporate safe, evidence-based regional anesthesia techniques, including ultrasound-guided principles, into their clinical practice. Enhanced recovery after anesthesia and hypotensive techniques will be examined.

Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing a variety of surgical procedures.
2. Describe the indications and benefits of neuraxial and peripheral nerve blockade for diverse populations, as well as management of associated complications.
3. Identify via ultrasound key anatomy relevant to peripheral nerve blockade and demonstrate proper approach to performing common neuraxial and peripheral nerve blockade techniques.
4. Discuss anesthesia techniques, considerations, and complications (and their management) related to a variety of common procedures.
5. Explain patient selection, preparation, and monitoring needs of patients undergoing common procedures, enhanced recovery after surgery, hypotensive, and/or regional techniques.
6. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for patients undergoing common procedures and/or regional anesthesia techniques.

NURS 6630. Nurse Anesthesiology Principles III**3 Credits (3)**

This is the third of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for special populations across the lifespan including neonatal, pediatric, obstetric, geriatric, and obese patients.

Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for special populations across the lifespan undergoing a variety of surgical procedures.
2. Examine common anesthesia techniques utilized for special populations across the lifespan undergoing a variety of procedures.
3. Identify modifications required for anesthesia planning and management of special populations across the lifespan related to their physiology, comorbidities, and congenital anomalies as applicable.
4. Discuss management of anesthesia complications related to special populations across the lifespan.
5. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for special populations across the lifespan.

NURS 6640. Nurse Anesthesiology Principles IV**3 Credits (3)**

This is the final of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for more complex procedures including thoracic, vascular, neuroskeletal, diagnostic/therapeutic, trauma, burns, organ procurement/transplantation, and other pertinent procedures.

Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing a variety of complex procedures.
2. Identify common comorbid conditions of patients undergoing complex procedures.
3. Examine anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.
4. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for diverse patients undergoing a variety of complex procedures.

NURS 6710. Nurse Anesthesiology Clinical Residency I**3 Credits (3P)**

This is the first of six clinical residency courses and provides students with the opportunity to begin developing the advanced nursing practice role in anesthesiology. Students are expected to integrate didactic knowledge learned in previous courses and co-requisite courses into perianesthesia care of the patient. Students begin to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures with guidance.

NURS 6720. Nurse Anesthesiology Clinical Residency II
3 Credits (3P)

This is the second of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in Clinical Residency I and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students progressively assume more responsibility for patients as they gain skills and knowledge.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures with minimal guidance.

NURS 6730. Nurse Anesthesiology Clinical Residency III
4 Credits (4P)

This is the third of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures with minimal guidance.

NURS 6740. Nurse Anesthesiology Clinical Residency IV
4 Credits (4P)

This is the fourth of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services autonomously to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure
3. Autonomously administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures.
4. Autonomously demonstrate basic anesthesia skills/techniques and incorporate new skills.
5. Autonomously identify perianesthesia patient physiologic alterations and/or equipment alterations and initiate appropriate management utilizing evidence-based problem solving and decision making.
6. Autonomously provide anesthesia services in a rural community.
7. Use effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
8. Demonstrate integrity, ethics, honesty, and accountability in professional interactions.

**NURS 6750. Nurse Anesthesiology Clinical Residency V
4 Credits (4P)**

This is the fifth of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Independently administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures.
4. Independently demonstrate basic anesthesia skills/techniques and incorporate new skills.
5. Independently identify perianesthesia patient physiologic alterations and/or equipment alterations and initiate appropriate management utilizing evidence-based problem solving and decision making.
6. Independently provide anesthesia services in a rural community.
7. Use effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
8. Demonstrate integrity, ethics, honesty, and accountability in professional interactions.

**NURS 6760. Nurse Anesthesiology Clinical Residency VI
4 Credits (4P)**

This is the final clinical residency course and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Independently administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures.
4. Independently demonstrate basic anesthesia skills/techniques and incorporate new skills.
5. Independently identify perianesthesia patient physiologic alterations and/or equipment alterations and initiate appropriate management utilizing evidence-based problem solving and decision making.
6. Independently provide anesthesia services in a rural community.
7. Use effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
8. Demonstrate integrity, ethics, honesty, and accountability in professional interactions.

**NURS 6770. Rural Health Anesthesiology Seminar
2 Credits (2)**

This course focuses on unique issues and challenges surrounding the provision of nurse anesthesiology services in rural communities. Topics covered include working with scarce resources, needs of individuals/populations living in rural communities, regulatory issues, health policy, reimbursement practices, cultural issues, technology, and local/state/federal aspects that impact rural nurse anesthesiology practice.

Learning Outcomes

1. Define unique needs of individuals and/or populations living in rural communities.
2. Identify challenges of working with scarce resources.
3. Discuss regulatory, policy, reimbursement, and cultural issues unique to rural nurse anesthesiology practice.
4. Illustrate local, state, and/or federal issues that impact rural nurse anesthesiology practice.

NURS 6771. Anesthesiology Integration/Clinical Correlation I **2 Credits (2)**

This course is the first of a two-course sequence and is designed to further develop critical thinking skills and foster continued integration of theoretical knowledge into clinical practice. Clinically relevant evidence-based research and anesthesia topics will be presented by students and faculty. This course also includes student participation in discussion of clinical experiences and case presentations. Students will critically analyze, synthesize, and evaluate the knowledge gained in all previous nurse anesthesiology courses in preparation for the comprehensive exam, national certification examination, and clinical practice

Learning Outcomes

1. Demonstrate the ability to critically review pertinent literature and its application to clinical practice.
2. Deliver case-based presentations that incorporate current evidence-based best practices and culturally relevant information.
3. Synthesize knowledge gained from previous nurse anesthesiology coursework.
4. Analyze performance on the comprehensive exam.
5. Create an action plan to pass the National Certification Exam

NURS 6772. Anesthesiology Integration/Clinical Correlation II **2 Credits (2)**

This course is the second of a two-course sequence and continues to further develop critical thinking skills and foster continued integration of theoretical knowledge into clinical practice. Clinically relevant evidence-based research and anesthesia topics will be presented by students and faculty. This course also includes student participation in discussion of clinical experiences and case presentations. Students will continue to critically analyze, synthesize, and evaluate the knowledge gained in all previous nurse anesthesiology courses in preparation for the national certification examination and clinical practice.

Learning Outcomes

1. Demonstrate the ability to critically review pertinent literature and its application to clinical practice.
2. Deliver case-based presentations that incorporate current evidence-based best practices and culturally relevant information.
3. Demonstrate consistent professional growth and development through discussion, presentation, interaction, and individual and/or group participation.
4. Complete the student self-evaluation of graduate standards form.
5. Implement the previously created action plan to pass the NBCRNA NCE and revise it as needed.

NURS 6990. Advanced Practice Nursing Immersion **1-4 Credits (1-4)**

Practicum experience for advanced practice students. Focus will be on a practice issue chosen by the student for further development as an evidence-based doctoral project. Clinical practice hours as needed to meet DNP requirements. Up to 24 credits may be completed by student. Restricted to: NURP majors. May be repeated up to 24 credits.

Prerequisite: NURS 6220, NURS 6530 or enrollment in post-masters track.

NURS 6993. Doctoral Nursing APRN Seminar **1 Credit (1P)**

Seminar to build APRN clinical skills, consisting of a 32-40 hour on-site immersion with skills labs and Objective Structured Clinical Evaluation using standardized patients that are used as formative and summative evaluation. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6224.

Learning Outcomes

1. Apply clinical decision making skills to diagnose and treat given patient cases in area of specialty.
2. Integrate screening and diagnostic tools into diagnosis and treatment of given patient cases in area of specialty.
3. Use advanced health assessment skills to differentiate between normal, variations of normal and abnormal findings.
4. Develop skills in the interpretation of commonly used diagnostic tests in management of patient conditions in area of specialty.
5. Perform procedures commonly used in the treatment of patients in area of specialty.

NURS 6997. Independent Study **1-6 Credits (1-6)**

Individual studies and directed research with prior approval of department head. May be repeated up to 12 credits.

NURS 7000. Doctoral Dissertation **1-9 Credits (1-9)**

Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits. May be repeated up to 30 credits.

Learning Outcomes

1. Varies

NURS 999. Practical Nursing Requirements Completed **99 Credits**

A phantom course created to indicate a student has met Practical Nursing requirements. Used to indicate this in academic history to replace an administrative message not converted from SOLAR to VISTAS. 01/97 May be repeated up to 99 credits.

Learning Outcomes

1. N/A

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Nursing - Bachelor of Science in Nursing

Four-Year Curriculum Plan Courses

A grade of C- or better is required for all courses in the curriculum. Students must also complete six elective credits from the Part III Viewing a Wider World general education category.

Math basic academic skills requirement must be satisfied.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
English Composition - Level 1 ¹		
English Composition - Level 2 ¹		
Oral Communication ¹		
<i>Area II: Mathematics</i>		
Choose one from the following: ²		3-4
MATH 1220G	College Algebra	
MATH 1430G	Applications of Calculus I	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1511G	Calculus and Analytic Geometry I	
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H Calculus and Analytic Geometry II Honors		
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CEPY 1120G	Human Growth and Behavior	3
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
PSYC 1110G	Introduction to Psychology	3
Viewing A Wider World ³		6
Departmental/College Requirements		
<i>Nursing Courses</i> ⁴		
<i>Level 1</i>		
NMNC 3110	Introduction to Nursing Concepts	3
NMNC 3135	Principles of Nursing Practice	4
NMNC 3120	Evidence-Based Practice	3
Choose one from the following (3-6 credits):		3-6
NURS 3110	Human Pathophysiology Foundation for Nursing	
BIOL 2511 & BIOL 2512	Human Pathophysiology and Human Pathophysiology II	
<i>Level 2</i>		
NMNC 3210	Health and Illness Concepts I	3
NMNC 3220	Health Care Participant	3
NMNC 3230	Nursing Pharmacology	3
NMNC 3235	Assessment and Health Promotion	4
<i>Level 3</i>		
NMNC 4310	Health & Illness Concepts II	3
NMNC 4320	Professional Nursing Concepts I	3
NMNC 4335	Care of Patients with Chronic Cndtns	4
Nursing Elective Course-3 credits (Specific List of Courses from Nursing Advisor)		3

Level 4

NMNC 4410	Health & Illness Concepts III	4
NMNC 4435	Clinical Intensive I	4
NMNC 4445	Clinical Intensive II	4

Level 5

NMNC 4510	Concept Synthesis	3
NMNC 4520	Professional Nursing Concepts II	3
NMNC 4535	Clinical Intensive III	4
NMNC 4545	BSN Capstone	4

Non-Departmental Requirements (in addition to Gen.Ed/VWW)

NUTR 2110	Human Nutrition	3
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Anatomy and Physiology Requirement

Choose one combination of courses from the following: 8

Combination One

BIOL 2210 & BIOL 2225	Human Anatomy and Physiology I for the Health Sciences and Human Anatomy and Physiology II
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Combination Two

BIOL 2221 or BIOL 354	Human Physiology Physiology of Humans
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and

BIOL 353 & 353 L	Pre-Professional Human Anatomy and Pre-Professional Human Anatomy Laboratory
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Combination Three

SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory
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and

SPMD 3210 & 3210L	Anatomy and Physiology II and Anatomy and Physiology II Lab
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Statistics Requirement

Choose one from the following: 3

MATH 1350G	Introduction to Statistics
MATH 2350G	Statistical Methods
A ST 311	Statistical Applications

Microbiology Requirement

Choose one from the following: 4-5

BIOL 2310 & 2310L	Microbiology and Microbiology Lab
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory

Second Language: (not required)

Electives, to bring the total credits to 122 0

Total Credits 122-127

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ **Formal Acceptance required before taking NURSING courses.** The NMSU School of Nursing participates in the New Mexico Nursing Education Consortium. The nursing curriculum offered is the NMNEC Statewide Curriculum Plan.

Note: A grade of C- or better is required for all courses in the curriculum. You must also complete 6 elective credits from the Part III Viewing a Wider World general education category.

1. An applicant who is not a U.S. citizen or who has been convicted of a felony is advised to contact the appropriate State Board of Nursing regarding eligibility for licensure.
2. Clinical clearances are required for all students prior to admission and concurrent with each semester of studies. These include: current immunizations; background screening; drug testing; individual health insurance coverage; current CPR status; various health agency orientations, as well as other requirements mandated by clinical affiliation agreements. Failure to complete and provide documentation within timelines established by the School of Nursing may prevent admission to/or continuation within the nursing program.
3. Students are required to make a satisfactory score on nationally-normed, standardized tests before application. In the last semester of the curriculum, students are required to take a comprehensive/standardized exam and to make a satisfactory score on this exam prior to their final clinical experience.
4. Newly admitted students are required to attend an orientation session which occurs prior to the start of classes for their first nursing semester.
5. School-wide activities begin 1-3 days prior to the start of classes. Attendance is required.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
MATH 1220G	College Algebra ¹	3
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors) ¹	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory ¹	4
PSYC 1110G	Introduction to Psychology	3
Credits		18
Semester 2		
MATH 1350G	Introduction to Statistics ¹	3
CEPY 1120G	Human Growth and Behavior	3
Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication ¹	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
Choose from one of the following:		4-5
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory ¹	
BIOL 2210	Human Anatomy and Physiology I for the Health Sciences ¹	

BIOL 353 & 353 L	Pre-Professional Human Anatomy and Pre-Professional Human Anatomy Laboratory ¹	
NUTR 2110	Human Nutrition	3
Credits		16-17
Second Year		
Semester 1		
BSN Application Term - start planning for HESI exam (resources and deadlines)		
COMM 1115G	Introduction to Communication	3
Choose from one of the following:		3-4
SPMD 3210 & 3210L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
BIOL 2225	Human Anatomy and Physiology II (Fall Only)	
BIOL 354	Physiology of Humans (Spring Only)	
Choose from one of the following:		4-5
BIOL 2310 & 2310L	Microbiology and Microbiology Lab	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory ¹	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory ¹	
Area V: Humanities Course ²		3
Credits		13-15
Semester 2		
NMNC 3110	Introduction to Nursing Concepts	3
NMNC 3135	Principles of Nursing Practice	4
NURS 3110	Human Pathophysiology Foundation for Nursing	4
NMNC 3120	Evidence-Based Practice	3
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
Credits		14
Third Year		
Semester 1		
NMNC 3210	Health and Illness Concepts I	3
NMNC 3220	Health Care Participant	3
NMNC 3230	Nursing Pharmacology	3
NMNC 3235	Assessment and Health Promotion	4
Area VI: Creative and Fine Arts Course ²		3
Credits		16
Semester 2		
NMNC 4310	Health & Illness Concepts II	3
NMNC 4320	Professional Nursing Concepts I	3
NMNC 4335	Care of Patients with Chronic Cndtns	4
VWW: Viewing a Wider World Course ³		3
NURS Elective Course		3
Credits		16
Fourth Year		
Semester 1		
NMNC 4410	Health & Illness Concepts III	4
NMNC 4435	Clinical Intensive I	4
NMNC 4445	Clinical Intensive II	4
VWW: Viewing a Wider World Course ³		3
Credits		15
Semester 2		
NMNC 4510	Concept Synthesis	3
NMNC 4520	Professional Nursing Concepts II	3

NMNC 4535	Clinical Intensive III	4
NMNC 4545	BSN Capstone	4
Credits		14
Total Credits		122-125

- ¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
- ² See the General Education (p. 220) section of the catalog for a full list of courses
- ³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Public Health Sciences

Undergraduate Program Information

The curriculum in public health prepares students for careers in community and public health programs, also in voluntary, private and governmental agencies. Upon completion of the degree, the graduate is eligible to take the national Certified Health Education Specialist (CHES) examination administered by the National Commission for Health Education Credentialing, Inc. The Bachelor of Public Health program is fully accredited by the Council on Education for Public Health (CEPH).

Students seeking admission to the Bachelor of Public Health degree in the Department of Public Health Sciences at NMSU are first admitted as pre-public health (PPHL) students. Students keep this designation until they have met the following admissions requirements:

1. A cumulative grade-point average of at least 2.5 after completing specified general education coursework (the common core).
2. A grade of C- or better in prerequisite departmental courses

Prefix	Title	Credits
PHLS 1110G	Personal Health & Wellness	3
PHLS 2110	Foundations of Health Education	3
PHLS 2120	Essentials of Public Health	3
3. A grade of C- or better in MATH 1215 Intermediate Algebra.
4. A grade of C- or better in MATH 1350G Introduction to Statistics or A ST 311 Statistical Applications..
5. Submission of an application packet that includes
 - a. a brief personal statement of interest in the profession, and
 - b. a completed application for the Bachelor of Public Health degree program.

The Bachelor of Public Health (BPH) degree program accepts applicants during the Spring and Fall semesters. The deadlines for accepting application packets are September 15th for Spring admission and February 15th for Fall admission. All applications must be submitted to the Program Advisor at the Center for Academic Advising and Student Support at Garcia Center. Courses are offered both face-to-face and online.

Applicants may receive a conditional acceptance into the program if they are currently enrolled in the last of the required prerequisites at the time they submit an application to the Bachelor of Public Health degree program. Such conditional acceptance will be revoked if the applicant does not successfully complete each of the prerequisite courses.

Students must attain a grade of C- or better in all required PHLS core coursework.

Failure to obtain a satisfactory grade of C or better in any two PHLS courses could be grounds for dismissal from the program. Any student who receives two or more grades of D or F in required PHLS core courses must petition, in writing, to continue as a major.

Graduate Program Information

The Department of Public Health Sciences offers the Master of Public Health degree (MPH) in Health Behavior and Health Promotion concentration and Health Management, Administration, and Policy concentration. The degree program prepares public health professionals to function in a variety of settings, including health programs at the local, state, and federal government levels; profit and nonprofit organizations and agencies; worksite settings; and educational institutions. The MPH program is fully accredited by the Council on Education for Public Health (CEPH).

Students may participate in either the full-time on-campus MPH program with HBHP concentration or either of the part-time (i.e., two courses/semester) online programs, including HBHP concentration or the HMAP concentration. All coursework for online degrees can be completed off-campus utilizing web-based technologies aimed at meeting the needs of working students and others for whom a campus-based program is not an option.

Admissions Requirements

In addition to meeting all admissions requirements of the Graduate School, applicants must meet the following departmental requirements:

- Complete a short personal statement describing the applicant's reasons for wishing to pursue the MPH degree at NMSU. Any paid or volunteer work performed in a public health or related agency setting should also be described in detail, including the length of work and descriptions of the work typically performed as part of the job.
- Submit at least three letters of reference from former faculty and/or employers.

Applications are now completed online. Go to <http://gradschool.nmsu.edu/>. For more information, contact the Graduate Coordinator at mphapps@nmsu.edu, or visit the website: publichealth.nmsu.edu (<https://publichealth.nmsu.edu>).

Degrees for the Department

Bachelor Degree(s)

- Public Health - Bachelor of Public Health (p. 1201)
- Public Health - Bachelor of Public Health (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-bph-online/>)

Master Degree(s)

- Master of Public Health/Master of Social Work - Dual Degree (<http://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/>)
- Public Health (Health Behavior & Health Promotion) - Master of Public Health (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-health-behavior-health-promotion-mph-online/>)
- Public Health (Health Behavior and Health Promotion) - Master of Public Health (p. 159)

- Public Health (Health Management, Administration & Policy) - Master of Public Health (p. 161)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-health-mgt-admin-policy-mph-online/>)

Doctoral Degree(s)

- Health Equity Sciences - Doctor of Philosophy (p. 193)

Minors for the Department

- Gerontology - Graduate Minor (p. 215)
- Gerontology - Undergraduate Minor (p. 1203)
- Public Health - Undergraduate Minor (p. 1203)
- U.S.-Mexico Border Health Issues - Graduate Minor (p. 220)
- U.S.-Mexico Border Health Issues - Undergraduate Minor (p. 1203)

Graduate Certificate(s)

- Public Health - Graduate Certificate (p. 208)
- Public Health - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/public-health-gr-certificate-online/>)

Teresa Keller, PhD, RN- Acting Department Head

Professors Khubchandani, Kopera-Frye, McDonald (Emerita), Palacios, Tomaka; **Associate Professor** Wilson; **Assistant Professors** Magoc, Rahman, Shaver, Shin, Stimatze; **College Professor** Latz

E. England-Kennedy PhD (University of Arizona, Tucson) - homelessness and health, suicide prevention, social and environmental justice, health equity; K. Kopera-Frye, PhD (Wayne State University) - gerontology, health promotion and obesity among ethnically diverse groups, rural health, substance abuse; D. Magoc, PhD (U. of Texas at El Paso) – active living, health behavior; R. Palacios, PhD (U. of Texas at El Paso) – cancer survivorship, masculinity and health, cultural adaptations; H. Rahman, MD (Rangpur Medical College, Bangladesh), PhD (University of South Florida) - toxicology; C. Shaver, DHA, IHC (Central Michigan University); Rural public health, opioid use disorder, global health systems; D.Y. Shin, PhD (University of Alabama, Birmingham) - healthcare management; T. Stimatze, Ph.D. (New Mexico State U.) biostatistics, J. Tomaka, PhD (U. of Buffalo), Graduate Coordinator– health behavior, program evaluation; S.L. Wilson, PhD (Southern Methodist U.) – health policy, rural health, international health, health disparities

Emeritus J.E. Brandon, PhD, MCHES (Southern Illinois U.), Emeritus – border health issues; J. Robinson III, Ed.D., FAAHE (U. of Northern Colorado), Emeritus – health education. J. McDonald, PhD, (U Washington) Emeritus-epidemiology

Public Health Sciences Courses

PHLS 1110G. Personal Health & Wellness

3 Credits (3)

A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others. May be repeated up to 3 credits.

Learning Outcomes

1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 1110H. Personal Health and Wellness Honors**3 Credits (3)**

A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others. In addition students will complete an experiential learning component or project. May be repeated up to 3 credits.

Learning Outcomes

1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 2110. Foundations of Health Education**3 Credits (3)**

Role and responsibility of the health educator with emphasis on small group dynamics, oral and written communication skills, building community coalitions and introduction to grant writing. Taught with PHLS 375. Cannot receive credit for both PHLS 2110 and PHLS 375. May be repeated up to 3 credits.

Prerequisite: PHLS 1110G, or consent of instructor.

Learning Outcomes

1. Define health, three levels of prevention, health education and health promotion, and describe the major determinants of health.
2. Describe the 7 major areas of responsibility, major competencies and sub-competencies of a professional health educator and the CHES's possible roles in various community health settings.
3. Describe and examine the historical context and development of the profession of health education.
4. Identify and critique major processes and practices of health education programming.
5. Describe the steps involved in conducting needs assessments, program and intervention planning, implementation, and program evaluation.
6. Identify, examine and describe elected health behavior change theories and models and explore possible applications in health education practice.
7. Describe and discuss the process of community mobilization and building of a community coalition.
8. Identify health issues and describe effective methods/strategies in health education advocacy.
9. Describe and discuss the future trends and issues in the professional preparation and practice of professional health educators. 1
10. Demonstrate effective and appropriate oral and written communication skills for health education professionals.

PHLS 2120. Essentials of Public Health**3 Credits (3)**

The course will focus on principles and major areas of public health, including ecological and total personal concept of health care system, epidemiological approaches to disease prevention and control. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the sources of public health data, and how to interpret that information.
2. Access existing health related data.
3. Analyze health related data.
4. Identify populations for health education programs.
5. Incorporate data analysis and principles of community organization.
6. Interpret results from evaluation and research.
7. Infer implications from findings for future health-related activities.
8. Have a basic understanding of health topics faced by various populations.

PHLS 3110V. Human Sexuality**3 Credits (3)**

Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles. May be repeated up to 3 credits.

PHLS 3120V. Women's Health Issues**3 Credits (3)**

A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: GNDR 381V. May be repeated up to 3 credits.

PHLS 3130V. Global Environmental Health Issues**3 Credits (3)**

Introduction to global environmental health challenges in the 21st century with an emphasis on environmental problems as they affect public health and personal well-being. May be repeated up to 3 credits.

PHLS 3210. Foundations of Community Health Education**3 Credits (3)**

Role and responsibility of the health educator, with emphasis on small-group dynamics, oral and written communication skills, building community coalitions, and an introduction to grant writing. Equivalent to PHLS 2110 for prerequisite purposed. May be repeated up to 3 credits.

PHLS 3220. Foundations of Public Health**3 Credits (3)**

The course will focus on principles and major areas of public health, including ecological concepts of healthcare systems and epidemiological approaches to disease promotion and control. Equivalent to PHLS 2120 for prerequisites. May be repeated up to 3 credits.

PHLS 4130. Environmental Health**3 Credits (3)**

Introduction to environmental health designed to address public health issues. May be repeated up to 3 credits. Restricted to: PH,PHL majors.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4210. Methods of Community Health Education**3 Credits (3)**

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4310. Biometrics and Health Research**3 Credits (3)**

Critical analysis of community health research and related methodologies. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: (MATH 1350G) or MATH 2350G or A ST 311.

PHLS 4320. Epidemiology**3 Credits (3)**

Epidemiologic approaches to disease prevention and control. Factors influencing health status. Restricted to: PHL majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4410. Administration of Health Programs**3 Credits (3)**

Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. Restricted to: PHL majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220, PHLS 2120, or consent of instructor.

PHLS 4420. Health Program Planning**3 Credits (3)**

Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3210 or PHLS 2120 and PHLS 4430.

PHLS 4430. Theoretically-Based Interventions**3 Credits (3)**

Identifying and developing interventions to problematic health-related behaviors. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4440. Health Program Evaluation and Research**3 Credits (3)**

Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice. May be repeated up to 3 credits.

Prerequisite: PHLS 4420.

PHLS 4510. Public Health Seminar in Community Health Education**1 Credit (1)**

Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. Restricted to: Public Health majors. May be repeated up to 1 credit.

Prerequisite: PHLS 4320, PHLS 4420, and PHLS 4430 or consent of instructor.

PHLS 4515. Problems in Health Education**3 Credits (3)**

Provides opportunity for synthesis of program planning, implementation, and evaluation methodologies in the preparation and delivery of health education topics. Some field trips will be required. Restricted to: PHL majors. May be repeated up to 3 credits.

Prerequisite: Either PHLS 3220, PHLS 2120, PHLS 4440, PHLS 4430, or consent of instructor.

PHLS 4610. Health Disparities: Determinants and Interventions**3 Credits (3)**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. May be repeated up to 3 credits.

PHLS 4620V. Cross-Cultural Aspects of Health**3 Credits (3)**

An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 4630. International Health Problems**3 Credits (3)**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with PHLS 5630. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120 or consent of instructor.

PHLS 4640. Rural Health Issues**3 Credits (3)**

Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. Taught with PHLS 5640. May be repeated up to 3 credits.

PHLS 4650. Coping with Loss and Grief: A Cross-Cultural Perspective**3 Credits (3)**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with PHLS 5650. May be repeated up to 3 credits.

PHLS 4660. U.S.-Mexico Border Health Issues**3 Credits (3)**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with PHLS 5660 May be repeated up to 3 credits.

PHLS 4670. American Indian Health**3 Credits (3)**

Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits.

PHLS 4710. Introduction to Gerontology**3 Credits (3)**

Social, psychological, and physiological aspects of aging, with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. Taught with PHLS 5710. May be repeated up to 3 credits.

PHLS 4720. Health Promotion for the Older Adult**3 Credits (3)**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Taught with PHLS 5720. May be repeated up to 3 credits.

PHLS 4730. Adulthood and Aging**3 Credits (3)**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. Taught with PHLS 5730. May be repeated up to 3 credits.

PHLS 4740. Aging and Public Policy**3 Credits (3)**

Exploration of public policies relating to elders, historical development, current status and trends in public policy for this age group. Impact of political behavior of elders on policy making and implementing processes. May be repeated up to 3 credits.

PHLS 4810. Infectious and Noninfectious Disease Prevention**3 Credits (3)**

History, etiology, and prevention of diseases affecting humans. Restricted to: Public Health majors. Taught with PHLS 5810. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120, PHLS 4320 and Consent of Instructor.

PHLS 4820. Health Informatics**3 Credits (3)**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. Taught with PHLS 5820. Restricted to: Restricted to Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120 or consent of instructor.

PHLS 4996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 4997. Independent Study**1-6 Credits (1-6)**

Individual studies with prior approval of department head. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 4998. Community Health Education Field Experience**1-6 Credits (1-6)**

Senior-standing community health education majors will integrate and apply various concepts related to actual community health education practice. Experience aims to prepare students to integrate the competencies and responsibilities of community health education. Approximately 55 hours at field agency required per credit hour.

Restricted to: Public Health majors. May be repeated up to 6 credits.

Prerequisite: PHLS 4210 or concurrent enrollment.

Learning Outcomes

1. Varies

PHLS 5110. Community and Psychosocial Aspects of Public Health**3 Credits (3)**

Social, behavioral, and educational aspects of disease prevention and health promotion programs. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5120. Biostatistical Applications in Public Health**3 Credits (3)**

Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5130. Epidemiological Approaches to Disease Control and Prevention**3 Credits (3)**

Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5140. Health Services System: Administration and Organization
3 Credits (3)

This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health services organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the main components of the organization for health care delivery and health care system in the U.S.
2. Compare health care systems in the U.S. and other developed countries.
3. Discuss resources and the principles of resources management in health care delivery.
4. Apply essential management functions (planning, organizing, staffing, leading, and controlling) to health services organizations.
5. Apply leadership and motivation concepts to the management of health services organizations.
6. Apply the principles and models of decision-making, communication, and managing change to address organizational challenges.
7. Demonstrate the knowledge and skills inherent in interprofessional work
8. Discuss how systems thinking works for healthcare delivery systems.

PHLS 5150. Environmental Public Health Issues**3 Credits (3)**

Environmental health issues from a public health perspective. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5160. Public Health Policy Analysis**3 Credits (3)**

This graduate-level course presents the key aspects of the policymaking process in the United States. The course introduces students to the steps necessary to formulate, implement, and modify healthcare policies. Economic, cultural, institutional, and social factors influencing policymaking will be explored. The evolution of federal health policy, including major healthcare reform efforts, will be presented. Students will be provided with the necessary tools to comprehend and explain policymaking. The class will primarily focus on federal-level health policymaking, but several examples of state-level policies will be discussed. May be repeated up to 3 credits.

Learning Outcomes

1. Define and describe key health policy concepts: health, health determinants, public policy, and health policy.
2. Appreciate the significance of the Patient Protection and Affordable Care Act (ACA) and other major healthcare reform efforts and laws.
3. Describe the Longest Conceptual Model of the Public Policymaking Process and its key components of policy formulation, implementation, and modification.
4. Articulate the roles played by legislators, interest groups, researchers, and citizens in shaping and influencing health policy.
5. Summarize the roles of the three levels of government in making health policy.
6. Identify major health policy issues currently facing U.S. healthcare.

PHLS 5210. Foundations & Techniques of Public Health Education**3 Credits (3)**

Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education. May be repeated up to 3 credits.

Learning Outcomes

1. Explain, demonstrate, and apply health communication, education, and promotion knowledge and skill competencies
2. Discuss the means by which structural biases, social inequities, and other social determinants of health undermine health and create challenges to achieving health equity at interpersonal, organizational, community, societal, cultural, and legal and policy levels
3. Explain and demonstrate ways in which health communication, education, and promotion techniques can be utilized to increase health equity and reduce health disparities
4. Utilize health behavior change theories to develop health communication, education and promotion materials, processes, and goals
5. Identify best practices and evidence-based strategies and programs for use in health communication, education, and promotion

PHLS 5220. Techniques of Health Communication/Education**3 Credits (3)**

Application of a wide range of communication and education theories/methods, including program planning and evaluation, in public health programming. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5230. Community Organization in Public Health**3 Credits (3)**

Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5240. Health Program Planning**3 Credits (3)**

Covers process of successful public health education program planning and grant writing. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5250. Evaluative Approaches in Public Health**3 Credits (3)**

Survey and analyses of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5120.

PHLS 5260. Research and Resources in Community Health**3 Credits (3)**

Exploration of available public health research studies, data, results and implications. Restricted to MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5120.

PHLS 5310. Principles of Health Program Management**3 Credits (3)**

This course prepares the student to assume a supervisory role in the management of health and human services programs. The course will cover essential management functions such as leadership, organizational assessment, planning, decision-making, organizational structure, budgeting, marketing, and human resource management. May be repeated up to 3 credits.

PHLS 5320. Health Services Organization and Delivery**3 Credits (3)**

This course includes the framework of the United States healthcare system; organization and administration of health services; alternate ways of organizing and financing health systems; the roles of the government and free market on health care services; and the barriers to health services delivery. May be repeated up to 3 credits.

PHLS 5330. Public Health Finance and Budget Management**3 Credits (3)**

Introduces health care accounting and finance to non-financial students. Students are exposed to the financial structure of health care organizations and the environment within which they operate. Instruction also introduces the use of accounting and financial information in investor-owned and not-for-profit organizations in the health care industry. Topics include understanding the creation and interpretation of financial statements, financial accounting and reporting requirements, financial analysis, budgeting, and resource allocation. May be repeated up to 3 credits.

PHLS 5340. Public Health Law and Ethics**3 Credits (3)**

This course examines major legal and ethical concepts and their impact on public health policy and practice. The course examines governmental authority, at various jurisdictional levels, to improve public health. This course will focus on public health law in the United States. Restricted to: MPH majors. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

PHLS 5610. Health Disparities: Determinants and Interventions**3 Credits (3)**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. Taught with: PHLS 4610. May be repeated up to 3 credits.

PHLS 5620. Cross-Cultural Aspects of Health**3 Credits (3)**

An examination of health practices from a variety of cultural perspectives; communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 5630. International Health Problems**3 Credits (3)**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with: PHLS 4630. May be repeated up to 3 credits.

PHLS 5635. International Health Practicum**1-3 Credits (1-3)**

Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits.

PHLS 5640. Rural Health Issues**3 Credits (3)**

Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Taught with: PHLS 4640. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

PHLS 5650. Coping with Loss and Grief: A Cross-Cultural Perspective**3 Credits (3)**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with: PHLS 4650.

PHLS 5660. U.S.-Mexico Border Health Issues**3 Credits (3)**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with: PHLS 4660. May be repeated up to 3 credits.

PHLS 5670. American Indian Health**3 Credits (3)**

Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits.

PHLS 5710. Introduction to Gerontology**3 Credits (3)**

Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. May be repeated up to 3 credits.

PHLS 5720. Health Promotion for the Older Adult**3 Credits (3)**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. May be repeated up to 3 credits.

PHLS 5730. Adulthood and Aging**3 Credits (3)**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. May be repeated up to 3 credits.

PHLS 5810. Infectious and Noninfectious Disease Prevention**3 Credits (3)**

History, etiology, and prevention of diseases affecting humans. Consent of Instructor required. May be repeated up to 3 credits.

PHLS 5820. Health Informatics**3 Credits (3)**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. May be repeated up to 3 credits.

PHLS 5830. Public Health Preparedness and Response**3 Credits (3)**

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits.

PHLS 5996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. Restricted to: MPH majors. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 5997. Independent Study**1-6 Credits (1-6)**

Individual studies with prior approval of department head. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHLS 5998. Field Experience**1-4 Credits (1-4)**

Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. Consent of department head required. Restricted to MPH majors. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

PHLS 5999. Master's Thesis**1-6 Credits (1-6)**

Minimum of 4 credits required but may be repeated for a maximum of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

Name: Department of Public Health Sciences Office

Office Location: HSS room 326

Phone: (575) 646-4300

Website: <http://publichealth.nmsu.edu/> (<http://publichealth.nmsu.edu/>)

Public Health - Bachelor of Public Health

Departmental Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. You are required to complete the following Public Health Sciences core courses.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		10
	<i>English Composition - Level 1</i> ¹	
	<i>English Composition - Level 2</i> ¹	
	<i>Oral Communication</i> ¹	
<i>Area II: Mathematics</i>		
MATH 1350G	Introduction to Statistics ²	3
or MATH 2350G	Statistical Methods	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10-11
PHLS 1110G	Personal Health & Wellness	
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences (4 or 3 credits) ¹		
<i>Area V: Humanities</i> ¹		3

Area VI: Creative and Fine Arts ¹	3
General Education Elective ¹	3-4
Viewing a Wider World Courses ³	6
Departmental/College Requirements	
<i>Prerequisite Courses</i>	
PHLS 2110 Foundations of Health Education or PHLS 3210 Foundations of Community Health Education	
PHLS 3220 Foundations of Public Health or PHLS 2120 Essentials of Public Health	
MATH 1215 Intermediate Algebra	
<i>Public Health Education Core</i>	
PHLS 4820 Health Informatics	3
PHLS 4420 Health Program Planning	3
PHLS 4210 Methods of Community Health Education	3
PHLS 4810 Infectious and Noninfectious Disease Prevention	3
PHLS 4440 Health Program Evaluation and Research	3
PHLS 4998 Community Health Education Field Experience	6
PHLS 4510 Public Health Seminar in Community Health Education	1
PHLS 4515 Problems in Health Education	3
<i>Public Health Core</i>	
PHLS 4320 Epidemiology	3
PHLS 4310 Biometrics and Health Research	3
PHLS 4130 Environmental Health	3
PHLS 4410 Administration of Health Programs	3
PHLS 4430 Theoretically-Based Interventions	3
<i>Cultural Foundations Course Requirements</i>	
Select 3 credits from the following:	3
PHLS 4610 Health Disparities: Determinants and Interventions	
PHLS 4620V Cross-Cultural Aspects of Health	
PHLS 4630 International Health Problems	
PHLS 4640 Rural Health Issues	
PHLS 4650 Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 4660 U.S.-Mexico Border Health Issues	
<i>Departmental Electives</i>	
Elective PHLS courses ⁴	24
Second Language: (not required)	
Electives, to bring the total credits to 120 ⁵	15
Total Credits	120-122

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods is required for the degree but students may first need to take any prerequisites needed to enter MATH 1350G or MATH 2350G.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁴ Students are encouraged to select additional PHLS courses to satisfy the elective requirement. Students with an associate degree in an allied health field may transfer up to 24 credit hours of electives.

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

Additional Requirements

All students are required to complete an exit survey please see the department for more information.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1215 Intermediate Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I	4
MATH 1215	Intermediate Algebra	3
Area III: Laboratory Science Course ²		4
Area VI: Creative and Fine Arts Course ²		3
Elective Course		1
Credits		15

Semester 2

Choose from one of the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Choose from one of the following (B grade or better):		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
PHLS 1110G	Personal Health & Wellness	3
Area V: Humanities Course ²		3
Elective Course		3
Credits		15

Second Year

Semester 1

PHLS 3210	Foundations of Community Health Education	3
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course ²		3-4
General Education Elective Course ²		3-4
Elective Course		3
Elective Course		3
Credits		15-17

Semester 2

PHLS 3220	Foundations of Public Health	3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Elective Course		3
VWW: Viewing a Wider World Course ³		3
Elective Course		3
Credits		15

Third Year

Semester 1

PHLS 4320	Epidemiology	3
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PHLS 4430	Theoretically-Based Interventions	3
PHLS 4820	Health Informatics	3
PHLS Cultural Foundations Course (4610 - 4660 course number)		3
Elective Course		3

Credits 15

Semester 2

PHLS 4310	Biometrics and Health Research ¹	3
PHLS 4420	Health Program Planning	3
PHLS 4210	Methods of Community Health Education ¹	3
VWW: Viewing a Wider World Course ³		3
Elective Course		3

Credits 15

Fourth Year

Semester 1

PHLS 4130	Environmental Health ¹	3
PHLS 4410	Administration of Health Programs ¹	3
PHLS 4440	Health Program Evaluation and Research ¹	3
PHLS 4510	Public Health Seminar in Community Health Education ¹	1

Elective Course 3

Elective Course 3

Credits 16

Semester 2

PHLS 4515	Problems in Health Education	3
PHLS 4810	Infectious and Noninfectious Disease Prevention	3
PHLS 4998	Community Health Education Field Experience	6
Elective Course (as needed to fulfill 120 credit hour degree requirement)		2

Credits 14

Total Credits 120-122

¹ These courses may have prerequisites and/or co-requisites, and it is the student's responsibility to check and fulfill those prerequisites and corequisites.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Gerontology - Undergraduate Minor

All courses for this minor are offered online

The Undergraduate Minor in Gerontology requires a grade of C- or higher in all courses taken to complete the requirements of the minor.

Prefix	Title	Credits
Required Courses		
PHLS 4710	Introduction to Gerontology	3
PHLS 4720	Health Promotion for the Older Adult	3
PHLS 4740	Aging and Public Policy	3
PHLS 4730	Adulthood and Aging	3
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	3
PHLS 4996	Special Topics (Aging in a Multicultural Society)	3
Total Credits		18

Public Health - Undergraduate Minor

The Undergraduate Minor in Public Health requires a grade of C- or higher in all courses used to meet the requirements of the minor.

Prefix	Title	Credits
Public Health Core Courses (12 credits)		
PHLS 2110	Foundations of Health Education	3
or PHLS 3210	Foundations of Community Health Education	
PHLS 3220	Foundations of Public Health	3
PHLS 4320	Epidemiology	3
PHLS 4410	Administration of Health Programs	3
<i>Select one course from the following (3 credits)</i>		3
PHLS 3110V	Human Sexuality	
PHLS 3120V	Women's Health Issues	
<i>Select one course from the following (3 credits)</i>		3
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4630	International Health Problems	
PHLS 4640	Rural Health Issues	
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	
Total Credits		18

¹ All public health minors must complete MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods with a B- or better before taking PHLS 4320 Epidemiology.

U.S.-Mexico Border Health Issues - Undergraduate Minor

A grade of C- or better is required for all minor requirements.

Prefix	Title	Credits
Core Requirements		
The course below (3 credits) is required for the minor:		3
PHLS 4660	U.S.-Mexico Border Health Issues	
Select five courses (15 credits) from the following:		15
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4630	International Health Problems	
PHLS 4640	Rural Health Issues	
PHLS 4996	Special Topics (when subtitle relates to US-Mexico Border Health)	
Total Credits		18

School of Teacher Preparation, Administration and Leadership (TPAL)

School of Teacher Preparation, Administration, and Leadership

The NMSU College of Health, Education, and Social Transformation's School of Teacher Preparation, Administration, and Leadership (TPAL)

is devoted to the preparation of master educators, administrators and leaders for public, private, and governmental institutions. Graduates are prepared to serve as teachers, directors of instruction and curriculum, subject matter specialists, supervisors of student teaching, educational leaders, and university professors. The School of TPAL offers multiple undergraduate and graduate degree programs and pathways within several academic units including Curriculum and Instruction, Educational Leadership and Administration, Special Education, and the Teacher Education Program.

Vision

We serve the State of New Mexico, borderlands and global communities with socially responsive scholarship, innovative programs, and collaborative initiatives in education that foster and enhance the capacity of educators and communities to advance equity, democracy, and social justice in education and society.

Mission

As a School within a land-grant and Hispanic Serving Institution, we support and advocate for equitable education for all, especially historically marginalized and multicultural/multilingual communities and students with exceptionalities. We accomplish this through teaching, scholarship, public service, the preparation of teachers and leaders, and collaborations across the disciplines and with our constituents.

TPAL Undergraduate Programs

Freshmen Admission Requirements

First Steps – Admission to NMSU

In order to earn a license to teach, one must complete a bachelor's degree, so the first step is to apply to the university and declare a major (Undergraduate Admissions (<http://admissions.nmsu.edu/>)). Our undergraduate students are advised by the Center for Academic Advising and Student Support (<https://advising.nmsu.edu/>), and students have several choices of majors. To apply for undergraduate admission and to see complete admissions information, please see NMSU's Undergraduate Admissions (<https://admissions.nmsu.edu/how-to-apply/first-time-freshmen/>) page. First time freshmen are eligible for regular admission to NMSU if they are a graduate of an accredited high school and meet one of the following Freshman Admission Requirements listed below:

- A cumulative high school GPA of 2.75, or
- ACT composite score of 21 or SAT score of 1060, or
- Ranked in the top 20 percent of their graduating class

Bachelor Programs with Teacher Licensure

The primary function of the undergraduate programs in the School of TPAL is the preparation of licensed teachers for early childhood, elementary and secondary schools. This process includes a broad general education, professional education and teaching specializations.

Undergraduate Teaching Majors in the School of TPAL include the Bachelor of Science in Education with majors in:

- Early Childhood Education – Age 3 to 3rd grade (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ee.html>)
- Elementary Education – K to 8th grade (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-eed.html>)
- Secondary Education: 7th to 12th grade (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-sed.html>) with programs in Science, Language Arts, Math Education, and Social Studies

- Special Education: Pre-K to 12th grade (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-sped.html>) with elementary specialization or secondary specialization with programs in Science, Language Arts, Math Education, and Social Studies

TEACHER EDUCATION PROGRAM (TEP)

Undergraduate teaching majors who approach the completion of 60 credits are eligible to apply for the Teacher Education Program (<https://tpal.nmsu.edu/admissions/tep-admission.html>) (TEP). To complete the degree (and become licensed to teach), undergraduate students must be admitted to the competitive TEP (<https://tpal.nmsu.edu/admissions/tep-admission.html>). Applicants who successfully complete the minimum requirements for TEP admission must submit a professional portfolio to be reviewed by the TEP Admission Committee.

The following minimum criteria must be met:

- GPA of 2.75 or higher
- Earn a C- or better in TEP prerequisites (see the packet for complete list)
- The candidate can apply to TEP as early as their 2nd semester of sophomore year. Candidates may submit their electronic portfolio during the semester in which they are enrolled in the last of the prerequisites.
- Candidates need to have completed at least 60 credits to start TEP coursework but can apply when finishing the last of those 60 credits
- The candidate must get a current degree check with a current date and signature from Dr. Margo Trevino-Torres in the College of Education Educational Support & Resource Center office in O'Donnell Hall #121 (call for an appointment – 575 646-3404).

The Undergraduate TEP Packet, explaining the components of the portfolio that are necessary to be considered for admission by the TEP (<https://tpal.nmsu.edu/admissions/tep-admission.html>) Admission Committee does not ensure admittance into any teaching program. Applicants are encouraged to develop a strong student portfolio, achieve the highest GPA possible and present the portfolio in a professional manner. Packets are also available at the Undergraduate Advisement Office of the College of Education, located in O'Donnell Hall, Room 121. Portfolio submission takes place twice a year 3rd Friday of September for the Fall and 3rd Friday of February for the Spring semester. For specific dates each semester, contact the Teacher Education Program office at (575) 646-2669 or the Undergraduate Advisement Office at (575) 646-3404. Applicants should be aware that admission to the TEP is competitive and admission is based upon available faculty resources.

STUDENT TEACHING

Student Teaching is the final semester of the degree, and is a requirement for licensure. Student Teaching (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html>) (STEP) portfolios are submitted one semester prior to the actual student teaching semester, and students must be admitted to the TEP in order to apply for student teaching. STEP Portfolio deadlines are 1st Friday in October for fall student teaching and 1st Friday in March for spring student teaching. STEP Portfolios are submitted electronically to the Teacher Education Program (TEP) office. For more information, visit the Student Teaching (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html>) website.

Non-Licensure Bachelor Programs

Two additional Bachelor degrees are available to undergraduate students who do not wish to obtain teacher licensure.

Bachelor of Applied Studies (Early Childhood Education Zero-Four Non-Licensure)

There is an identified need for prepared educators to serve young children from birth to four years of age in settings outside of the public school in childcare centers, Head Start, and other agencies. The School of TPAL offers a non-licensure concentration, with the Bachelor of Applied Studies degree for the Zero to Four years old Early Childhood Tract (<https://catalogs.nmsu.edu/nmsu/health-education-social-transformation/tpal/applied-studies-ztf-bas/>). This non-licensure concentration serves private and public childcare, early intervention programs, and Head Start.

The entry requirements and early coursework for the ECED Licensure and ECED Non-Licensure tracts are identical. During the first two years of the ECED programs, students concentrate on their general education requirements while also taking early childhood education classes. This professional education component acquaints students with the psychological, social, cultural, developmental, and cognitive aspects of early childhood. Students also begin to take field experience courses with child study requirements. Once students reach the 60 credit threshold, they can either opt for the Licensure tract by applying to the TEP or continue on with the Non-Licensure coursework.

Applied Studies students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. All ECED courses must be successfully completed with a grade of C- or better. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Bachelor of Science (Educational Leadership)

The Bachelor of Science (BS) in Educational Leadership (<https://ela.nmsu.edu/>) prepares students to work at the bachelor's level in areas such as university or community college career services, admissions, financial aid, and advising. This program develops educational leaders who are passionate about strengthening their leadership to improve student achievement and helps foster positive and sustained relationships with students, institutions, school districts and surrounding communities. This is a social justice-driven program geared to strengthen leadership skills for individuals involved in various educational disciplines. The non-licensure degree will provide graduates with abilities to lead in all facets of higher education. The program offers an innovative, structured approach to leadership in higher educational programs.

Undergraduate Minors

In addition to the Bachelor degrees, the School of TPAL also offers the following three undergraduate minors:

- Educational Leadership – Undergraduate Minor (<https://ela.nmsu.edu/academic-programs/under-grad-minor.html>)
- Early Childhood Education – Undergraduate Minor (<https://catalogs.nmsu.edu/nmsu/health-education-social-transformation/tpal/early-childhood-education-ug-minor/>)
- Secondary Education - Undergraduate Minor (p. 1299)

School of TPAL Graduate Programs

The School of TPAL offers numerous graduate programs and pathways for post-baccalaureate students. The following programs are listed in the order of Master of Arts degrees, Graduate Certificates, and Doctoral degrees.

Master of Arts Degrees

Master of Arts in Education

- MA/MAT in Education Programs Page (General information)
 - Master of Arts in Education Plus Licensure Concurrently (earn a teaching license in the areas of **Early Childhood, Elementary** or **Secondary Education** while earning a Master of Arts in Education degree)
 - Alternative Licensure
 - Master of Arts in Education (For licensed PK-12 teachers)
 - Master of Arts in Education (Non-Licensure)
 - Concentrations (for Non-Licensure):
 - Bilingual Education (BLED)
 - Early Childhood Education (ECED)
 - Education and Design with Learning Technology (EDLT)
 - Elementary Mathematics & Science Specialist (EMSS)
 - Multicultural Education (MCED)
 - Language, Literature and Culture (LLAC)
 - Teaching English to Speakers of Other Languages (TESOL)

Master of Arts in Special Education

- Master of Arts in SPED

Master of Arts in Educational Administration

- Master of Arts (M.A.) PLUS Licensure Program in Educational Administration- PK-12 program
- Master of Arts (M.A.) in Educational Administration – Community College and University Administration program

Master of Arts in Teaching

Concentration:

- Spanish

Graduate Certificates

Alternative Licensure

Graduate Certificate in Education and Design in Learning Technology

Visual Impairment Program

Graduate Certificate in Autism

Graduate Certificate in Autism

PK-12 licensure program

Doctoral Degrees

Doctor of Education

- Educational Administration (with concentration areas):
 - PK-12
 - Higher Education & University / Community College

Doctor of Philosophy

- Curriculum and Instruction (with concentration areas):
 - Bilingual Education
 - Multicultural Education
 - Early Childhood Education
 - Education and Design in Learning Technology
 - Language, Literature and Culture
 - Teaching English to Speakers of Other Languages (TESOL)
 - Special Education
- Educational Administration (with concentration areas):
 - PK-12
 - Higher Education & University / Community College

Degrees for the Department

Bachelor Degree(s)

- Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies (p. 1266)
- Early Childhood Education - Bachelor of Science in Education (p. 1269)
- Educational Leadership - Bachelor of Science (p. 1271)
- Elementary Education (Language Arts K-8) - Bachelor of Science in Education (p. 1272)
- Elementary Education (Math K-8) - Bachelor of Science in Education (p. 1274)
- Elementary Education (Science K-8) - Bachelor of Science in Education (p. 1276)
- Elementary Education (Social Studies K-8) - Bachelor of Science in Education (p. 1277)
- Secondary Education (Secondary Education General Science) - Bachelor of Science in Education (p. 1278)
- Secondary Education (Secondary Education Language Arts) - Bachelor of Science in Education (p. 1281)
- Secondary Education (Secondary Education Math) - Bachelor of Science in Education (p. 1283)
- Secondary Education (Secondary Education Social Studies) - Bachelor of Science in Education (p. 1286)
- Special Education (Elementary Education) - Bachelor of Science in Education (p. 1288)
- Special Education (Secondary Education) - Bachelor of Science in Education (p. 1290)
- Special Education (Secondary Education) - Bachelor of Science in Education (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/special-education-secondary-education-bsed-online/>)

Master Degree(s)

- Education (Bilingual Education) - Master of Arts (p. 129)
- Education (Curriculum & Instruction) - Master of Arts (p. 130)
- Education (Curriculum & Instruction) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-curriculum-instruction-ma-online/>)
- Education (Early Childhood Education Plus Licensure) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-early-childhood-ed-plus-licensure-ma-online/>)
- Education (Early Childhood Education Plus Licensure) - Masters of Arts (p. 131)
- Education (Early Childhood Education) - Master of Arts (p. 130)

- Education (Early Childhood Education) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-early-childhood-ed-ma-online/>)
- Education (Educational Learning Technologies) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-educational-learning-technologies-ma-online/>)
- Education (Elementary Licensure Prep) - Master of Arts (p. 131)
- Education (Elementary Licensure Prep) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-elementary-licensure-prep-ma-online/>)
- Education (Elementary Mathematics and Science) - Master of Arts (p. 132)
- Education (Language, Literacy & Culture) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-language-literacy-culture-ma-online/>)
- Education (Language, Literacy, & Culture) - Master of Arts (p. 133)
- Education (Secondary Licensure Prep) - Master of Arts (p. 133)
- Education (Secondary Licensure Prep) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/education-secondary-licensure-prep-ma-online/>)
- Education (Spanish) - Master of Arts in Teaching (p. 135)
- Education (Teaching English to Speakers of Other Languages) - Master of Arts (p. 135)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (p. 136)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (p. 136)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/educational-leadership-administration-higher-ed-admin-ma-online/>)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/educational-leadership-administration-pk12-admin-ma-online/>)
- Special Education - Master of Arts (p. 167)
- Special Education - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/special-education-ma-online/>)

Doctorate Degree(s)

- Curriculum and Instruction - Doctor of Philosophy (p. 182)
- Curriculum and Instruction - Doctor of Philosophy (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/curriculum-instruction-phd-online/>)
- Educational Leadership & Administration (Higher Education Administration) - Doctor of Education (p. 184)
- Educational Leadership & Administration (Higher Education) - Doctor of Philosophy (p. 185)
- Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education (p. 186)
- Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy (p. 186)

Minors for the Department

- Africana Studies - Undergraduate Minor (p. 1298)
- Early Childhood Education - Undergraduate Minor (p. 1298)

- Educational Administration (Doctoral) - Graduate Minor (p. 213)
- Educational Administration (Higher Ed.) - Graduate Minor (p. 213)
- Educational Administration (Pk-12) - Graduate Minor (p. 213)
- Educational Leadership and Administration - Undergraduate Minor (p. 1299)
- Secondary Education - Undergraduate Minor (p. 1299)
- Special Education - Graduate Minor (p. 220)

Graduate Certificate(s)

- Autism and Spectrum Disorders - Graduate Certificate (p. 204)
- Bilingual Education - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/bilingual-education-gr-certificate-online/>)
- Early Childhood Alternative Licensure - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/early-childhood-alt-licensure-gr-cert-online/>)
- Elementary Education Alternative Licensure - Graduate Certificate (p. 207)
- Online Teaching and Learning - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/online-teaching-learning-gr-certificate-online/>)
- Principal Licensure - Graduate Certificate (p. 208)
- Secondary Education Alternative Licensure - Graduate Certificate (p. 209)
- Special Education Alternative Licensure - Graduate Certificate (p. 210)
- Teaching English to Speakers of Other Languages - Graduate Certificate (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/tesol-gr-certificate-online/>)

School of Teacher Preparation, Administration, and Leadership (TPAL):

Associate Professor, Rick Marlatt, M.F.A., Ph.D., Director, School of Teacher Preparation, Administration, and Leadership

Professors: Araujo, Baptiste, Haynes Writer, A. Hernandez, Osanloo; **Associate Professors:** Fahrenbruck, Flores Carmona, Guillaume, Huerta-Charles, Marlatt, Parra, Rutledge, Salas; **Assistant Professors:** Gray, Ibarra Johnson, Kew, Lucero, Matute-Chavarria, Neville, Pando, Pedraza, Schulz, Thomas, Warr, Wiegand; **College Professor:** Cifuentes; **College Associate Professors:** Gorham-Blanco, Hannan, C. Hernandez; **College Assistant Professors:** Henderson, Mason, Moreno; **College Instructors:** Martinez-Griego, Owens; **Emeritus Professors:** Armendáriz, Cahill, Chavez-Chavez, Dominguez, González, Ivory, Reyes, Torres, Townley, Wiburg

B. Araujo, Ph.D. (New Mexico State University) - teacher education, social studies, bilingual education; **H. P. Baptiste, Ed.D.** (Indiana University) - science elementary; **L. Cifuentes, Ph.D.** (University of North Carolina, Chapel Hill) - learning and instructional design, educational technologies, collaborative learning; **M.L. Fahrenbruck, Ph.D.** (University of Arizona) - language, reading & culture; **J. Flores-Carmona, Ph.D.** (University of Utah) - culture and society, sociology of education; **T. Gorham Blanco, Ph.D.** (University of Wyoming) - mathematics education and pre-service teacher preparation; **P. Gray, Ed.D.** (University of Texas-San Antonio) - principalship, culturally responsive leadership, race and leadership; **R. Guillaume, Ph.D.** (New Mexico State University) - student development theory, biracial/multicultural identity development, higher education administration; **J.M. Hannan, Ph.D.** (New Mexico State University) - distance education administration, best practices in teaching distance education, student services for distance education students; **J.L. Haynes Writer, Ph.D.** (University of New Mexico) - critical multicultural & social justice education,

Indigeneity, Native American education teacher preparation; V. Henderson, Ph.D. (New Mexico State University)-teacher education; language, literacy, and culture; bilingual education; **A. Hernandez, (Stanford University)** - elementary literacy, sociolinguistics, biliteracy-multiliteracy, and teacher professional development; **C.M. Hernandez, Ph.D.** (Kansas State University) - science education; **L. Huerta-Charles, Ph.D.** (New Mexico State University) - multicultural/bilingual education; **S. Ibarra-Johnson, Ph.D.** (University of New Mexico) - bilingual education, bi/multilingual development, translanguaging pedagogy; **K. Kew, Ph.D.** (Boston College) - educational change and reform, educational leadership, school culture, micro-politics; **L. Lucero** (University of Texas-El Paso) - teaching, learning, and culture, with a concentration in math/science, technology/LGBTQ+studies; **Barbara Martinez-Griego, Ph.D.** (New Mexico State University) - Bilingual education/leadership/cultural and linguistic responsive education and practices, intersectionality; **R. Marlatt, Ph.D.** (University of Nebraska-Lincoln) - language, literacy and culture; **L. Mason, Ed.D.** (University of Northern Colorado) - visual impairment, orientation and mobility, literacy; **M. Matute-Chavarria, Ph.D.** (University of Nevada, Las Vegas) - special education, culturally responsive practices, and the intersections of race, disability, and family; **Y. Moreno, Ph.D.** (New Mexico State University) - low incidence disabilities, Autism, classroom management, and transition; **M. Neville, Ph.D.** (Michigan State University) - secondary English, language, and literacy teacher education; equity-oriented curriculum and instruction; **A.F. Osanloo, Ph.D.** (Arizona State University) - educational equity, educational leadership and policy, social justice leadership; critical race theory; **A. Owens, Ph.D.** (University of Texas at El Paso) - literacy/bi-literacy, educational equity in special education awareness for teachers and principals; **A. Owens, Ph.D., (New Mexico State University)** literacy/bi-literacy, educational equity in special education for learners and caregivers, teacher/administrator preparation related to early childhood/e.elementary, Glass Family Research Institute for Early Childhood Studies Director; **M. Pando, Ph.D.** (Texas Tech University) - bilingual education; **J.L. Parra, Ed.D.** (Pepperdine University) - online teaching & learning; technology integration; teacher/ faculty professional development, innovative & transformative education; **C. A. A. Pedraza, Ph.D.** (New Mexico State University) - Asians and Asian Americans in higher education, reflexivity and positionality, racial and ethnic identity construction, and master narratives; **D. Rutledge, Ph.D.** (University of Colorado-Boulder) - learning technologies, international education, bilingual education/TESOL; **L. Salas, Ph.D.** (New Mexico State University) - bilingual and multicultural special education, early childhood special education; **R. Thomas, Ph.D.** (University of Missouri-Kansas City) - early childhood education, critical literacy; auto-ethnography; **M. Warr, Ph.D.** (Arizona State University) - teacher education, design, creativity, and technology; **S. Wiegand, Ph.D.** (University of Georgia) - autism spectrum disorder, early intervention, and professional development

Emeritus Professors

A.L. Armendáriz, Ph.D. (University of New Mexico - emeritus)- school administration, leadership development, organizational theory; **E. Cahill, Ph.D.** (Kent State University)- early childhood education, community education; **R. Chavez Chavez, Ph.D.** (New Mexico State University - emeritus)- curriculum theory, foundations, and multicultural education; **R. Dominguez, Ph.D.** (New Mexico State University - emeritus)- educational administration, higher education, community college administration, leadership development; **M.L. González, Ph.D.** (New Mexico State University)- leadership in public school administration, multicultural organizations; **L.V. Reyes, Ph.D.** (New Mexico State University - emeritus)- early childhood education and critical pedagogy; **C.T. Townley, Ph.D.** (University of Michigan - emeritus)- knowledge management, higher education; **M. Torres, Ph.D.** (University of New Mexico - emeritus)- critical theory, research as praxis; **K. Wiburg, Ed.D.** (International University - emeritus)- technology, learning design, mathematics education.

Early Childhood Education Courses

ECED 1110. Child Growth, Development, and Learning

3 Credits (3)

This basic course in the growth, development, and learning of young children, prenatal through age eight, provides students with the theoretical foundation for becoming competent early childhood professionals. The course includes knowledge of how young children grow, develop and learn. Major theories of child development are integrated with all domains of development, including biological-physical, social, cultural, emotional, cognitive and language. The adult's role in supporting each child's growth, development and learning is emphasized. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of developmental stages, processes, and theories of growth, development, and learning into developmentally appropriate practice. A.one
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child. A.two
3. Demonstrate knowledge of the significance of individual differences in development and learning.
4. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays and/or specific disabilities. A.three
5. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse abilities. A.four
6. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
7. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
8. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
9. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten 1
10. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven

ECED 1115. Health, Safety, and Nutrition

2 Credits (2)

This course provides information related to standards and practices that promote children's physical and mental well-being sound nutritional practices, and maintenance of safe learning environments. It includes information for developing sound health and safety management procedures for indoor and outdoor learning environments for young children. The course examines the many scheduling factors that are important for children's total development, healthy nutrition, physical activity, and rest. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
2. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially and emotionally). B.two
3. Use appropriate health appraisal and management procedures and makes referrals when necessary. B.three
4. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
5. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five
6. Provide a consistent daily schedule for rest/sleep, as developmentally appropriate. B.six
7. Implement health care and educational activities for children and families based on health and a.nutritional information that is responsive to diverse cultures. B.seven
8. Assist young children and their families, as individually appropriate, in developing decision-making and interpersonal skills that enable them to make healthy choices and establish health-promoting behaviors. B.eight

ECED 1120. Guiding Young Children**3 Credits (3)**

This course explores various theories of child guidance and the practical applications of each. It provides developmentally appropriate methods for guiding children and effective strategies and suggestions for facilitating positive social interactions. Strategies for preventing challenging behaviors through the use of environment, routines and schedule will be presented. Emphasis is placed on helping children become self-responsible, competent, independent, and cooperative learners and including families as part of the guidance approach. May be repeated up to 3 credits.

Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture and society. A.six
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
3. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten
4. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
5. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
6. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
7. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths, expectations, values, and child-rearing practices. C.four
8. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
9. Demonstrate knowledge and skills in developmentally appropriate guidance techniques and strategies that provide opportunities to assist children in development positive thoughts and feelings about themselves and others through cooperative interaction with peers and adults. E.three 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this

ECED 1125. Assessment of Children and Evaluation of Programs**3 Credits (3)**

This basic course familiarizes students with a variety of culturally appropriate assessment methods and instruments, including systematic observation of typically and non-typically developing children. The course addresses the development and use of formative and summative assessment and evaluation instruments to ensure comprehensive quality of the total environment for children, families, and the community. Students will develop skills for evaluating the assessment process and involving other teachers, professionals and families in the process. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Learning Outcomes

1. Demonstrate ability to choose valid tools that are developmentally, culturally, and linguistically appropriate; use the tools correctly; make appropriate referrals; and interpret assessment results, with the goal of obtaining valid, useful information to inform practice and decision making. F.one
2. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguard confidentiality and privacy. F.two
3. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for Individual family service plans (IFSP) and individual education plans (IEP). F.three
4. Demonstrate understanding of the influences of environmental factors, cultural/linguistic differences, and diverse ways of learning on assessment outcomes. F.four
5. Involve the family and, as appropriate, other team members in assessing the child's development, strengths, and needs in order to set goals for the child. F.five
6. Articulate an understanding of the distinctions and definitions of assessment concepts (e.g., screening, diagnostic assessment, standardized, testing, accountability assessment). F.six
7. Apply understanding of assessment concepts toward selection of appropriate formal assessment measures, critiquing the limitations of inappropriate measures, and discussing assessment issues as part of interdisciplinary teams. F.seven
8. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional. It standards is collaborative and open with the goal of supporting diverse children and families. F.eight
9. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the Application of this data to curriculum development and/or intervention planning. F.nine 1
10. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
11. Demonstrate knowledge and use of program evaluation to ensure comprehensive quality of the total Environment for children, families, and the community. F.eleven 1
12. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve

ECED 1130. Family and Community Collaboration**3 Credits (3)**

This beginning course examines the involvement of families and communities from diverse cultural and linguistic backgrounds in early childhood programs. Ways to establish collaborative relationships with families in early childhood settings is discussed. Families' goals and desires for their children will be supported through culturally responsive strategies. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Learning Outcomes

1. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
2. Articulate an understanding of a safe and welcoming environment for families and community members. C.two
3. Develop and maintain ongoing contact with families through a variety of communication strategies. C.three
4. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths, expectations, values, and child-rearing practices. C.four
5. Articulate understanding of the complexity and dynamics of family systems. C.five
6. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
7. Involve families and community members in contributing to the learning environment. C.nine
8. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
9. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions; family structures, relationships, stressors, and supports (including the impact of having a child with diverse abilities); home language and ethnicity. C.twelve 1
10. Demonstrate knowledge of and skill to access community resources that assist families and contribute directly or indirectly to children's positive development such as mental health services, health care, adult education, English language instruction, and economic assistance. C.thirteen 1
11. Demonstrate effective written and oral communication skills when working with children, families, and early care, education, and family support professionals. E.fourteen 1
12. Demonstrate a commitment to leadership and advocacy for excellence in programs and services for young children and their families. G.six

ECED 2110. Professionalism**2 Credits (2)**

This course provides a broad-based orientation to the field of early care and education. Early childhood history, philosophy, ethics and advocacy are introduced. Basic principles of early childhood systems are explored. Multiple perspectives on early care and education are introduced. Professional responsibilities such as cultural responsiveness and reflective practice are examined. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
2. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
3. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve
4. Demonstrate ability to adhere to early childhood professional codes of ethical conduct and issues of confidentiality. G.one
5. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two
6. Demonstrate understanding of conditions of children, families, and professionals; the historical and current issues and trends; legal issues; and legislation and other public policies affecting children, families, and programs for young children and the early childhood profession. G.three
7. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four
8. Demonstrate understanding of the early childhood profession, its multiple historical, philosophical, and social foundations, and how these foundations influence current thought and practice. G.five
9. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven

ECED 2115. Introduction to Language, Literacy, and Reading **3 Credits (3)**

This course is designed to prepare early childhood professionals for promoting children's emergent literacy and reading development. Through a developmental approach, the course addresses ways in which early childhood professionals can foster young children's oral language development, phonemic awareness, and literacy problem solving skills, fluency, vocabulary, and comprehension. This course provides the foundation for early childhood professionals to become knowledgeable about literacy development in young children. Instructional approaches and theory-based and research based strategies to support the emergent literacy and reading skills of native speakers and English language learners will be presented. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H, or ENGL 1110M).

Learning Outcomes

1. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
2. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
3. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
4. Develop partnerships with family members to promote early literacy in the home. C.eight
5. Establish partnerships with community members in promoting literacy. C.ten
6. Demonstrate knowledge of the reading and writing components of emergent literacy at each developmental level. D.four
7. Provide and use anti-bias materials/literature and experiences in all content areas of the curriculum. D.seven
8. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E.nine
9. Use a variety of strategies during adult-child and child-child interactions and facilitate communication and dialogue of expressive language and thought. E.ten 1
10. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of literacy skills. E.eleven

ECED 2120. Curriculum Development through Play Birth through Age 4 (PreK) **3 Credits (3)**

The beginning curriculum course places play at the center of curriculum in developmentally appropriate early childhood programs. It addresses content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2121.

Learning Outcomes

1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
2. Demonstrate knowledge of relevant content for young children and developmentally appropriate ways of integrating content into teaching and learning experiences for children from birth to four years of age. D.one
3. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.two
4. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.six
5. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.one
6. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two
7. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
8. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
9. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight 1
12. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E.eleven 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. E

ECED 2121. Curriculum Development through Play Birth through Age 4 (PreK) Practicum**2 Credits (2)**

The beginning practicum course is a co-requisite with the course Curriculum Development through Play – Birth through Age 4. The field based component of this course will provide experiences that address curriculum content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 2 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2120.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight

ECED 2130. Curriculum Development and Implementation Age 3 (PreK) through Grade 3**3 Credits (3)**

The curriculum course focuses on developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills, is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEP's is included. Consent of instructor required. May be repeated up to 3 credits.

Prerequisite: ECED 1110, ECED 2120 and ECED 2121 (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2131.

Learning Outcomes

1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.Eleven
2. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.Two
3. Demonstrate knowledge of what is important in each content area, why it is of value, and how it links with early and later understandings within and across areas. D.Three
4. Demonstrate knowledge of the language, reading and writing components of emergent literacy at each developmental level. D.Four
5. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.Six
6. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.One
7. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.Two
8. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
9. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five 1
10. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six 1
11. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.Twelve 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. F.Nine

ECED 2131. Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum**2 Credits (2)**

The beginning practicum course is a co-requisite with the course Curriculum Development and Implementation: Age 3 through Grade 3. The field based component of this course will provide experiences that address developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEPs is included. Consent of instructor required. May be repeated up to 2 credits.

Prerequisite: ECED 1110 (ENGL 1110G or ENGL 1110H or ENGL 1110M), ECED 2120, and ECED 2121.

Corequisite: ECED 2130.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.Five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.Five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.Seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.Eight

ECED 2140. Effective Program Development for Diverse Learners and their Families**3 Credits (3)**

This course addresses the role of a director/administrator in the implementation of family-centered programming that includes individually appropriate and culturally responsive curriculum in a healthy and safe learning environment for all children and their families. May be repeated up to 3 credits.

Learning Outcomes

1. Describe important aspects of leadership that an administrator in an early childhood setting must demonstrate.
2. Identify and describe ways in which classrooms can have a multicultural environment.
3. Observe a classroom and identify, using photographs good practice with classroom environment.
4. Describe important aspects of a good early childhood curriculum
5. Describe how culture and socioeconomic factors influence classroom environment.

ECED 2141. Effective Program Development for Diverse Learners and their Families Practicum**2 Credits (2)**

Provides opportunities for students to apply knowledge gained from Curriculum for Diverse Learners and their Families in a practicum setting. Consent of instructor required. Restricted to ECED majors. May be repeated up to 2 credits.

Corequisite: ECED 2140.

Learning Outcomes

1. Describe the requirements to maintain and enhance the physical and mental health, safety, and nutrition components of a program: Demonstrate knowledge of facility management to include evaluation, maintenance, security, and meeting applicable codes; Demonstrate knowledge of planning for appropriate indoor and outdoor environments; Identify ways to support early childhood educators in the selection of appropriate materials and equipment for the environment; Demonstrate knowledge of the impact of the environment on children's learning and development.
2. Demonstrate knowledge of early care and education curriculum that is individually, culturally, linguistically, and developmentally responsive: Describe a variety of curriculum goals and teaching strategies; Describe the importance of ongoing curriculum assessment and planning, and collaboration with teachers, families and community entities; Identify ways to support early childhood educators in curriculum assessment and planning.
3. Demonstrate knowledge of family/community involvement in effective program development: Describe the importance of supporting families as partners in early care and education program development; Describe both informal and formal communication systems with families that encourage information sharing and joint decision making; Identify strategies for resolving conflicts and supporting families with diverse backgrounds and parenting expectations; Identify the range of family needs including transitional periods; Identify within the community the network to support families with their special needs; Describe a "family friendly" inclusive philosophy
4. Demonstrate knowledge of a director's role as an educational leader in an inclusive setting: Describe what a director does in supporting the instructional component of the program for children, staff, and families; Identify resources that a director might use to keep current with information relating to the instructional component of the program; Describe ways to involve teachers in instructional decision making.

ECED 2215. Program Management**3 Credits (3)**

This course emphasizes the technical knowledge necessary to develop and maintain an effective early care and education program. It focuses on sound financial management and vision, the laws and legal issues that affect programs, and state and national standards such as accreditation. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Develop a comprehensive program philosophy.
2. Demonstrate the ability to develop systems that are effective for quality program operation.
3. Create a program budget and understand the Income and Expense sides and what affects each part.
4. Model best practices that integrate various leadership styles.

ECED 2280. Professional Relationships**3 Credits (3)**

This course addresses staff relations that will foster diverse professional relationships with families, communities and boards. Topics of staff recruitment, retention, support and supervision will lay the foundation for positive personnel, family and community relationships. Consent of instructor required. May be repeated up to 3 credits.

Corequisite: ECED 2281.

Learning Outcomes

1. Interview an administrator and write a paper describing personnel management, staff support, supervision, and professional development.
2. Identify and describe ethical and legal requirements in maintaining a professional relationship with subordinates, the community, clients, and fellow administrators.
3. Identify and describe technologies which may be used in an early childhood setting.
4. Identify and describe legal and ethical considerations in the employment of others.

ECED 2281. Professional Relationships Practicum**2 Credits (2)**

Practical experience in the development of staff relationship that will foster professional relationships with families, communities and boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Consent of instructor required. Restricted to ECED majors.

Corequisite(s): ECED 2280.

Learning Outcomes

1. Demonstrate knowledge of personnel management, staff support, supervision, and professional development within a diverse and inclusive organization: Describe methods for recruiting and retaining a diverse staff; Describe job descriptions for each position; Review a sampling of personnel policies and procedures; Review a variety of staff handbooks; Explain why on-going system of supervision should include regular meetings for professional goal setting, self-assessment, and feedback; Review program needs to effectively manage the work of the program including scheduling, covering ratios, initial orientation, in-service, staff meeting, etc.
2. Demonstrate an awareness of appropriate communication and collaboration skills: Improve written and oral communication skills; Describe strategies for resolving conflicts; Explain how to promote consensus building as a decision making process.
3. Demonstrate knowledge that promotes effective professional relationships with families, communities, and board members: Describe methods for demonstrating respect, understanding, and appreciation for all people; Identify the aspects of culture that facilitate relationship building among people; Describe how to build a common vision and develop long range program plans with parents, staff, board, and the community; Communicate program goals to visitors, prospective parents, volunteers, and board members; Describe how public relations and marketing strategies can impact programs; Review assessment tools that identify needs for early care, education and family support; Develop a personal professional development plan; Describe methods to work effectively with a board and advisory group.
4. Demonstrate knowledge of technology uses and skill acquisition: Describe how to use technology resources to engage in ongoing professional development and lifelong learning; Describe how you will use technology to communicate and collaborate in your leadership role

ECED 3110. Research in Child, Growth, Development and Learning**3 Credits (3)**

This advanced course in child growth, development, and learning builds upon the foundational material covered in the basic course in child growth, development, and learning. An integration of major theories of child development is provided by focusing on contemporary research in all aspects of development, including bio-ecological, social-affective, cognitive, language, and the methodological aspects of research in early childhood development and education. Restricted to ECED majors (TEP and Zero-to-Four) and ECED minors. May be repeated up to 3 credits.

Prerequisite: ECED 1110;.

Learning Outcomes

1. Incorporate understanding of developmental stages, processes and theories of growth, development, and learning into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child

ECED 3120. Family, Language, and Culture**3 Credits (3)**

This course analyzes the interrelationships between family, language, and culture as connected to children's development and learning. In this course, language is understood as a human activity and higher mental process which build on the children's families, community, and cultural background. Restricted to: ECED majors (TEP and Zero-to-Four) and ECED minors. May be repeated up to 3 credits.

Prerequisite: ECED 1130.

Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society. A.6
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.7

ECED 3210. Emergent Literacy**3 Credits (3)**

This advanced course is designed to prepare early childhood professionals to study literacy development, specifically oral language, writing and reading. This course focuses on children from birth through age 4, including children with special needs. Through a developmental approach, the course addresses: 1) recent theory and research that translates into practical strategies, assessment materials and preparation of rich literacy environments, 2) the socio-cultural contexts in which children develop literacy, 3) culturally, linguistically and developmentally appropriate literacy curricula, 4) processes used to determine the appropriateness of various literacy strategies, 5) assessment, evaluation, and accountability and 5) literacy leadership. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.

Prerequisite: ECED 2115.

Learning Outcomes

1. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A. eight
2. Knowledge of how children acquire and use verbal, non-verbal and alternative means of communication. A. nine
3. Develop partnerships with family members to promote early literacy in the home. C. eight
4. Establish partnerships with community members in promoting literacy. C. ten
5. Knowledge of the language, reading and writing components of emergent literacy at each developmental level. D. four
6. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E. nine
7. Use a variety of language strategies during adult-child and child-child interactions and facilitate dialogue of expressive language and thought. E. ten
8. A variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E. eleven
9. Demonstrate and facilitate conceptual understanding of family roles in the development of their infant and toddler, including support for family acquisition of knowledge concerning infant and toddler's growth, learning and development and cultural and linguistic diversity represented within the home setting. H. one 1
10. Apply theoretical knowledge f and ability to provide screening and assessment unique for infants and toddlers. H. two 1
11. Articulate and demonstrate conceptual understanding of respectful, responsive, and reciprocal interactions that serve as basis for infant/toddler curriculum and learning environments. H. five 1
12. An understanding and applications of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I. three 1
13. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills. I. five 1
14. Establish priorities for high-quality and meaningful language and pre-literacy experiences across the developmental continuum, using language, pre-reading and pre-writing to facilitate skill development while strengthening children's cultural identity. I. eleven 1
15. Knowledge of second- language acquisition and bilingualism including the diversity of home language environments. I. twelve
Conceptual knowledge of the principles and standards derived from professional organizations for curriculum decision- making. I. fifteen

ECED 3996. Special Topics**1-3 Credits (1-3)**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

ECED 4110. Young Children with Diverse Abilities**3 Credits (3)**

Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 5110. Restricted to ECED majors (TEP and Zero-to-Four) and ECED Minors. May be repeated up to 3 credits.

Prerequisite: SPED 3105.

Corequisite: ECED 4120.

Learning Outcomes

1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities.

ECED 4120. Assessment of Young Children, Birth-Eight**3 Credits (3)**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Restricted to ECED Majors (TEP and Zero-to-Four) and ECED Minors. May be repeated up to 3 credits.

Prerequisite: SPED 3105.

Corequisite: ECED 4110.

Learning Outcomes

1. Understand the technical aspects of early childhood assessments
2. Conduct and utilize assessments
3. Collaborate with other professionals

ECED 4210. Integrated Early Childhood Curriculum**4 Credits (4)**

This advanced course focuses on developmentally appropriate content, learning environments, and curriculum implementation for children birth through age 4. It emphasizes integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to: Zero-to-Four majors. May be repeated up to 4 credits.

Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, and ECED 1120.

Corequisite: ECED 4211.

Learning Outcomes

1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D. five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E. four

ECED 4211. Integrated Curriculum Practicum**2 Credits (2)**

The advanced practicum course is a field based course that will provide opportunities for the integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to Zero-to-Four majors. May be repeated up to 2 credits.

Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, ECED 1120.

Corequisite: ECED 4210.

Learning Outcomes

1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
3. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
4. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight
5. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I.three

ECED 4220. Advanced Caregiving for Infants and Toddlers**3 Credits (3)**

The advanced field-based course is intended to assist students to define and implement advanced elements of quality programming for all infants, toddlers in safe, healthy, responsive caring environments. The experiences in the approved setting will support strong nurturing relationships, cultural competence, diverse learning needs and styles of every child, appropriate guidance techniques and partnership with the families, cultures, and community represented. Students are assisted through the course in advancing their ability to observe, discuss, and implement elements of quality programming for infants and toddlers in home, small-group or whole-group care situations. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.

Prerequisite: ECED 2120 and ECED 2121; ECED 2130 and ECED 2131.

Learning Outcomes

1. The primary goal of your participation in this course is to develop an increased understanding of infant/toddler (Birth through age three) development and developmentally appropriate care/education practices.

ECED 4250. Teaching and Learning Math and Science**4 Credits (4)**

Standards, principles, and practices in teaching mathematics and science to young children in preschool through grade 3. An emphasis is placed on developing a content-rich integrated math and science curriculum that focuses on children's development and interests, includes appropriate content, processes, environment, and materials with an emphasis on problem-solving as the major means of constructing basic concepts. Field experience required. Restricted to: TEP-ECED majors. May be repeated up to 4 credits.

Corequisite: ECED 4310, ECED 4260, ECED 4320.

Learning Outcomes

1. The arithmetic of real numbers and their subsets of rational numbers, integers, and whole numbers including a large repertoire of interpretations of the four basic operations and ways they can be applied, and an understanding of place value and its implications for ordering numbers and estimation. H.two.a.i
2. Three dimensional geometry based on the concept of distance, and two dimensional geometry as a method of drawing plans and representing three dimensional objects H.two.a.ii
3. Measurement of length, perimeter, area, time, weights, and temperature H.two.a.iii
4. Handling money problems such as cost and unit price. H two.a.iv
5. Demonstrate understanding and skill in the constructions of solids, measurements of their volumes and surface areas, drawing their projections, and making plans for their construction; defining relevant variables and writing formulas describing their relationships in problem-solving activities; and using measurement tools and appropriate techniques for recording data and displaying results. H two.b
6. Facilitate curriculum with open-ended activities that promote children's expansion of the material learned, and in which children learn to use a variety of mathematical skills and concepts, including problem solving, reasoning, and logic. H.two.c
7. Provide opportunities for children to learn how to use tools, technology, and manipulatives in problem solving. H two.d
8. Establish a classroom environment of respect for cultural diversity and gender equity in which all children develop skills in communicating, discussing, and displaying mathematical ideas. H two.e
9. Demonstrate understanding and apply the fundamental concepts in the subject matter of science including physical, life, and earth and space sciences as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry process scientists use in discovery of new knowledge to build a base for scientific inquiry. H two.a 1
10. Apply the scientific method to develop children's abilities to identify and communicate a problem, and to design, implement, and evaluate a solution. H three.b 1
11. Demonstrate the ability to integrate a variety of technologies into planned science activities. H three.c 1
12. Establish a classroom environment of respect for cultural diversity and gender equity where all children participate fully in science learning. H three.d Support play in young children's learning and development from age Pre-K-grade three. I.six 1
13. Demonstrate sound knowledge and skills in using technology as a teaching and learning tool. I.seven 1
14. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards. I.nine 1
15. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for

ECED 4260. Teaching and Learning Social Studies, Fine Arts and Movement**3 Credits (3)**

The course focuses on the aims, scope, and integration of methods of teaching social studies, the fine arts and movement across the curriculum. This course emphasizes an integrated approach to teaching the what and why of social studies; assessing student learning; planning units, lessons, and activities; effective instructional strategies; and knowledge of social studies content. Concepts of expressive art include the visual arts, music, movement and drama. Restricted to: TEP-ECED majors. May be repeated up to 3 credits.

Corequisites: ECED 4310, ECED 4250, ECED 4320.

Learning Outcomes

1. Demonstrate an understanding of the principles of teaching and learning processes that underscore social studies concepts and can translate these into meaningful learning activities focusing on inquiry, authenticity, and collaboration. H.four.a
2. Demonstrate understanding that social studies encompass history, geography, anthropology, archeology, economics, political science, psychology, sociology, and the interdisciplinary relationship of all facets of social studies. H.four.b
3. Demonstrate understanding that the definition of social studies requires that children be socially aware of and are active participants in local, state, national, and global issues; and that children recognize and respect diverse local and global perspectives concerning cultures other than their own. H.four.c
4. Implement a variety of teaching strategies to assist children to use multiple resources including primary (e.g., documents, artifacts/regalia, direct observation, human resources, personal background) and secondary (e.g., books, newspapers, internet) as part of the inquiry/research process. H.four.d
5. Create curriculum experiences that provide opportunities for children to appreciate the historical development of democratic values, institutions, nations, and cultures. H.four.e
6. Demonstrate the ability to plan for and engage children in activities that require them to formulate, analyze, synthesize, and critique issues by using well-reasoned, clearly supported arguments, policies, and positions. H.four.f
7. Demonstrate the ability to plan for and engage children in the presentation of social studies knowledge using a variety of sign systems including writing, charts, graphs, maps, art, music, drama, dance, and technology. H.four.g
8. Demonstrate an understanding and implementation of arts activities such as history, art making, appreciation, and criticism through dance, music, theater, and the visual arts, appropriate to young children's developmental levels interests. H.five.
9. Demonstrate knowledge of the distinctions, connections, and integration between arts disciplines and arts experiences and encourages study and active participation that leads to skill development and appreciation. H.five.b 1
10. Facilitate curriculum in which children communicate at a basic level in the four (4) art disciplines of dance, music, theater, and visual arts, including knowledge and skills in the use of basic vocabularies, materials, tools, techniques, and thinking processes of each discipline. H.five.c 1
11. Create a classroom environment with exemplary works of art from a variety of cultures and historical periods and provide opportunities for students to discuss and respond to them. H.five.d 1
12. Demonstrate an understanding of motor skill development in young children and apply knowledge of age and developmentally appropriate psychomotor and cognitive activities. H.five.e 1
13. Create and use appropriate instructional cues and prompts for motor skills, rhythms, and physical activity. H.five.f 1

ECED 4310. Early Primary Field Placement**2 Credits (4P)**

The field practicum is a co-requisite course with Teaching and Learning Reading and Writing; Teaching and Learning Math and Science; Teaching and Learning Social Studies, Fine Arts and Movement. The field based component will provide experiences that address curriculum content and practice teaching that is relevant for early primary children in developmentally and culturally sensitive ways. Graded: S/U Grading (S/U, Audit). Restricted to: TEP-ECED majors. May be repeated up to 2 credits.

Corequisite: ECED 4250, ECED 4260, ECED 4320.

Learning Outcomes

1. Demonstrate the ability to work collaboratively with educational assistants, volunteers, and others to individualize the curriculum and to meet program goals.
2. Demonstrate skill in collaboration with professionals from other disciplines (e.g., mental health, psychology, speech and language) when planning curriculum and teaching strategies for young children with diverse abilities.
3. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to an adult-directed and from free exploration to scaffolded support or teacher modeling.
4. Apply an understanding of young children's need for balance, order, depth, variety, and challenge through curriculum planning, routines, and scheduling (e.g., daily, weekly, and longer-term).
5. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills.
6. Apply knowledge to create environments that enrich and extend children's play including intervention strategies (i.e., questioning), respect of cultural diversity and gender equity. Support play in young children's learning and development from age Pre-K - grade three.
7. Demonstrate the ability to promote positive social interactions and engage children in learning activities while actively working to increase social and emotional competence of all children.
8. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards.
9. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
10. Demonstrate conceptual knowledge of the principles and standards derived from professional content organizations (zero to three, NAEYC, DEC) for curriculum-decision making. Demonstrate the use of reflective practice.

ECED 4320. Teaching and Learning Reading and Writing
3 Credits (3)

The foundation of this course is on understanding the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature. Restricted to: TEP-ECED majors. May be repeated up to 3 credits.

Prerequisite: ECED 2115.

Corequisite: ECED 4310, ECED 4250, ECED 4260.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? ; Is that different from literacy outside of school?; How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 4810. Student Teaching/Seminar Early Childhood
3 Credits (3)

Discussion of early childhood school issues related to student teaching. May be repeated up to 3 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

ECED 4996. Topics
3 Credits (3)

Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

ECED 4998. Field Experience (Infants Pre-K)
1 Credit (1)

Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. May be repeated up to 1 credit.

Learning Outcomes

1. Engage in an ECED field experience.

**ECED 5110. Working with Young Children with Special Needs, Ages 3-8
3 Credits (3)**

Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 4110 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities. A.three
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities. A.four
4. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
5. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
6. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
7. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
8. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions, family structures, relationships, stressors, and supports (including the impact of having a child with diverse abilities), home language, and ethnicity. C.twelve
9. Adapt content to meet the needs of each child, including the development of individualized family service programs (IFSP) or individualized education programs (IEP) for children with diverse abilities through the team process with families and other team members. D.six 1
10. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two 1
11. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.twelve 1
13. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguards confidentiality and privacy. F.two 1
14. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for individual family service programs (IFSP) and individual service programs (IEP). F.three 1
15. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional standards. It is collaborative and open with the goal of supporting diverse children and families. F.eight 1
16. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
17. Demonstrate ability to work collaboratively as an advocate with families and IFSP and IEP team members to provide developmentally supportive environments. H.three 1
18. Demonstrate content knowledge (e.g., art, music, movement, science,

**ECED 5120. Assessment of Young Children, Birth Eight
3 Credits (3)**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as ECED 4120. May be repeated up to 3 credits.

Prerequisite: ECED 5110 or consent of instructor.

Learning Outcomes

1. UNDERSTAND THE TECHNICAL ASPECTS OF EARLY CHILDHOOD ASSESSMENTS -Define and understand the benefits and concerns of assessment, types of assessment, and best practices for early childhood assessments and their targeted populations.
2. CONDUCT AND UTILIZE ASSESSMENTS- Demonstrate proficiency in using a variety of assessment tools to: screen children; assess current skill levels; determine strengths and weaknesses; supplement assessments when warranted; and incorporate data for instructional plans.
3. COLLABORATE WITH OTHER PROFESSIONALS – Utilize transdisciplinary practices with all vested participants when conducting screenings, evaluations, and making recommendations.
4. COLLABORATE WITH FAMILIES- Demonstrate proficiency in obtaining information from parents about their expectations, needs, and priorities when assessing and making early childhood instructional recommendations.
5. EVALUATE PROGRAMS- Implement best practices in program design, advocate for children's services, and articulate/safeguard student IFSP/IEPs according to each child's developmental needs.

**ECED 5130. Working with Parents of Young Children
3 Credits (3)**

Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a deep understanding of the theory, philosophy and goals of multicultural education
2. Develop a knowledge base of the essential concepts to address language, culture, class, gender, and exceptionalities within the theoretical constructs of multicultural education.
3. Develop a personal and social astuteness to the characteristics of culturally, linguistically, and ethnically distinct students while keeping in mind the uniqueness of their persona within a contextually rich school and community milieu.
4. Explore multicultural education strategies that well enhance one's future pedagogical repertoire.
5. Provide learning opportunities to develop multicultural and cross-cultural perspectives for application into future learning environments.
6. Develop an active sense of commitment to collaborative efforts in order to best meet our goals as committed learners and educators who will teach with and facilitate multicultural curriculum in a variety of pluralistic settings.
7. Develop an array of perspective skills in order to accommodate the dynamics of culture change, pluralism, cultural sensitivity, and cultural democracy that occur within classrooms.
8. Demonstrate growth in the dispositions identified in the "Teacher Candidate Disposition" document.

ECED 5210. Leadership and Advocacy in Early Childhood**3 Credits (3)**

The course explores a multidisciplinary approach to early childhood educational leadership, advocacy and change. The course focuses on leadership in its many forms: in teaching, administration, policy, research, and ethics. In addition, we will examine the theory and practice of change to gain an understanding of what contributes to advocating for policy and community change. Students will gain a deeper understanding of themselves as leaders, and ways to improve early education to promote social justice in programs and systems serving families and young children. May be repeated up to 3 credits.

Learning Outcomes

1. Examine and evaluate a multidisciplinary approach to early childhood educational leadership.
2. Examine leadership in its many forms: in teaching, administration, policy, research, and ethics.
3. Utilize theory and practice of advocacy leadership for policy and community change.
4. Develop a statement of leadership philosophy.

ECED 5220. Play in the Early Childhood Curriculum**3 Credits (3)**

Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of play stages, development, and theories of play in early childhood education into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the different types of play (sociodramatic, constructive, rough tumble, games with rule) and their uses in classrooms to promote learning. (I.B)
3. Demonstrate knowledge of the significance of guiding young children's play to enhance learning in early childhood classrooms. (I.C)
4. Demonstrate knowledge of social influences on play and young children's development of gender identity. Provide and use anti-bias materials and experiences in all areas of the curriculum. (I.D)
5. Provide a variety of play activities that facilitate development of the whole child in all areas, physical/motor, social/emotional, language/cognitive and adaptive/living skills. (I.E)
6. Apply knowledge of cultural and play diversity and the significance of socio-cultural political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society. (I.F)
7. Demonstrate knowledge of the many functions play serves in the cognitive, social, and emotional aspects of development in the formative years.
8. Develop and demonstrate skills in selecting quality play activities for young children. (I.G)
9. Demonstrate knowledge of the developmental sequences of play development, including the influence of culture and home factors. (I.H) 1
10. Demonstrate knowledge of how young children acquire and use technology play to promote learning. (I.I) 1
11. Demonstrate knowledge of how play is used to support standards and assessment in early childhood education. (I.J)

ECED 5230. Curriculum in Early Childhood Education**3 Credits (3)**

Development and implementation of curriculum and materials for teaching young children. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement appropriate ECED curriculum.

ECED 5310. Issues in Early Childhood Education**3 Credits (3)**

Examines current trends and problems through readings of theoretical, empirical, and applied literature. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the foundations of literacy development in early childhood.
2. Analyze sociocultural and critical perspectives in early literacy research, theory, and practice.
3. Apply grounded perspectives on topical issues in literacy development in early childhood.
4. Evaluate the literacies embedded in your own teaching/learning and the ones embedded in the communities in which they work.
5. Create sound theoretical and methodological frameworks in an early literacy project. Identify and use various genres in children's literature.

ECED 5410. Seminar on Child Development, Assessment and Well-being of Young Children**3 Credits (3)**

This course will reintroduce you to the world of young children in a variety of early childhood settings. It focuses on early childhood development, observation of young children and evaluation of classrooms, child well-being, and the many ways in which young children learn. Sessions will bridge theory to practice as we explore your internship experiences and gain deeper understanding of your role as an early care and education professional. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of developmental stages, process, and theories of growth, development, and learning into developmentally appropriate practice.
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with special needs.
4. Provide a variety of activities that facilitate development of the whole child in the following areas: physical/motor, social/emotional, language/cognitive, and adaptive/living skills. (I.E)
5. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. (I.G)
6. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. (I.H)
7. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
8. Demonstrate ability to adhere to early childhood education professional codes of ethical conduct and issues of confidentiality. G.one
9. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two 1
10. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four 1
11. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven 1
12. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially, and emotionally). B.two 1
13. Use appropriate health appraisal and management procedures and make referrals when necessary. B.three 1
14. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five 1
15. Implement health care and educational activities for children and families based on health and nutritional information that is responsive to diverse cultures. B.seven

ECED 5420. Science/Math Curriculum**3 Credits (2+2P)**

Methods and materials for developmentally appropriate practices in teaching science and math for young children. May be repeated up to 3 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - third grade educational settings.

ECED 5510. Advanced Teaching and Learning of Literacy**3 Credits (3)**

This advanced graduate early literacy course reviews the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5520. Literacy Development in Early Childhood**3 Credits (3)**

Advanced theory, research, and practice relating to early childhood reading. May be repeated up to 3 credits.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5810. Student Teaching/Seminar**3 Credits (3)**

Provides student teaching experience in a variety of settings with young children ages birth 8. Restricted to: TEP-ECED majors. Students must be Admitted into student teaching to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

ECED 6110. History and Philosophy of Early Childhood Education**3 Credits (3)**

Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the historical figures in early childhood education that have influenced current practices and discourses.
2. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development.
3. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

ECED 6996. Selected Topics in Early Childhood Education**1-6 Credits (1-6)**

Offered under various subtitles. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

Education Courses

EDUC 1110. Freshman Orientation**1 Credit (1)**

Introduction to the university and to the College of Education. Discussion of planning for individualized education program and field experience. Restricted to Las Cruces campus only. May be repeated up to 1 credit.

Learning Outcomes

1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for teaching, reading, writing, and other academic skills in English and the native language.
2. Demonstrates knowledge of and applies management techniques appropriate to classrooms containing students who have varying levels of proficiency and academic experience in both languages.
3. Community/Family Involvement- The bilingual teacher: (a) Recognizes the importance of parental and community involvement for facilitating the learner's successful integration to his/her school environment. (b) Demonstrates knowledge of the teaching and learning patterns of the students' home environment and incorporates these into the instructional areas of program.
4. Assessment- The bilingual teacher: (a) Assesses oral and written language proficiency in academic areas in both languages utilizing the results for instructional placement, prescription, and evaluation. (b) Evaluates the growth of the learner's native and second language in the context of the curriculum. (c) Continuously assesses and adjusts her or his own language use in the classroom in order to maximize learner comprehension and verbal participation

EDUC 1120. Introduction to Education**2 Credits (2)**

Introduction to the historical, philosophical, sociological foundations of education, current trends, and issues in education; especially as it relates to a multicultural environment. Students will use those foundations to develop effective strategies related to problems, issues and responsibilities in the field of education. Restricted to Las Cruces campus only. May be repeated up to 2 credits.

Learning Outcomes

1. Describe the teaching and learning of various American education settings including early childhood, elementary, middle school, high school, and special education.
2. Describe how teachers use educational theory and the results of research of students' learning.
3. Explain the techniques for establishing a positive and supportive environment in the classroom
4. Identify and describe instructional strategies supported by current research to promote thinking skills of all learners.
5. Recognize the teachers' role and responsibilities in an increasingly diverse, multicultural society.

EDUC 1140. Math for Paraprofessionals**3 Credits (3)**

Applied math skills for paraprofessionals working with children. May be repeated up to 3 credits.

Prerequisite: CCDM 103 N.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1150. Math for Paraprofessionals II**3 Credits (3)**

Applied math skills for paraprofessionals working under the direction of a teacher. May be repeated up to 3 credits.

Prerequisite: EDUC 1140.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1185. Introduction to Secondary Education and Youth**3 Credits (3)**

Introductory course for students considering a career in secondary education. Includes historical, philosophical, and sociological foundations, program organization, critical dispositions, and understanding the context of schools and youth. Practicum required. Restricted to: Secondary Ed majors. Traditional Grading with RR.

Learning Outcomes

1. Articulate the attributes of an education professional entering the field.
2. Differentiate and summarize the major educational philosophies and historical events that have influenced the progression of educational practice.
3. Describe the role of law in education with emphasis on the rights and responsibilities of teachers and learners.
4. Develop a preliminary personal philosophy of teaching and learning.
5. Discuss the characteristics and roles of the teacher, the student, and the school in today's education.
6. Identify effective teaching methods, instructional strategies and learning styles.
7. Evaluate the Lesson Planning Process using various lesson planning templates, formats, and rubrics.
8. Explain classroom management techniques.
9. Identify different types of diversity in the classroom environment. 1
10. Describe how learning differences are manifested in schools. 1
11. Describe how teachers use multiple methods of assessment to engage learners in their own growth, to monitor learner progress 1
12. Describe how teachers use multiple methods of assessment to modify instruction and inform decision making. 1
13. Identify the role of Standards and High Stakes Testing in the life of an educational professional 1
14. Complete 24 hours internship in a classroom, preferably a bilingual classroom. 1
15. Document and reflect on your observations throughout your internship. 1
16. Construct an individualized map to teacher licensure in the State of New Mexico.

EDUC 1995. Field Experience I**1 Credit (1)**

Introduction to public school teaching, school visits, classroom observations and discussion seminar. May be repeated up to 1 credit.

Learning Outcomes

1. Demonstrate an understanding of personal attitudes and motivations for entering the field of education.
2. Identify effective teaching strategies that enhance student learning outcomes.
3. Identify classroom management techniques and learning styles.
4. Develop observational skills and reflective thinking skills.
5. Evaluate instructional methods that enhance upper level thinking skills in children.

EDUC 1996. Special Topics in Education**1 Credit (1)**

Supervised study in a specific area of interest. Each course shall be designated by a qualifying subtitle. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

EDUC 1998. Internship I**3 Credits (3)**

Supervised experience in elementary education settings. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

EDUC 2710. Pre-Teacher Preparation**3 Credits (3)**

Assists students in developing the necessary competencies needed for acceptance to the Teacher Education Program. Course content includes basic skill development, test taking skills, and completion of teacher preparation packet. May be repeated up to 6 credits.

Learning Outcomes

1. Investigate the process and requirements of the Teacher Education Program
2. Read critically about teacher's experiences and write brief reactions
3. Discuss philosophies of education and draft a written personal philosophy of education
4. Discuss the nature of education for students with diverse languages, cultures and abilities
5. Draft personal position statements concerning education for students with disabilities and diverse cultures

EDUC 2998. Internship II**3 Credits (3)**

Supervised experience in junior high settings. May be repeated up to 3 credits.

Prerequisite: must be a co-op student.

Learning Outcomes

1. Varies

EDUC 3110V. Multicultural Issues in Society**3 Credits (3)**

Conceptual manifestations of culture, race, ethnicity, class, gender, exceptionalities, language, and bilingualism within and across society. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3120. Multicultural Education**3 Credits (2+2P)**

The conceptual manifestations of culture, race and ethnicity, class, gender, sexual orientation, exceptionalities, language, bilingualism, and global citizenship within the schooling process. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3210. Sheltered English Instruction for the ESL Classroom**3 Credits (3)**

Addresses the acquisition of English proficiency by speakers of other languages. May be repeated up to 3 credits.

EDUC 3220. Language, Literacy, and Culture in the ESL Classrooms**3 Credits (3)**

Framework and strategies for developing the written abilities of second language learners. May be repeated up to 3 credits.

EDUC 3996. Special Topics in Education**1-3 Credits (1-3)**

Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 cr. per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 3997. Secondary Field Experience**3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Taught with: BLED 3110. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices in secondary education.

**EDUC 4310. Methods of Teaching Elementary School Science
3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia. Students must complete 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department. Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons;
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction;
3. Develop assessment tools to evaluate learner's science knowledge;
4. Identify and use appropriate NMSTEM Ready!State science standards for lesson planning;
5. Integrate science with all subjects;
6. Discuss the advantages and the importance of membership in national/international professional organizations(e.g. NSTA) as well as subscribing to professional journals;
7. Identify science educational resources available using a variety of technological tools to enhance learning;
8. Demonstrate competence and confidence in teaching science;
9. Demonstrate basic classroom management skills.

**EDUC 4320. Methods of Teaching Elementary School Mathematics
3 Credits (3)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades.

Prerequisite: MATH 1134.

Learning Outcomes

1. Identify what makes a 'good mathematical task', and how a good task can support students' learning;
2. Understand how children make sense of key mathematics concepts;
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving;
4. Identify your role as a teacher in a math classroom;
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching;
6. Adjust lessons and instruction based on students' needs;
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching;
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process;
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics

**EDUC 4330. Methods of Teaching Elementary School Social Studies
3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. May be repeated up to 3 credits.

Learning Outcomes

1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

**EDUC 4410. Teaching Science at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Taught with EDUC 5410.

May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

**EDUC 4420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Taught with EDUC 5420.

May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

**EDUC 4430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Taught with EDUC 5430.

May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

EDUC 4440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Taught with EDUC 5440. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

EDUC 4510. Data Literacy and Assessment

3 Credits (3)

Methods for selecting, constructing, and using multiple methods of assessment to monitor learner progress and improve student learning. Students will learn to analyze and use classroom and standardized assessment data to understand patterns and gaps in learning, to guide planning and instruction, and employ technology to support practice. May be repeated up to 6 credits.

Learning Outcomes

1. Understand and implement effective data literacy and assessment procedures.

EDUC 4520. Contemporary Issues in Education

3 Credits (2+2P)

Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. Requires field experience component in a school or community setting. May be repeated up to 3 credits.

Learning Outcomes

1. Understand important issues and practices in contemporary education.

EDUC 4530. Science for Educators

3 Credits (3)

This course will focus on the exploration of key central science concepts and how to connect learners to resources, tools of inquiry, and collaborative problem solving related to authentic local and global issues in classroom, lab, and digital science environments. Topics include: The nature of science, Physical Science, Life Science, Earth and Space Science.

Learning Outcomes

1. Understand primary science content and knowledge for K-12 classrooms.

EDUC 4810. Elementary Student Teaching

9 Credits (9)

Synthesis of knowledge and skills appropriate to teaching in elementary schools. May be repeated up to 9 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

EDUC 4811. Elementary Student Teaching Seminar

3 Credits (3)

Discussion of elementary school issues related to student teaching.

Taken concurrently with EDUC 4810. May be repeated up to 3 credits.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

EDUC 4820. Secondary Student Teaching

9 Credits (9)

Synthesis of knowledge and skills appropriate to teaching in secondary schools. May be repeated up to 9 credits.

Learning Outcomes

1. Carry out effective student teaching in a secondary classroom.

**EDUC 4821. Middle and High School Student Teaching Seminar
3 Credits (3)**

Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 4820. May be repeated up to 3 credits.

Learning Outcomes

1. Carry out effective student teaching in a secondary classroom.

**EDUC 4992. Directed Study Courses in Education
1-3 Credits (1-3)**

Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

**EDUC 4996. Topics
1-3 Credits (1-3)**

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

**EDUC 5110. Exploration in Education
3 Credits (3+3P)**

Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.

Learning Outcomes

1. Explore important concepts and knowledge necessary to carry out effective practices in K-12 classroom settings.

**EDUC 5120. Multicultural Education
3 Credits (2+2P)**

Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Taught with EDUC 3120 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the influence on learning of such social identities as race, class, sexual orientation, language, and gender.
2. Deconstruct tacit knowledges about learners and the learning process.
3. Distinguish among the structural and discursive forces that hamper particular students' educational attainment.
4. Evaluate one's own personal response to oppression in educational settings.
5. Support a pedagogical perspective and school level strategies targeted towards a more just and equitable education in your classroom.

**EDUC 5130. Technology and Pedagogy
3 Credits (3)**

Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities. Students must be in Graduate standing. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the relationship between curriculum and pedagogy.

**EDUC 5140. Research in Curriculum and Pedagogy
3 Credits (3)**

An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research. May be repeated up to 3 credits.

Learning Outcomes

1. Locate metrics useful for evaluating the quality of published research;
2. Identify the claims and supportive evidence presented in published empirical research;
3. Weigh the evidence presented in published empirical research;
4. Analyze the alignment of methods used in published empirical research with associated frameworks and research questions;
5. Synthesize a narrow body of literature in their field of interest.

**EDUC 5150. Classroom Management
3 Credits (3)**

Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations. May be repeated up to 3 credits.

Learning Outcomes

1. Understand effective practices in K-12 classroom management.

**EDUC 5160. Curriculum and Pedagogy
3 Credits (3)**

Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the historical development of standards, curriculum, and assessment in the USA;
2. Critically analyze the major influences on the historical development of standards, curriculum, and assessment;
3. Explain the positive and negative impacts these major influences have had on current standards, curriculum, and assessment;
4. Students will be able to express attainable planned actions to advocate for socially just and equitable systems within their school, district, community, and profession;
5. Construct a coherent pedagogical perspective that draws on the theories and perspectives discussed throughout the course;
6. Create a plan for a lesson that puts into action the curricular and pedagogical perspectives that place value in, and make space for, the diversity of individual social development within and between cultures.

EDUC 5170. Action Research Projects**3 Credits (3)**

Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency. May be repeated up to 3 credits.

Prerequisite: EDUC 5120, EDUC 5140.

Learning Outcomes

1. Understanding of Action Research
2. Develop an Action Research plan: Question Development; Data collection plan; Analysis
3. Analysis to Action for teaching: Applying data results to planning; Decision-making for changes in teaching
4. Presentation of Research: Research writing process

EDUC 5210. Sheltered English Instruction for the ESL Classroom**3 Credits (3)**

Addresses the acquisition of English proficiency via the SIOP (Sheltered Instruction Observational Protocol) a research validated model for lesson planning and implementation that provides English learners with access to grade-level standards.

EDUC 5220. Language, Literacy and Culture in the ESL Classrooms**3 Credits (3)**

Framework and strategies for developing the written abilities of second language learners. Explore different theories of language, culture and literacy by analyzing the interconnections between language, culture and literacy.

EDUC 5310. Methods of Teaching Elementary School Science**3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Students should have 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department to enroll in this course. Taught with EDUC 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810; EDUC 5320; READ 5310.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons;
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction;
3. Develop assessment tools to evaluate learner's science knowledge;
4. Identify and use appropriate NMSTEM Ready!State science standards for lesson planning;
5. Integrate science with all subjects;
6. Discuss the advantages and the importance of membership in national/international professional organizations(e.g. NSTA) as well as subscribing to professional journals;
7. Identify science educational resources available using a variety of technological tools to enhance learning;
8. Demonstrate competence and confidence in teaching science;
9. Demonstrate basic classroom management skills.

EDUC 5320. Methods of Teaching Elementary School Mathematics**3 Credits (2+2P)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Taught with EDUC 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: MATH 1134.

Corequisite: ECED 5810; EDUC 5310; READ 5310.

Learning Outcomes

1. Identify what makes a 'good mathematical task', and how a good task can support students' learning;
2. Understand how children make sense of key mathematics concepts;
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving;
4. Identify your role as a teacher in a math classroom;
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching;
6. Adjust lessons and instruction based on students' needs;
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching;
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process;
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics

EDUC 5330. Methods of Teaching Elementary School Social Studies**3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Taught with EDUC 4330 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: READ 5320.

Learning Outcomes

1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

EDUC 5410. Teaching Science at the Middle and High School Level**3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

**EDUC 5420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as EDUC 4420 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

**EDUC 5430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 4430 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

**EDUC 5440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)**

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 4440 with differentiated assignments for graduate students. TEP required. May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

**EDUC 5510. Elementary Science Development
3 Credits (3)**

Understanding of the research on elementary development of science and its application in the classroom. Focus on how elementary students come to understand topics in the physical sciences, life sciences, and earth and space sciences. Includes applications to engineering and technology. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

**EDUC 5520. Elementary Mathematics Development I
3 Credits (3)**

Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students come to understand counting, the base 10 number system, and connections between early number understanding, geometric representations, fractions, and operations in later grades. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of mathematics into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of mathematics.

EDUC 5530. Elementary Mathematics Development 2**3 Credits (3)**

Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students develop multiplicative reasoning from a foundation of additive reasoning, connections to geometric representations, and how multiplicative reasoning supports development of understanding of fractions, ratios, and rate—which leads to proportional reasoning. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

EDUC 5540. Leadership Advocacy in Elementary Mathematics and Science**3 Credits (3)**

This course focuses on development of elementary mathematics and science specialists' leadership qualities necessary to promote and advocate for positive change through active participation with other professionals and in their own professional growth that draws upon current research in their respective fields, development of professional development programs, evaluation of educational structures that impact equitable access to high quality instruction, and communication with stakeholders directly and indirectly associated with education institutions. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To leverage current research on elementary students' development of mathematics science to enact change in teaching practice and education policy.
2. To make use of leadership skills to facilitate discussion with education stakeholders, school and district administrators, and teaching professionals.
3. To make use of leadership skills to collaborate with education stakeholders, school and district administrators, and teaching professionals.
4. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with current research on best practices.
5. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with district and/or school mission and vision.

EDUC 5810. Student Teaching**6 Credits (6)**

Integrated with EDUC 5811. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary.

Corequisite: EDUC 5811.

Learning Outcomes

1. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
6. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues
7. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
8. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
9. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. 1
10. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

EDUC 5811. Teaching Methods Laboratory**3 Credits (3)**

Practical application of previously learned content. Students must have a Bachelors degree and admission to the Graduate School and departmental special program. May be repeated up to 3 credits.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

EDUC 5990. Master's Thesis**1-6 Credits (1-6)**

Thesis. A minimum of four credits and a maximum of six credits (thesis hours) can be counted toward the MA degree. The thesis hours require the permission of the course instructor. May be repeated up to 15 credits. May be repeated up to 15 credits.

Learning Outcomes

1. Graduate students at the Master of Arts level pursuing a research focus degree learn how to prepare for basic research study.
2. Graduate students at the Master of Arts level pursuing a research focus degree learn how to submit IRB for a research study.
3. Graduate students at the Master of Arts level pursuing a research focus degree learn how to conduct a comprehensive study.
4. Graduate students at the Master of Arts level pursuing a research focus degree learn how to summarize the research and write the results in a thesis.
5. Graduate students at the Master of Arts level pursuing a research focus degree learn how to present results from research and defend the results.

EDUC 5991. Special Research Programs**1-3 Credits (1-3)**

Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in a specific research topic.

EDUC 5992. Directed Study Courses in Education**1-3 Credits (1-3)**

Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in a specific education topic.

EDUC 5996. Special Topics**1-3 Credits (1-3)**

Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 5997. Capstone Research Project**1-3 Credits (1-3)**

Capstone project. Maximum of 3 credits per semester and a total of 6 credits overall. Consent of Instructor required. Restricted to: Admittance into the Master of Arts in Education: Elementary Mathematics and Science program.

Learning Outcomes

1. To investigate a problem or issue in education.
2. To communicate results of the investigation in a scholarly manner.

EDUC 5998. Social Studies/Language Arts Methods Internship
3 Credits (3)

Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 5998. Restricted to CI and HSS non-degree students. May be repeated up to 3 credits.

Learning Outcomes

1. Carry out a successful internship in social studies and language arts teaching methods.

EDUC 6110. Curriculum for a Diverse Society
3 Credits (3)

Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on the significance of the teachers' professional role in schools;
2. Analyze the notion of curriculum in a broader sense along with the concepts of culture and diversity;
3. Develop understanding of the fundamental theoretical constructs in organizing the way we interact and live in our society;
4. Assume the commitment to challenge the taken for granted assumptions that have led schools to be places where inequities have been perpetuated;
5. Take on the challenge of transforming schools into public social spheres where hope is promoted, looked for, and risks are taken and faced.

EDUC 6120. Pedagogy of Learning in a Diverse Society
3 Credits (3)

Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Instill a personal discipline that will establish clarity into your plan of studies to operationalize the direction of your research project;
2. Develop a deeper and thicker knowledge base, language facility, and chronological understanding that impact contemporary theoretical/philosophical paradigms;
3. Create a critical reflection on many of the contemporary issues/findings of recent brain research, its implications for pedagogy and andragogy and central to teaching and learning;
4. Articulate several of the diverse historical forces that legitimate certain teaching and learning practices, theories/issues in contemporary schooling life, and delegitimize other theories/issues just as easily;
5. Create a sense of collegiality and community with your seminar colleagues inside and outside of this course

EDUC 6210. Curricular Mediation for Democratic Communities
3 Credits (3)

Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BLED 6210. May be repeated up to 3 credits.

EDUC 6220. Praxis and Reflexivity
3 Credits (3)

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, READ 6220. May be repeated up to 3 credits.

EDUC 6230. Research as Praxis
3 Credits (3)

Alternative community-or-school-based research aimed at investigating and transforming educational realities, with the participants for their own benefit. Students will experience the dynamic between research theory and practice in education. Restricted to: EDUC,C I,C ID majors. May be repeated up to 3 credits.

Prerequisite: EDUC 6420.

EDUC 6310. Critical Theory and Pedagogy
3 Credits (3)

Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BLED 6310. May be repeated up to 3 credits.

EDUC 6320. Social Justice Issues in Education
3 Credits (3)

Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BLED 6320. May be repeated up to 3 credits.

EDUC 6330. Critical Race Theory & Storytelling in Educational Spaces
3 Credits (3)

An upper-level doctoral course focusing on the philosophical, theoretical, and methodological origins and practices of CRT and the sister frameworks that emerged from CRT, i.e., AsianCrit, BlackCrit, FemCrit, LatCrit, QueerCrit, TribalCrit, and WhiteCrit within educational spaces. May be repeated up to 3 credits.

Learning Outcomes

1. Articulate the major tenets and assumptions of critical race theory (CRT);
2. Evaluate CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses;
3. Synthesize research conducted by CRT scholars and the effect of racial injustice on students of color;
4. Analyze and disrupt majoritarian narratives (stories) that perpetuate racial injustice in the U.S., with a focus on institutions that intersect with educational systems.

EDUC 6410. Current Research in Educational Practice
3 Credits (3)

A seminar for doctoral and education specialist students emphasizing current research and educational practices. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of a specific education research topic.

EDUC 6420. Evaluation of Quantitative Research in Education**3 Credits (3)**

A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6430. Advanced Statistics**3 Credits (3)**

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. A computer package will be the primary tool for data analysis.

Prerequisite: EDUC 6420 or equivalent course work.

Learning Outcomes

1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for research in education.
2. Demonstrates knowledge of and applies research techniques appropriate to a research problem.

EDUC 6440. Qualitative Research I**3 Credits (3)**

This course offers an examination of qualitative research approaches used in educational and social settings, with a focus upon research design, field relations, data collection and analysis, and writing from a qualitative perspective. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6910. Dissertation Seminar**3 Credits (3)**

Dissertation seminar course for doctoral students utilizing a qualitative research design. May be repeated up to 3 credits.

Learning Outcomes

1. To investigate a problem or issue in education.
2. Prepare the first three chapters of a dissertation.

EDUC 6990. Practicum**2-6 Credits (2-6)**

Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction. Students must be in post-master's standing. May be repeated up to 6 credits.

Learning Outcomes

1. Plan course of study with with faculty advisor or instructor.
2. Set practicum expectations for semester.

EDUC 6991. Doctoral Research**1-15 Credits (1-15)**

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in a specific research topic.

EDUC 6996. Selected Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 6 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

EDUC 6997. Independent Study Topics**1-3 Credits (1-3)**

A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.

Learning Outcomes

1. Plan course of study with with faculty advisor or instructor
2. Set course expectations.

EDUC 6998. Internship in Curriculum and Instruction**3-6 Credits (3-6)**

For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. Complete an educational internship.

EDUC 6999. Ed.S. Thesis**1-15 Credits (1-15)**

Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.

Learning Outcomes

1. To investigate a problem or issue in education.
2. Prepare the a complete doctoral project.

EDUC 7000. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Complete all phases of dissertation.
2. Defend dissertation

Educational Learning Technology Courses

EDLT 2110. Integrating Technology with Teaching

3 Credits (3)

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

Prerequisite: ENGL 1110G.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-12 schools and apply that knowledge into future practice.

EDLT 3110. Integrating Technology with Teaching

3 Credits (3)

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-Twelve schools and apply that knowledge into future practice.

EDLT 5110. Foundations of Learning Design & Technology

3 Credits (3)

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments.

May be repeated up to 3 credits.

Learning Outcomes

1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process. Conduct a needs assessment.
3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 5120. Critical Digital Literacy

3 Credits (3)

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. May be repeated up to 3 credits.

Learning Outcomes

1. Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

EDLT 5130. Technology and Language Learning

3 Credits (3)

Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Considers use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments

EDLT 5140. Fostering Online Learning Communities

3 Credits (3)

Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.

Learning Outcomes

1. Examine theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.

**EDLT 5210. Social Media in Blended and Online Learning Environments
3 Credits (3)**

This course will explore the role of social media in online and blended learning environments through practical hands-on activities, critical dialogue, and collaborative projects which will prepare you to utilize social media personally and pedagogically. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and give examples of social media for use in your blended and online learning environments.
2. Actively engage, communicate and collaborate using social media, both inside the classroom and in appropriate social media-based learning environments.
3. Evaluate, analyze, and synthesize readings, research, and other information about social media in education.
4. Access, utilize, design, evaluate, and assess learning activities using social media.

**EDLT 5220. Culturally Responsive Teaching with Technology
3 Credits (3)**

Use of inquiry and problem-based learning supported by computer-based applications. Critical analysis of multiple forms of electronic media. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in culturally responsive teaching with technology.

**EDLT 5230. Designing and Organizing Online Learning Environments
3 Credits (3)**

Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.

Learning Outcomes

1. Design and organize effective online learning.

**EDLT 5240. Online Teaching and Learning
3 Credits (3)**

This course provides a survey of theories, models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an awareness of equity social justice issues related to online education.
2. Critique and reflect upon diverse design frameworks,
3. Develop online resources for use in your professional and personal educational pursuits,
4. Explore and participate in the use of emerging technologies for online education.
5. Identify and discuss the impact of different technological innovations on society with particular emphasis on education,
6. Analyze and evaluate the use of technologies for teaching and learning in culturally relevant and responsive ways.

**EDLT 5250. Tools and Techniques for Online Teaching
3 Credits (3)**

Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience. May be repeated up to 3 credits.

Learning Outcomes

1. Implement effective online teaching.

**EDLT 5310. Design and Delivery of Webconferences and Webinars
3 Credits (3)**

This course provides hands-on experiences with web conferencing and examines the theory and research of webconferencing's impact on teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate the skillful use of the technology tools for a synchronous webconferencing system.
2. Evaluate best practices of interaction and engagement in the design and delivery webconferencing events.
3. Develop a variety of webconferencing strategies to engage and manage webconferencing attendees.
4. Design, develop, and implement the delivery of a web conference, first with a partner or team and individually by the end of the course.
5. Use self- and peer-evaluation for continuous improvement of web conferencing sessions.

**EDLT 5320. Universal Design in Online Course Design
3 Credits (3)**

Examines theory, practical application of strategies, and global and policy implications of universal design (UD) in online learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement universal design.

**EDLT 5330. Emerging Technology Tools and Techniques
3 Credits (3)**

This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Implement effective techniques.

**EDLT 5992. Directed Study
3 Credits (3)**

Supervised academic work. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of an EDLT topic.

EDLT 5999. Capstone**3 Credits (3)**

The capstone course provides an opportunity to demonstrate teaching and learning in blended and fully online environments. Demonstrate competencies with best practices in culturally responsive teaching, learning/educational technology, online pedagogy, portfolio creation, and curriculum development for blended and online delivery using emerging technologies. May be repeated up to 3 credits.

Learning Outcomes

1. Apply teaching and learning standards to review blended or online courses for learning environments.
2. Demonstrate proficiency using the tools of learning management systems.
3. Apply best practices in instructional design for blended/online courses
4. Explain how research and practice inform your course instructional design decisions.
5. Create a blended or online learning course that meets online teaching standards
6. Demonstrate participation in an online learning community.

EDLT 6110. Foundations of Learning Design & Technology**3 Credits (3)**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Includes a theoretical and research component for doctoral students. May be repeated up to 3 credits.

Learning Outcomes

1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process. Conduct a needs assessment.
3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 6120. Emerging Models for Learning Design & Technology**3 Credits (3)**

Integration of technology into content areas. May be repeated up to 3 credits.

Learning Outcomes

1. Understand emerging EDLT models.

EDLT 6210. Current Research in Learning and Technology**3 Credits (3)**

Explores models and methods for examining and researching the impact of technology on learning and education. May be repeated up to 3 credits.

Learning Outcomes

1. Understand current technology research.

EDLT 6220. Multimedia, Authoring and Curriculum Design**3 Credits (3)**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Includes additional theoretical research component for doctoral students. May be repeated up to 3 credits.

Learning Outcomes

1. Facilitate effective technology learning environments.

EDLT 6230. Technology, Society, and Education**3 Credits (3)**

Investigates models of the change process, examines speculations related to the directions and dynamics of change in an era of electronic technologies, explores shifts in the cultural and personal activities and relations of humans, and speculates on concomitant educational implications. May be repeated up to 3 credits.

Learning Outcomes

1. Understand technology and pedagogy.

EDLT 6240. Online Teaching and Learning**3 Credits (3)**

This course provides a survey of theories; models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. Topics covered include accreditation, assessment, culturally responsive course design, current trends and best practices, hybrid and blended learning, learning management systems, online support services, social justice issues in online education, learner engagement, and retention.

Learning Outcomes

1. Implement effective digital pedagogy.

EDLT 6998. Advanced Fieldwork**3 Credits (3)**

Fieldwork in learning technologies provides opportunities to integrate theory and practice through research, teaching and/or development. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the historical figures in early childhood education that have influenced current practices and discourses. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

Educational Leadership Administration Courses

ELAD 2210. Leadership and Change in Education 3 Credits (3)

This course will introduce students to the challenges and key strategies in initiating, implementing, and sustaining educational change and reform. In the first part of the course, participants will learn about the challenges of educational change in the United States and the role that they as school leaders play in facilitating change and reform. The course continues with an examination of how culture, micro-politics, and power structures support or impede national and global change initiatives. The last part of the course offers suggestions for change agents including community organizing, culture building, and embracing sustainable leadership practices. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to communicate in clear manners that articulate, convey and deepen the understandings others have of issues affecting their communities.
2. Students will be able to collaborate on democratic processes.
3. Students will be able to communicate engage in critical social analysis and how the status quo fits into a larger movement for social change.

ELAD 2340. Multicultural Leadership in Education 3 Credits (3)

Introduction to the social and cultural constructions of gender, class, and race. Students will critically apply theoretical constructs to everyday life and discuss the intersection of gender and race with class inequality in national and global contexts. Using a social justice framework, readings, and assignments integrate a variety of racial/ethnic groups while considering the effects of historically uneven resource distribution, unearned privilege, forms of domination and subordination, immigration status, and cultural representation and ideologies. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.

Learning Outcomes

1. Students will develop awareness of their own social identities.
2. Students will recognize differences among various communities, perspectives, and world-views.
3. Students will describe how privilege and biases impact our communities and systems.
4. Students will create meaningful peer-to-peer relationships.
5. Students will understand the impact of their actions on community members.
6. Students will identify their leadership skills to shape social change on and off campus.
7. Students will act on opportunities to promote social change.
8. Students will use academic resources including advising, computers, printing, library, and space.

ELAD 2996. Special Topics in Educational Leadership 1-3 Credits (1-3)

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Students will be able to engage in systems thinking which aids in seeing how individual situations are shaped by a broader contexts
2. Students will be able to understand how to apply theoretical frameworks for understanding social problems.
3. Students will be able to help develop leadership capacity in others.
4. Students will be able to gain an understanding of cultural competence, which recognizes that diverse perspectives strengthen the dialogue and approaches to solving social problems.

ELAD 3110V. Introduction to Educational Leadership in a Global Society 3 Credits (3)

Multinational educational systems covered through knowledge of the U.S. system of education promoting critical leadership roles every citizen plays in the success of educational systems. May be repeated up to 3 credits.

Learning Outcomes

1. Students will share reflections on issues of national and global importance in the field of educational leadership.

ELAD 3210. Current Issues In Educational Leadership 3 Credits (3)

This course addresses issues such as the rise in international education, education's costs, social media's role and influence, changes in state and national funding trends, student and faculty/staff diversity, among others. The focus of this course is centered on the actions and responses of administrators to the current issues they are facing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will identify the overarching issues that leaders in educational institutions are or will be facing;
2. Students will articulate a more multicultural perspective through which to view the possible impact of these current issues on both those within the institution and those who are impacted by these institutions;
3. Students will reconstruct their perspective to allow for a greater awareness of the how these current issues might differentially impact culturally, linguistically, and socio-economically diverse populations;
4. Students will criticize inequitable examples of unfair educational policy and explore ways in which to develop culturally responsive practices when addressing current issues

ELAD 3996. Special Topics in Education 1-3 Credits (1-3)

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 4110. Management of Student Services**3 Credits (3)**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) for early entry level positions. This course will provide students with an examination of foundations and principals of student services. Important theories and essential competencies needed in order to be successful will be explored through a social justice perspective of leadership. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the origins of student services concerning social and historical events programs.
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services
4. Critique inequity issues in student services as they relate to institutions of higher education and how social justice action might improve or eliminate such inequities.
5. Explain the primary legal foundations, ethical standards, and daily operation of student services programs.

ELAD 4120. Principles of Education Law and Policy**3 Credits (3)**

Overview of the use of law and policy in schools and higher education. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the options on policy issues using the statutes, cases, regulations, and legislative history as their tools.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.
4. Compare and contrast how higher education law differs between private and public higher education.

ELAD 4130. Principles of Education Budgeting and Finance**3 Credits (3)**

Analysis of budget and finance practices in education. Restricted to: E AD majors. May be repeated up to 3 credits.

Learning Outcomes

1. Identify opportunities to use research and individual projects to explore issues related to topics of interest to them
2. Describe ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 4410. Foundation for School Library Specialists**3 Credits (3)**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Taught with ELAD 5410. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic competencies for library specialists.

ELAD 4420. Administration of the School Library**3 Credits (3)**

Principles and practices related to the function, structure, and management of school libraries. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic competencies for library administration.

ELAD 4510. Elements of Research**3 Credits (3)**

This course provides students with a foundation for understanding educational research. The course will also provide grounding in proper writing format for use in the education profession. Students will be introduced to various research paradigms and the symbiosis of theory and practice. Besides introducing students to the symbiosis of theory and practice, students will complete assignments and activities that demonstrate the use of that symbiosis. Ultimately, students will be able to use the knowledge they gain through the course to be able to critique educational research. May be repeated up to 3 credits.

Learning Outcomes

1. Define what good research entails
2. Critique journal articles dealing with educational leadership
3. Use proper APA format in writing papers and written discussion
4. Use ethical standards for decision making in research

ELAD 4998. Internship**3 Credits (3)**

The undergraduate Educational Leadership major requires that students complete two internships. Internships provide students with either experience working in an area of administration that is different from the student's regular job or experience conducting research for a program or project. Each internship placement site and scope of work is determined through consultation with the course instructor. Students must complete 120 hours of work with the selected internship site. Student must be an E AD major and be within (at least) one year of graduation. May be repeated up to 6 credits.

Learning Outcomes

1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 5110. The Principalship**3 Credits (3)**

Key issues surrounding the role of school-site leaders. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Students will examine the complexities of school leadership.
2. Students will create a school culture representative of their own core values.
3. Students will assess the role and importance of the principal in facilitating change, managing conflict, promoting an active anti-racist environment, celebrating diversity, and establishing accountability for all students' learning.

**ELAD 5120. Leadership and Administration of Bilingual Education
3 Credits (3)**

Concepts and practical approaches to improving the education of English languages learners through higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Examine the complexity and overarching issues encompassing the role of the school leader as it pertains to the broader and narrower goals of bilingual education
2. Develop critical understandings of educating equitably, involving the development and sustainability of bilingual education programs which focus on making schooling meaningful and comprehensible for the millions of children whose home languages are different from the dominant language of school and society

**ELAD 5130. Basing Decision on Data: Pk-12
3 Credits (3)**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of instructor is required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Identify various types of data and their uses in decision-making
2. Identify federal and state assessment programs, as well as local assessment requirements, and the policies that drive them
3. Explain how data from multiple sources is used to inform decision making about student achievement

**ELAD 5140. Educational Financial Management
3 Credits (3)**

Educational finance and business applications. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand and be able to use and explain to lay people the technical language used to discuss education finance issues.
2. Analyze, interpret, and present financial data, trends, and issues to various publics served by the schools and outline possible actions and their implications

**ELAD 5150. Public School Law
3 Credits (3)**

Legal processes of education, major court decisions, and the legislative process will be studied. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand the critical issues involved in applying the law fairly and justly
2. Understand the complex nature of the federal, state, and local authority levels as they relate to applying statutory and constitutional law

**ELAD 5160. Management of Educational Change: Public Schools
3 Credits (3)**

Leadership in implementing innovations in education. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Students will gain insight into how the structure of schools in the United States impacts the success or failure of educational change and reform.
2. Students will understand the role of implementing or resisting educational change efforts

**ELAD 5170. Special Education Administration
3 Credits (3)**

Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Knowledge of interactive systems and sub-systems and the influence of internal and external environments on the supervisory and improvement processes.
2. Understanding of research and effective professional development practices tied to curriculum, improvement of instructional delivery and student achievement.

**ELAD 5180. Internship Public Schools Part I
3 Credits (3)**

First half of a practical internship in Pk-12 schools under supervision of school administrator. The course must be passed with a grade of "B" or higher. Consent of Instructor required. 3 years of Pk-12 teaching experience required. Restricted to: E AD majors. . May be repeated up to 3 credits.

Prerequisite: 18 cr. of ELAD course work; 3.0 GPA or better.

Learning Outcomes

1. A clear understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education

**ELAD 5185. Internship: Public Schools Part II
3 Credits (3)**

Second half of a practical internship in Pk-12 administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: ELAD 5180; 3.0 GPA or better.

Learning Outcomes

1. A understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment.
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education.

ELAD 5210. Community College Administration**3 Credits (3)**

An overview of the history, role, objectives and patterns governing the effectiveness of the community college. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people;
2. Consider how organization, governance, and finance in higher education vary by institutional type, control, and mission;

ELAD 5215. Higher Education Administration**3 Credits (3)**

This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people
2. Consider how organization, governance, and finance in higher education vary by institutional type, control and mission
3. Gain familiarity with major issues facing U.S. higher education

ELAD 5220. Management of Educational Change: Higher Education**3 Credits (3)**

Leadership in implementing innovations in education in higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Student will gain the insight into how the structure of schools in the United States impacts the success or failure of educational change.
2. Student will understand the role of implementing or resisting educational change efforts

ELAD 5230. Higher Education Finance and Funding**3 Credits (3)**

This course examines the impact and process of financing and funding higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Identify opportunities to use research and individual projects to explore issues related to issues of topics of interest
2. Describe the ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 5240. Management of Student Services in Higher Education**3 Credits (3)**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Explain the origins of student services in relationship to social and historical events
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services programs.

ELAD 5250. Higher Education Law**3 Credits (3)**

This course is designed to review the impact of the legal process and the judiciary on higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Analyze the options on policy issues using the statutes, cases, regulations, and legislative history as their tool.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.

ELAD 5260. Administration of Adult and Continuing Education**3 Credits (3)**

Administration of programs in public schools, higher education, community and nontraditional educational settings. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Analyze adult education theory and the intersection of social justice to inform adult education program planning.
2. Assess the needs of specific populations for adult education programming

ELAD 5270. Basing Decision on Data: Higher Education.**3 Credits (3)**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Participants will understand the importance of using assessment data in decision-making and identify reasons why these skills are important to educational leaders in college and university settings.
2. Participants will evaluate the assessment structure of one institution or department in higher education, using a criteria-based measurement tool (rubric).
3. Participants will reflect on possibilities of using assessment data to further social justice outcomes in higher education.

ELAD 5280. Internship: Higher Education Part I**3 Credits (3)**

First half of practical internship in administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: 15 credits of ELAD coursework and consent of instructor; .

Learning Outcomes

1. Understand the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Will provide a platform for leaders to analytically reflect on the complexity of ethical cases in which the administrator will confront in the scope of administrative role

ELAD 5285. Internship: Higher Education Part II**3 Credits (3)**

Second half of a practical internship in an administrative setting under supervision of an experienced higher education administrator. Internship placement determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: ELAD 5280; 3.0 GPA or better; .

Learning Outcomes

1. Enhance knowledge and practice of higher education administration, keeping in mind that experiences should provide opportunities for thoughtful examination of the diversity of the ways and manners in which office supervisors and staff conduct their work.
2. Provide practical experience and opportunity to examine and apply learned theoretical concepts within a supportive, supervised environment.
3. Develop skills related to higher education management and leadership.

ELAD 5310. Leadership for Social Justice and Equity**3 Credits (3)**

Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Acquired knowledge of multicultural issues as they relate to race, ethnicity, class, and gender and how these factors intersect with current educational leadership trends;
2. Developed a more multicultural perspective which will lead to greater awareness of the needs of culturally, linguistically, and socio-economically diverse students and an ability to develop/enhance an educational leadership lens designed to promote equity and access for all students;

ELAD 5320. Educational Leadership, Supervision, and Evaluation**3 Credits (3)**

Leadership, supervision, and evaluation in Pk-12 and post secondary education. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. To acquire a basic knowledge of the processes, persons, and practices of educational leadership and supervision.
2. To develop personalized understandings of leadership and supervisory roles.
3. To relate leadership and supervision theory to practice.
4. To develop a concept of good administrative/supervisory practice.
5. To develop a diverse awareness of leadership and supervisory issues and techniques.

ELAD 5410. Foundation for School Library Specialists**3 Credits (3)**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELAD 4410. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic competencies for library specialists.

ELAD 5510. Elements of Research**3 Credits (3)**

Survey and analysis of research methods and designs focusing on sound educational research and its presentation. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Explain the purpose of research
2. Analyze the need for research by practicing educational administrators
3. Describe the differences between qualitative research and quantitative research

ELAD 5992. Special Problems.**1-3 Credits (1-3)**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives will vary based on course content.

ELAD 5996. Special Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 5997. Independent Studies**1-3 Credits (1-3)**

Individual investigation in special topic areas. Requires prior approval of project advisor. May be repeated up to 9 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 6110. Organizational Theory**3 Credits (3)**

The overarching objectives of this class is to prepare educational leaders who comprehend the complexities of educational organizations, especially those with significant underrepresented populations; to initiate or maintain leaders' commitment to educational programs that embrace all learners; and to promote within leaders an understanding of the necessity of upholding social justice, primarily as it applies to issues, such as race, ethnicity, class, ability, religion, and gender. Consent of Instructor required. Restricted to: E AD majors.

Learning Outcomes

1. Understand and implement organizational theory.

ELAD 6120. Elements of Research**3 Credits (3)**

Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate self within educational research, Analyze what good research entails
2. Use proper APA (7th ed.) format in writing papers and in written discussions
3. Synthesize scholarly literature, Understand social justice in research and practice
4. Work on small pieces of active research to gain an understanding of what it entails

ELAD 6210. Quantitative Research I**3 Credits (3)**

Explores quantitative research methods, the rationale and assumptions that guide statistical decisions, beginning level statistical analyses, and how all of these are applied in the field of educational leadership. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6220. Qualitative Research I**3 Credits (3)**

Explores qualitative research methods and models and their application in the field of educational leadership. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6310. Concepts of Leadership in Education**3 Credits (3)**

Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement important concepts central to effective educational leadership

ELAD 6320. Foundations of Educational Administration**3 Credits (3)**

Advanced course about the political, economic, and social forces on policy making and governance of PK-12 and postsecondary education. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of the concepts of school leadership, and the political, social and economic contexts that impact schools.

ELAD 6410. Quantitative Research II**3 Credits (3)**

Intermediate quantitative methods of research, statistical analyses, and their application in the field of educational leadership. Restricted to Doctoral students only. May be repeated up to 3 credits.

Prerequisite: ELAD 6210.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6510. Qualitative Research II**3 Credits (3)**

Advanced qualitative methods of research and implementation in the field of educational leadership. May be repeated up to 3 credits.

Prerequisite: ELAD 6220.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6520. Public School Law**3 Credits (3)**

Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. The student will articulate an understanding of basic legal concepts through examination and discussion of relevant court cases.

ELAD 6525. Higher Education Law**3 Credits (3)**

This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Consider CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses.

ELAD 6610. Scholarly Writing and the Southwest Border**3 Credits (3)**

This course is designed to provide doctoral-level students with an opportunity to engage with scholarly and academic writing in a meaningful manner. Scholarly writing and academic writing are often used interchangeably. They will be used in that manner for this course. Generally defined, academic writing refers to a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise. Scholarly writing is the specific genre of writing that is used in all academic fields. For this course, the scholarly writing is contained to the context of the Southwest Border and Borderland issues. This is designed in consideration of and relates to the Department and Program's mission, which takes into account social justice and border education issues. Additionally, the course will cover topics associated with scholarly writing that include, but not limited to: formal language, tone, precision, clarity, word choice, and assumptive statements versus research-supported rationale. Consent of Instructor required. Restricted to: E AD majors.

Learning Outcomes

1. Understand and implement place-based writing through and about the Southwest Border.

ELAD 6620. Evaluation Design in Education**3 Credits (3)**

Advanced course that focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 6630. Educational Financial Management**3 Credits (3)**

This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of the basic concepts of school budgeting and finance practices.

ELAD 6635. Higher Education Finance and Funding**3 Credits (3)**

This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will study the impact of the higher education budget on various departments and services at the university level.

ELAD 6710. The Professoriate**3 Credits (3)**

The purpose of this course is to explore the body of scholarly knowledge and research appropriate for the study of American higher education, the context in which teaching and learning occurs, and faculty's roles in the process. We will discuss the number, variety, and purpose of the various types of institutions; the different roles that faculty members play within these institutions; how faculty work is assessed and valued within the outside of the university; administrative regulations related to faculty work; current issues related to the general state of the professoriate; as well as how does one prepare to enter the professoriate.

ELAD 6910. Dissertation Seminar**3 Credits (3)**

Same as CEPY 6450. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Formulate a research purpose and driving question about a specific topic.

ELAD 6991. Doctoral Research**1-15 Credits (1-15)**

Research. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.

Learning Outcomes

1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

ELAD 6996. Selected Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 6998. Advanced Internship**1-6 Credits (1-6)**

For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 7000. Doctoral Dissertation**1-9 Credits (1-9)**

Dissertation. Minimum of 3 credits per regular semester. May be taken for a maximum of 36 credits. Consent of instructor required. May be repeated up to 36 credits.

Learning Outcomes

1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

Reading Courses

READ 3110. Instruction for Special Reading Needs**3 Credits (3)**

Emphasizes appropriate techniques for teaching reading to learners with special needs. Restricted to: TEP, EED, ECED, SED, and SPED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate basic knowledge of the five domains of reading;
2. Students will demonstrate knowledge of characteristics of reading disabilities (including dyslexia) and the cognitive and linguistic difficulties that may underlie these disabilities;
3. Students will recognize the cultural, environmental and social factors that can impact reading success;
4. Students will explore instructional practices in phonological awareness, phonics, spelling, vocabulary and comprehension that are consistent with current scientific research findings;
5. Students will use or analyze informal and/or criterion-based assessments for determining students' skills in phonological awareness, word identification, and reading fluency and for determining appropriate instructional goals for students;
6. Students will be able to develop a Professional Learning Community by researching and sharing the effectiveness of various strategies/methods/commercial programs for different domains of reading.

READ 3996. Special Topics**1-3 Credits (1-3)**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic.

READ 4310. Elementary School Literacy I**3 Credits (2+2P)**

Reading development, curriculum, and instruction in the elementary grades. Required of all elementary education majors. Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading;
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework;
3. Provide and use anti-bias literacy materials and experiences, including primary language materials;
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer;
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning;
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society;
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 4320. Elementary School Literacy II**3 Credits (2+2P)**

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K 8). Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Prerequisite: READ 4310.

Learning Outcomes

1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process, and the role of literacy in schools and our society;
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so that they reflect an appreciation for child-centeredness and cultural diversity in learning;
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment;
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding;
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 4330. Content Area Literacy**3 Credits (2+2P)**

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Taught with READ 5330. Restricted to: TEP-SED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 5210. Language and Literacy Acquisition**3 Credits (3)**

Framework and strategies of language and literacy acquisition with attention to bilingual learners and the interrelationship among reading, writing, and oral language. May be repeated up to 3 credits.

READ 5220. Sociopsycholinguistics of Reading**3 Credits (3)**

Examines current research on reading process, learning to read, and teaching children to read and evaluates current programs and materials. May be repeated up to 3 credits.

READ 5310. Elementary School Literacy I**3 Credits (2+2P)**

Reading development, curriculum, and instruction in the elementary grades. Same as READ 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810, EDUC 5310, and EDUC 5320.

Learning Outcomes

1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading;
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework;
3. Provide and use anti-bias literacy materials and experiences, including primary language materials;
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer;
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning;
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society;
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 5320. Elementary School Literacy II**3 Credits (2+2P)**

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). Same as READ 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: READ 5310.

Corequisite: EDUC 5330.

Learning Outcomes

1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process, and the role of literacy in schools and our society;
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so that they reflect an appreciation for child-centeredness and cultural diversity in learning;
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment;
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding;
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 5330. Content Area Literacy**3 Credits (3)**

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. "Master' plus Secondary Licensure students Only" and "TEP admission required" May be repeated up to 3 credits.

Prerequisite: SPED 5105, EDUC 5120, EDUC 5110.

Learning Outcomes

1. Define the purpose of schooling begin to articulate the implications for the teacher, youth, teaching, and learning.
2. Explore the historical dimensions of reading instruction in secondary education.
3. Explore the quality and character of life in schools along with the implications for all stakeholders.
4. Explore the roles of reading, writing, listening, and speaking in the content areas.
5. Discuss general pedagogical considerations that extend across all subject matter.
6. Promote the concept that learning in all areas is more authentic and meaningful when knowledge of diverse youth and their communities, content, and pedagogy are valued.
7. Practice strategies that integrate literacy, content, and knowledge of youth.
8. Explore literature in the content area.
9. Develop lesson plans that combine reading, writing, listening, and speaking in the content area that support diversity, integrate technology, and promote effective communication 1
10. Examine the needs of struggling readers. 1
11. Examine the Common Core Standards. 1
12. Engage in research and writing that supports the development of your professional identity as an educator and graduate-level student.

READ 5340. Literacy Assessment and Evaluation**3 Credits (3)**

Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5350. Adult and Family Literacy**3 Credits (3)**

Principles, practices, and instructional materials for adult and family literacy. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and implement various strategies for engaging students and their families through literacy practices in a variety of classroom and home settings.

READ 5360. Digital Literacies**3 Credits (3)**

Digital Literacies study focuses on the multiple relationships between how we express ourselves to one another and the multiple technological systems and networks that provide context, meaning, and shape to those expressions in both social and academic spaces. This course is designed to examine new literacies theory as it applies to teaching applications and current research on digital literacies within K-12 education. As 21st Century practitioner scholars, we are concerned with both the social aspects of literacy practices, understanding that school-based operations are inseparable from the sociocultural contexts in which they are enacted. Must be an NMSU graduate student to participate in this course.

Prerequisite: READ 5340 with a B- or better.

Learning Outcomes

1. Critically assess K-12 implementation of digital literacies across content area curriculum and instruction.
2. Examine seminal and current research on digital literacies' theory, pedagogy, and practice.
3. Determine the level of cultural relevance in schools and pedagogies for 21st Century students.
4. Interpret how social categories relevant to digital literacy contribute to construction of identity.
5. Develop a critical digital pedagogy that addresses the literacy practices of all learners.

READ 5410. Theory and Pedagogy of Literature for Children and Adolescents**3 Credits (3)**

This course provides an in-depth exploration of pedagogy and theory related to literature for adolescents. Students must be in Graduate Standing. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 5420. Theory and Pedagogy of Writing**3 Credits (3)**

This course is designed to examine critical writing theory and pedagogy for K-12 teaching and learning, including inclusive and multicultural approaches, with an emphasis in constructive, collaborative practices, and the integration of digital tools across several genres of writing. Through sequential, thematic units, coursework will emphasize: 1) the study of formative theories along with the development of instructional practices to promote achievement and equity in writing education; 2) the application of these skills through pedagogy and curriculum building, and 3) the construction of broad understandings of craft within the context of the current policies and standards which impact education both regionally and nationally.

Learning Outcomes

1. Critically assess writing curriculum and instruction in K-12 learning environments.
2. Develop a critical writing pedagogy that addresses the literacy practices of all learners.
3. Measure the alignment of writing structures in schools with students' cultural literacies.
4. Interpret how social categories relevant to education contribute to construction of identity.
5. Formulate engaging strategies that develop writers who are competent in multiple genres.

READ 5990. Practicum in Literacy Education**1-6 Credits (1-6)**

Supervised laboratory experience with children with reading difficulties. The student implements a program of specific procedures to aid the disabled reader. May be repeated up to 6 credits.

Prerequisite: READ 5340.

Learning Outcomes

1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5992. Special Studies in Literacy**1-6 Credits (1-6)**

Each study will be designated by a qualifying subtitle. Taught with READ 6992. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in a specific literacy topic.

READ 5996. Selected Topics in Literacy**1-6 Credits (1-6)**

Offered under different subtitles in the Schedule of Classes. Taught with READ 6996 with differentiated subjects for doctoral students. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic.

READ 6110. Critical Issues in Literacy Education**3 Credits (3)**

Critical issues from historical to current perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the multiple critical issues central to literacy education from both a historical and contemporary perspective.

READ 6120. Multiple Critical Literacies**3 Credits (3)**

An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels. Same as BLED 6120. May be repeated up to 3 credits.

READ 6130. Multiculturalism, Literature, and Inquiry**3 Credits (3)**

Advanced exploration and examination of critical multicultural language education vis-a-vis children's adolescent, young adult, and adult literature, with an eye toward problematizing assumptions about literacy, articulating issues of social justice and enacting transactive, transformative pedagogy. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the theories and approaches necessary for conducting inquiry reading and writing.

READ 6210. Ethnography of Reading and Writing**3 Credits (3)**

Covers the dynamics of data interpretation and critical analysis in the study of literacy. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the theories and approaches necessary for conducting ethnographic studies in reading and writing.

READ 6320. Praxis and Reflexivity**3 Credits (3)**

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, EDUC 6220. May be repeated up to 3 credits.

READ 6991. Doctoral Research in Literacy**1-15 Credits (1-15)**

Research on topic of interest. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6992. Special Studies in Literacy**1-6 Credits (1-6)**

Offered under different subtitles in the Schedule of Classes. Taught with READ 5992 with differentiated assignments for doctoral students. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6996. Selected Topics in Literacy**1-6 Credits (1-6)**

Offered under various subtitles that indicate the subject matter. Same as READ 5996. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6997. Independent Study Topics in Reading**1-6 Credits (1-6)**

A problem and seminar course for those pursuing an advanced degree. Each course will have an appropriate subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6999. Research Project**1-15 Credits (1-15)**

Offered primarily for those pursuing the research requirement for the Ed.S. degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

Special Education Courses

SPED 2996. Topics**3 Credits (3)**

Offered under various subtitles that indicate the subject matter to be covered. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 3105. Introduction to Special Education in a Diverse Society**3 Credits (3)**

Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 3110. Bilingual/Multicultural Special Education**3 Credits (3)**

Introduction to issues related to the provision of services to culturally and linguistically diverse students with exceptionalities.

Learning Outcomes

1. Students will identify implicit and explicit biases.
2. Students will discuss the cultural characteristics of families from culturally and linguistically diverse backgrounds and the barriers of parent engagement in their child's education.
3. Students will identify how privilege, power, and inequities exist in the school system and how it impacts the academic achievement of students from culturally linguistically diverse (CLD) backgrounds.
4. Students will identify culturally relevant strategies to employ in the classroom to meet the individual learner needs of students from culturally and linguistically diverse backgrounds.
5. Students will develop a lesson plan that embeds culturally responsive pedagogy that addresses the individual needs of students from culturally and linguistically diverse backgrounds.

SPED 3120. Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society**3 Credits (3)**

Curriculum theory and development for special education programs. Various teaching methods utilized with elementary exceptional learners and techniques involved in identifying, adapting, and developing materials will be addressed. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 4110. Low Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 4120. High Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 4130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6
3 Credits (3)

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 5130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 4140. Reading for Elementary Exceptional Learners in a Diverse Society, 7-12
3 Credits (3)

Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 4150. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society**3 Credits (3)**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 5150. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.)
2. Apply effective methods for planning and implementing culturally responsive secondary differentiated content area instruction for exceptional learners in inclusive settings.
3. Identify demands of learning environments of secondary exceptional learners.
4. Identify basic classroom management theories and strategies for individuals with diverse learning needs in secondary environments.
5. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.

SPED 4210. Introduction to Assessment of Diverse Exceptional Learners
3 Credits (3)

Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs. May be repeated up to 3 credits.

Learning Outcomes

1. Compare and contrast the different types of assessment and their purposes.
2. Identify legislation and litigation, which has impacted assessment.
3. Explain the applications and uses of assessments results.
4. Identify widely used (common) measures of psycho-educational assessment and their appropriate application.
5. Identify a variety of techniques for obtaining information regarding students' academic functioning and learning techniques.
6. Identify techniques for assessing students' socio-emotional functioning.
7. Outline the process for identifying exceptional learners and subsequent educational planning utilizing learning theories.
8. Analyze and identify assessment strategies for specific populations (Culturally and Linguistically Diverse, Preschool, Elementary School, etc.)
9. Integrate information gathered through comprehensive assessment procedures into a whole picture of the student's areas of strength, weakness and needs.

SPED 4220. Classroom Management for Diverse Learners**3 Credits (3)**

Behavior-change strategies for exceptional learners. May be repeated up to 3 credits.

Learning Outcomes

1. Plan the organization of a classroom illustrating optimum use of instructional resources (computers, books, writing materials, reference material, manipulatives, creative constructive materials, etc.) that facilitates efficiency and effectiveness of access, use, maintenance, and storage of such resources.
2. Manage student progress data electronically for visual representation of performance for individual students and whole class averages.
3. Design the organization of the physical aspects of a classroom (furniture, areas, etc) for ease of transition, use, safety and traffic flow based on effective designs presented in the literature.
4. Establish classroom procedures and expectation (rules) to promote a positive, effective and efficient learning environment.
5. Construct the organization of a classroom schedule/time management plan that includes various content areas, instructional strategies, grouping strategies, levels of energy use, etc. Within large blocks of time or for an entire day school day.
6. Demonstrate knowledge and skill of affective domain-based theoretical models for (1) setting and managing the emotional tone of a classroom, (2) managing the psycho-social atmosphere of the classroom and individual students, and (3) managing motivation of students to succeed in learning academic content, social skills, self-responsibility skills, and inter-relationship skills with other class members.
7. Analyze a given classroom situation for legal, ethical and professional issues and concerns, by applying legal, ethical, and professional reactions to the situation and provide resolutions to align the classroom legally, ethically, and professionally. This will include all legal bases (state and federal) involving all students, including students with disabilities, ESL and at-risk students.
8. Observe, analyze and document student behavior to match an appropriate intervention strategy to change behavior in a desired direction. This will also include the successful implementation of behavior management strategies for entire classes, small groups, and individual students along with development and maintenance of electronic data collection graphing and analysis.

SPED 4310. Introduction to Autism**3 Credits (3)**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 5310 and SPED 6310. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 4320. Behavior and Autism**3 Credits (3)**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 532 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 4330. Social Skills and Autism**3 Credits (3)**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 5330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 4340. Communication and Autism**3 Credits (3)**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 5340 and SPED 640 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 4810. Early Childhood SPED Student Teaching**9 Credits (9P)**

Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings. Restricted to: TEP-ECED majors. Grading (S/U, Audit). Students must be Admitted into student teaching May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 4811. Practicum in Education, Equity and Cultural Diversity**3 Credits (3)**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. Restricted to: SPED majors.

Prerequisite: SPED 3105 and SPED 3120 or consent of instructor.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

SPED 4820. Student Teaching SPED**9 Credits (9)**

Supervised teaching in a special education classroom and participation in a required seminar. Students must be admitted to student teaching program in order to enroll. Restricted to: SPED majors.

Prerequisite: SPED 4811.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

**SPED 4830. Special Education/Elementary Student Teaching Seminar
3 Credits (3)**

Discussion of elementary Special Education school issues related to student teaching.

Prerequisite: SPED 4811.

Corequisite: SPED 4820.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**SPED 4840. Special Education/ Secondary Student Teaching Seminar
3 Credits (3)**

Discussion of secondary school issues related to student teaching.

Prerequisite: SPED 4821.

Corequisite: SPED 4820.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**SPED 4992. Directed Study courses in Special Education
1-3 Credits (1-3)**

Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 4996. Topics**3 Credits (3)**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 5105. Introduction to Special Education in a Diverse Society**3 Credits (3)**

This course introduces the field of special education to regular educators.

May be repeated up to 3 credits.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 5110. Low Incidence Disabilities in a Diverse Society**3 Credits (3)**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 6110 with differentiated assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 5120. High Incidence Disabilities in a Diverse Society**3 Credits (3)**

Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 5130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6**3 Credits (3)**

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 4130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 5140. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12**3 Credits (3)**

Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 4140. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 5150. Curriculum, Methods, and Materials for Secondary Special Education**3 Credits (3)**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. May be repeated up to 3 credits.

SPED 5160. Technology and Exceptionality in a Diverse Society**3 Credits (3)**

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate familiarity in variety of assistive technology devices and services that are available for students with diverse range of disabilities
2. Demonstrate an understanding of functional approaches to the assessment of assistive technology needs.
3. Describe and implement inter disciplinary approaches to the assessment, selection and the use of technology to meet the educational and transitional demands of individuals with diverse range of disabilities.
4. Identify and describe the function of the range of assistive technology devices and services in diverse settings.
5. Demonstrate an understanding of the legal obligations of different entities in providing training and services that are relevant to assistive technologies.

SPED 5210. Introduction to Assessment of Diverse Exceptional Learners**3 Credits (3)**

Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students. Restricted to: SPED majors.

SPED 5220. Classroom Management for Diverse Learners**3 Credits (3)**

Behavior-change strategies for exceptional learners. Taught with SPED 4220 with differentiated assignments for graduate students. May be repeated up to 3 credits.

SPED 5230. Advanced Curriculum for Diverse Exceptional Learners**3 Credits (3)**

Strategies for developing curricula appropriate to handicapped and gifted learners. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 5310. Introduction to Autism**3 Credits (3)**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 4310 and SPED 6310. Differentiated Assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 5320. Behavior and Autism**3 Credits (3)**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 4320 and SPED 6320 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 5330. Social Skills and Autism**3 Credits (3)**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Understand and explore the foundations of TESOL instruction.
2. Analyze the sociocultural theory of teaching English as a second/ foreign language.
3. Demonstrate an understanding of culturally responsive pedagogy in language teaching and academic achievement.
4. Evaluate principles of best practices instruction and applications of TESOL methods.
5. Explore assessment issues and concepts related to English Language Learners.
6. Examine the impact of policies, national laws, school and community partnerships, and personal professional development on TESOL instruction.
7. Develop, select, and implement second language teaching methods.

SPED 5340. Communication and Autism**3 Credits (3)**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 6340 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 5405. Foundations of Visual Impairment**3 Credits (3)**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. May be repeated up to 3 credits.

Learning Outcomes

1. Differentiate between the impact that visual impairment (both congenital and adventitious) has on a child's/youth's cognitive, language, communication, motor, social-emotional, and autonomous development.
2. Predict the impact that familial, societal, cultural, and professional attitudes have on the self-esteem/self-identity of a child/youth who has a visual impairment and propose culturally responsive strategies to combat low self-esteem/lack of self-acceptance.
3. Identify appropriate educational adaptations, including universal design for learning principles, for teaching students with visual impairments based on predominant sensory channel(s).
4. Describe the prevalence and incidence of visual impairment, educational and legal classifications, service delivery options and regulations, and the roles of educational staff.
5. Analyze how historical foundations shape current issues and trends in the education of students who are visually impaired.
6. Locate sources of specialized materials, service networks, consumer/parent organizations, and professional associations and publications.

SPED 5410. Functional Implications of Low Vision**3 Credits (3)**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5405.

Learning Outcomes

1. Use basic terminology to describe the structure and functions of the visual system and describe how the visual system typically develops.
2. Identify the etiology and characteristics of the most common eye conditions and their impact on the development and education of individuals who have these conditions.
3. Describe effects of medications on the visual system and on visual performance. Select, adapt, and use appropriate instruments for assessing functional vision. Follow legal, ethical, and technical procedures while conducting vision screenings or functional vision evaluations in order to determine educational services (including eligibility) and supports.
4. Interpret the results of vision screenings, eye reports, and functional vision evaluations in ways that help students, families and other members of the educational team understand the impact the visual impairment has on learning, experience, and social-emotional well-being.
5. Select individualized strategies for the enhancement of visual/sensory efficiency (including the use of environmental modifications, print material adaptations, optical aids, and non-optical aids) based on performance/assessment data

SPED 5420. Strategies for Teaching Students with Visual and Multiple Impairments

3 Credits (3)

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5410.

Learning Outcomes

1. Describe the impact that a concomitant visual impairment and additional disability has on a child's/youth's cognitive, language, communication, motor, social-emotional, autonomous, and sensory development.
2. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the core curriculum (especially literacy) that are based on their unique needs, which transcend the effects of each individual disability.
3. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the expanded core curriculum that are based on their unique needs, which transcend the effects of each individual disability.
4. Choose specialized assessment tools appropriate for learners with visual impairments and additional disabilities.
5. Summarize special considerations related to eligibility determination, educational placement, and service delivery models for students with visual impairments and additional disabilities.
6. Describe special considerations related to effective collaboration with educators, related service providers, educational assistants, community agencies, and families of students with visual impairments and additional disabilities

SPED 5430. Braille I: Literacy for Students with Visual Impairments

3 Credits (3)

This course facilitates an in depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5450.

Learning Outcomes

1. Transcribe print content into Unified English Braille following appropriate formatting rules.
2. Read, interline, and proof materials transcribed in Unified English Braille.
3. Read, interline, and proof materials produced in English Braille American Edition.
4. Transcribe, print content into a foreign language using the appropriate braille code.
5. Read, interline, and proof materials produced in foreign language braille.
6. Transcribe a simple score in music braille.
7. Read and interline a simple score in music braille.
8. Produce braille materials using various tools, including a Perkins Brailler, slate and stylus, and six-key keyboard entry.
9. Delineate the ways that congenital and adventitious visual impairments impact literacy and the unique instructional strategies used with each of these groups. 1
10. Identify pre-braille activities that develop essential tactual, motor, and reading readiness skills. 1
11. Compare language arts and braille curricula/assessments for different types of tactual learners. 1
12. Identify sources for obtaining braille resources, services and supports

**SPED 5440. Braille II: Numeracy for Students with Visual Impairments
3 Credits (3)**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5430.

Learning Outcomes

1. Transcribe mathematical and scientific notation into Nemeth Braille following appropriate rules.
2. Read, and proof materials transcribed in Nemeth Braille
3. Transcribe, print content into a foreign language using the appropriate braille code.
4. Read, interline, and proof materials produced in foreign language braille.
5. Transcribe a simple score in music braille.
6. Read and interline a simple score in music braille.
7. Produce braille materials, including tactile graphics, using various tools, including a Perkins Brailler, six-key keyboard entry, braille translation software, and tactile graphics.
8. Create different task analysis on computational steps for solving problems with the Cranmer abacus using both the counting and indirect methods for beginning abacus users and aligning them to numeracy standards.
9. Delineate the ways that visual impairment impacts literacy and numeracy and describe adapted instructional and assessment materials and resources that make math meaningfully accessible. 1
10. Delineate the ways that visual impairment impacts scientific understandings and describe adapted instructional and assessment materials and resources that make science and social studies meaningfully accessible. 1
11. Delineate the ways that visual impairment impacts understanding of health and sexuality and describe adapted instructional and assessment materials and resources that make health and sex education meaningfully accessible

**SPED 5450. Strategies for Teaching Students with Visual Impairments
3 Credits (3)**

This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptations, IFSP/IEP/ITP planning, and evidence-based practices. Restricted to: SPED majors. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5410.

Learning Outcomes

1. The learner will analyze core curriculum standards and benchmarks in order to determine necessary instruction in the expanded core curriculum so that learners with visual impairments can meaningfully participate in the common core curriculum.
2. The learner will describe professional roles and ethical responsibilities of the teacher of students with visual impairments in relation to effective collaboration with all members of the educational team (particularly families, para educators, and general educators).
3. The learner will select, adapt, and use appropriate assessments for determining effective and efficient primary and secondary learning modalities, literacy media, and access technologies needed for reading and writing.
4. The learner will follow legal, ethical, and technical procedures while conducting learning media assessments and access technology evaluations, reporting findings, and making recommendations regarding necessary educational services and supports.
5. The learner will demonstrate the procurement and use of different access technologies needed to make educational materials and learning activities accessible to learners with visual impairments

SPED 5460. Introduction to Orientation and Mobility**3 Credits (3)**

This course provides an overview of the history and theory of formalized orientation and mobility instruction as it relates to the ability to live independently. The impact of visual impairment and concomitant impairments on the development of spatial concepts and motor skills in relation to independent locomotion is emphasized. Topics covered include mobility aids; navigation, familiarization, and protective techniques; structured pre-cane assessment and instruction; the development and use of tactual maps; and the relationship of orientation and mobility to other areas of the expanded core curriculum. Consent of Instructor required. Restricted to: SPED, EDUC majors. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5420.

Learning Outcomes

1. Describe components of orientation and mobility, the role of the certified orientation and mobility specialist, and the role of the teacher of students with visual impairments/developmental vision specialist in teaching travel skills to students who are blind and visually impaired, including those with additional disabilities.
2. Describe significant historical events and legal provisions related to the formalized profession of orientation and mobility and how this affects the provision of orientation and mobility services.
3. Identify the pros, cons, and prerequisite skills related to different modes of mobility and use of different mobility aids and transportation systems.
4. Describe the impact of impaired vision on cognitive, motor, language, social, and self-help skills and effective interventions that promotes the development of independent locomotion and personal autonomy.
5. Execute (and teach the execution of) basic orientation and mobility techniques under conditions that simulate various degrees of visual and additional impairments using all available sensory information (with and without optical aids) in a variety of environments.
6. Task analyze and adapt activities of daily living to allow individuals with visual impairments to lead productive and healthy lifestyles.
7. Identify sources of adapted products and specialized assessments related to the Expanded Core Curriculum that facilitate participation in home, work, and community activities for employment, self-care, and leisure

SPED 5470. Beginning Orientation and Mobility**3 Credits (3)**

This course provides an overview of the profession of orientation and mobility and how sensory, motor, and psychosocial function affects movement and spatial orientation. Consent of Instructor required.

Restricted to: SPED majors. May be repeated up to 3 credits.

Prerequisite: SPED 5460.

Learning Outcomes

1. Describe how perception and movement develops and is used to enhance safe and independent travel
2. Describe how a traveler is able to acquire, maintain and improve orientation
3. Describe the most common functional mobility problems for students with low vision and what a COMS should consider when providing OM instruction to students with low vision.
4. Describe how development impacts movement and describe issues that impact gait and posture. Describe ways to support and improve sensorimotor development.
5. Describe the psychosocial factors that impact behavior as one learns how to travel and describe ways to teach travelers to deal with
6. Describe the fundamentals of hearing including principles of sound, audition, localization and traffic sounds. Describe ways to develop and improve orientation using hearing
7. Describe the origins of the OM profession and its progression into the present, how OM services are provided around the world and the fundamentals of research in the profession.
8. Evaluate and synthesize literature (publications, research literature) on a selected topic of their choice

SPED 5480. Intermediate Orientation and Mobility**3 Credits (3)**

This course focuses on strategies and methods for conducting assessments and appropriately sequencing skill acquisition for learners across the lifespan who may or may not have additional disabilities. Adaptive technology and other aids that assist with travel in a variety of environmental conditions using different mobility systems will also be covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.

Prerequisite: SPED 5470.

Learning Outcomes

1. Determine how to modify orientation and mobility instruction, depending on the age of the students, in the following ways: A) describe ways to teach OM to very young children; B) describe ways to teach OM to school age children; C) describe ways to teach OM to adults; and D) describe ways to teach OM to older adults.
2. Demonstrate an understanding of mobility systems and adaptations used by blind and visually impaired travelers in the following ways: A) describe how adaptive technology is used in travel; B) describe how dog guides are used in travel; C) describe orientation aids that can be used for students with vision loss; D) describe issues around environmental accessibility for student with vision loss; and E) describe how to teach OM in adverse weather conditions
3. Demonstrate understanding of how to teach OM to students who have different disabilities in the following ways: A) describe ways to teach OM to learners with vision and hearing loss; B) describe ways to teach OM to learners with vision, physical and health impairments; C) describe ways to teach OM to learners with cognitive impairments and vision loss; D) describe ways to teach OM to learners with cortical visual impairments; and E) describe how to teach travel skills to learners with nonvisual disabilities
4. Conduct an OM assessment and teach OM in the following ways: A) describe the components of a comprehensive OM assessment; B) describe creative ways to provide OM instruction; C) describe theories and best practices for teaching orientation and mobility; and D) describe ways to teach concepts creatively

SPED 5490. Advanced Orientation and Mobility**3 Credits (3)**

This course focuses on the development and monitoring of cane skills needed for safe and efficient travel in indoor, residential, and business districts, including the use of public transportation systems. Development, administration, and supervision of orientation and mobility services is also covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.

Prerequisite: SPED 5480.

Learning Outcomes

1. Use orientation and mobility techniques to travel independently, safely and efficiently in a variety of environments including indoor, residential, small business and business areas while blindfolded or under low vision simulator.
2. Provide appropriate and safe orientation and mobility instruction to fellow students, who are blindfolded or wearing low vision simulators, while traveling in indoor, residential, small business and business areas
3. Describe modifications to traditional OM techniques for diverse learners of various ages with different degrees of visual functioning and with a variety of additional disabilities
4. Use public transportation while blindfolded or under low vision simulator and provide instruction to fellow students who are blindfolded or wearing low vision simulators in the use of public transportation
5. Critically analyze one's teaching and monitoring through self-observation and reflective practices

SPED 5810. Student Teaching SPED**6 Credits (6)**

Culminating course required for graduate level students seeking initial licensure. Students must have completed a Bachelor's degree and be admitted to student teaching program to enroll. Restricted to: SPED majors.

Prerequisite: SPED 5811.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5811. Field Experience in Education, Equity & Cultural Diversity 3 Credits (3)

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. This experience is designed for both the practicing general education classroom teacher pursuing special education licensure and for graduate teacher candidates pursuing initial special education licensure. Restricted to: SPED majors.

Prerequisite: SPED 3105 and SPED 3120, or SPED 5105 and SPED 5230, or consent of instructor.

Learning Outcomes

1. Learners will demonstrate critical thinking skills and critical reflection and use current special education research to make and evaluate instructional decisions across the full range of learning tasks (including identifying appropriate learning objectives, selecting methods and materials, assessing student progress in relation to learning objectives, making classroom management decisions, and evaluating the results of decisions and implementation of lessons).
2. Learners will create access to grade level general education curriculum for a broad range of students with diverse learning needs. This will be accomplished by using grade level standards and extended standards (as appropriate), following the requirements expressed in IEP's, and designing and implementing appropriate instruction that addresses students' needs, learning styles, motivation, and cultural and linguistic differences. Universal design, differentiation, accommodation, and modification will be used to address diverse learning needs.
3. Learners will further develop, refine, and demonstrate the dispositions necessary to enter student teaching, with the ultimate goal of entering and advancing the teaching profession. This includes a) building rapport, positive communication, and a cooperative work environment with students, families, teachers, supervisors, instructors, educational/instructional assistants, service providers, and others in the school community b) demonstrating respectful and responsive attitudes toward individuals with exceptionalities from diverse backgrounds, as well as their families and service providers c) demonstrating responsible task performance d) adhering to the CEC code of ethics and university/site policies and procedures.
4. Learners will select and use appropriate technology to support student learning.
5. Learners will apply knowledge of the historical background and current laws and procedures within the field of special education to contextualize, explain, and evaluate special education services.

SPED 5820. Masters Degree Seminar

3 Credits (3)

Capstone review of current issues in special education. Each student will participate in a practice comprehensive oral exam. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

SPED 5830. Special Education/Elementary Student Teaching Seminar 3 Credits (3)

Discussion of elementary Special Education school issues related to student teaching.

Prerequisite: SPED 5811.

Corequisite: SPED 5810.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5840. Special Education/Secondary Student Teaching Seminar 3 Credits (3)

Discussion of secondary Special Education school issues related to student teaching.

Prerequisite: SPED 5811.

Corequisite: SPED 5810.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5850. Current Research in Special Education

3 Credits (3)

Current investigations and research techniques. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

SPED 5860. Current Issues in Special Education for Teaching in Culturally Responsive Society**3 Credits (3)**

Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 6860. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn several concepts, issues, and theories in contemporary special education in order to be a more intelligent consumer of information about special education.
2. Students will analyze, evaluate, and make decisions concerning complex contemporary issues in special education.
3. Students will demonstrate communications skills, both written and oral, in order to enhance their effectiveness in expressing their view on the issues related to special education.
4. Students will examine issues related to the human experience as it relates to diversity and a culturally and linguistically diverse world.
5. Students will debate the pros and cons of current special education issues

SPED 5870. Early Childhood SPED Student Teaching**6 Credits (6)**

A student teaching experience designed for students studying early childhood special education. Restricted to TEP-ECED majors. Students must be admitted to student teaching to enroll. May be repeated up to 9 credits.

Learning Outcomes

1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

SPED 5990. Practicum in Reading Disabilities**3 Credits (3)**

Supervised experience in assessing a student with reading disability, developing and intervention plan, and implementing and monitoring the interventions across time. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

SPED 5991. Special Research Problems**1-3 Credits (1-3)**

Individual investigation either analytical or experimental. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPED 5996. Topics in Special Education**1-3 Credits (1-3)**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPED 5999. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

SPED 6110. Low Incidence Disabilities**3 Credits (3)**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 5110 with differentiated assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 6120. High Incidence Disabilities in a Diverse Society**3 Credits (3)**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 5120. Master's Degree. Restricted to SPED and C D majors. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 6160. Technology and Exceptionality in a Diverse Society
3 Credits (3)

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 5160.

Learning Outcomes

1. Carry out effective practicum practices for using technology with diverse learners.

SPED 6170. School Intervention and Organization in a Diverse Society
3 Credits (3)

Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective interventions in a variety of classroom and organizational settings.

SPED 6310. Introduction to Autism**3 Credits (3)**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Differentiated Assignments. Taught with SPED 5310 and SPED 4310. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 6330. Social Skills and Autism**3 Credits (3)**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 5330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD.
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 6340. Communication and Autism**3 Credits (3)**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 5340 and differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 6810. Doctoral Seminar

1-4 Credits (1-4)

The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. May be repeated up to 4 credits.

Learning Outcomes

- 1. Varies

SPED 6830. Current Research in Special Education

3 Credits (3)

Required for students seeking the Ed.D./Ph.D. M.A. degree. Restricted to majors. May be repeated up to 3 credits.

Learning Outcomes

- 1. Evaluate current research in special Education.
- 2. Read and evaluate original research articles published in peer reviewed academic journals.
- 3. Describe the elements of research.
- 4. Analyze the designs, methods, and applications of quantitative research in special education
- 5. Analyze the designs, methods, and applications of qualitative research in special education
- 6. Examine ethical issues and guidelines for conducting special education research.
- 7. Evaluate the elements of a research proposal.

SPED 6840. Current Issues in Special Education for Teaching in a Culturally Responsive Society

3 Credits (3)

Required for students seeking the Ed.D./Ph.D. May be repeated up to 3 credits.

SPED 6991. Doctoral Research

1-15 Credits (1-15)

Research. May be repeated up to 88 credits.

Learning Outcomes

- 1. Varies

SPED 6996. Selected Topics in Special Education

1-6 Credits (1-6)

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.

Learning Outcomes

- 1. Varies

SPED 6997. Independent Study Topics in Special Education

1-6 Credits (1-6)

A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle. May be repeated up to 99 credits.

Learning Outcomes

- 1. Varies

SPED 6998. Internship in Special Education

1-6 Credits (1-6)

Each course bears a qualifying subtitle. Maximum of 6 credits per semester. May be repeated up to 99 credits.

SPED 7000. Dissertation

1-9 Credits (1-9)

Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated up to 24 credits.

Learning Outcomes

- 1. Varies

Name: School of Teacher Preparation, Administration and Leadership (TPAL)

Office Location: O'Donnell Hall, Suite 302

Mailing Address: P.O. Box 30001, MSC 3TPAL, Las Cruces, NM 88003

Physical Mailing Address: 1220 Stewart Street; O'Donnell Hall Rm 302, Las Cruces, NM 88003

Phone: (575) 646-3825 / 646-4820

Email: schooloftpal@nmsu.edu

Website: <http://tpal.nmsu.edu> (<https://tpal.nmsu.edu/>)

Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies

There is an identified need for prepared educators to serve young children birth to four years of age in settings outside of the public school in childcare centers, Head Start, and other agencies. The School of Teacher Preparation, Administration, and Leadership offers a non-licensure concentration, with the Bachelor of Applied Studies degree for the Zero to Four years old early childhood track. This non-licensure concentration serves private and public childcare, early intervention programs, and Head Start.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. All ECED courses must be successfully completed with a grade of C- or better. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2221G	Writing in the Humanities and Social Science	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1130G	Public Speaking	
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 2134G	Fundamentals of Elementary Math II	3

Area III/IV: Laboratory Sciences and Social Behavioral Sciences

CEPY 1120G Human Growth and Behavior 3

Choose two for a total of 8 credits (must be from two different areas) ¹ 8

ASTR 1120G The Planets Lecture & Laboratory

BIOL 1120G Human Biology
& BIOL 1120L and Human Biology Laboratory

BIOL 1190G Contemporary Problems in Biology

BIOL 2610G Principles of Biology: Biodiversity, Ecology, and
& BIOL 2610L Evolution and Principles of Biology: Biodiversity, Ecology,
and Evolution LaboratoryBIOL 2110G Principles of Biology: Cellular and Molecular
& BIOL 2110L Biology and Principles of Biology: Cellular and
Molecular Biology LaboratoryCHEM 1120G Introduction to Chemistry Lecture and
Laboratory (non majors)CHEM 1215G General Chemistry I Lecture and Laboratory for
STEM Majors

ENVS 1110G Environmental Science I

GEOG 1110G Physical Geography

GEOL 1110G Physical Geology

PHYS 1115G Survey of Physics with Lab

PHYS 1230G Algebra-Based Physics I
& PHYS 1230L and Algebra-Based Physics I Lab

PHYS 1125G Physics of Music

Area V: Humanities

Choose one from the following: 3

ENGL 1410G Introduction to Literature

ENGL 2520G Film as Literature

ENGL 2310G Introduction to Creative Writing

ENGL 2650G World Literature I

HIST 1130G World History I
or HIST 1140G World History II

HIST 1160G Western Civilization II

HIST 1110G United States History I
or HIST 1120G United States History IIHIST 2250G East Asia to 1600
or HIST 2251G East Asia since 1600HIST 2245G Islamic Civilization to 1500
or HIST 2246G Islamic Civilizations since 1800

PHIL 1145G Philosophy, Law, and Ethics

PHIL 1115G Introduction to Philosophy

PHIL 1140G Philosophy and World Religions

PHIL 2230G Philosophical Thought

PHIL 1120G Logic, Reasoning, & Critical Thinking

Area VI: Creative and Fine Arts

Choose one from the following: 3

ARTH 1115G Orientation in Art

ARTS 1145G Visual Concepts

DANC 1110G Dance Appreciation

MUSC 1130G Music Appreciation: Western Music

MUSC 1110G Music Appreciation: Jazz

THEA 1110G Introduction to Theatre

General Education Elective

Choose one additional Area V: Humanities Course from the list above 3

Viewing A Wider World ² 6**Departmental/College Requirements**

ECED 1110 Child Growth, Development, and Learning 3

ECED 1115 Health, Safety, and Nutrition 2

ECED 1130 Family and Community Collaboration 3

ECED 2115 Introduction to Language, Literacy, and
Reading 3ECED 1125 Assessment of Children and Evaluation of
Programs 3

ECED 1120 Guiding Young Children 3

EDUC 3120 Multicultural Education 3

SPED 3105 Introduction to Special Education in a Diverse
Society 3**ECED Courses for Major:**ECED 2120 Curriculum Development through Play Birth
through Age 4 (PreK) 3ECED 2121 Curriculum Development through Play Birth
through Age 4 (PreK) Practicum 2ECED 2130 Curriculum Development and Implementation
Age 3 (PreK) through Grade 3 3ECED 2131 Curriculum Development and Implementation
Age 3 (PreK) through Grade 3 Practicum 2

ECED 2110 Professionalism 2

ECED 3110 Research in Child, Growth, Development and
Learning 3

ECED 3120 Family, Language, and Culture 3

ECED 3210 Emergent Literacy 3

ECED 4210 Integrated Early Childhood Curriculum 4

ECED 4211 Integrated Curriculum Practicum 2

ECED 4110 Young Children with Diverse Abilities 3

ECED 4120 Assessment of Young Children, Birth-Eight 3

ECED 4220 Advanced Caregiving for Infants and Toddlers 3

Non-Departmental Requirements (in addition to Gen.Ed/VWW)MATH 1134 Fundamentals of Elementary Mathematics I
(MATH 1215 is prerequisite) 3

Choose two courses from the following: 6

ANTH 1115G Introduction to Anthropology

ECON 1110G Survey of Economics

ECON 2110G Macroeconomic Principles

ECON 2120G Principles of Microeconomics

GEOG 1120G World Regional Geography

or GEOG 1130G Human Geography

POLS 1120G American National Government

or POLS 1110G Introduction to Political Science

SOCI 1110G Introduction to Sociology

GNDR 2110G Introduction to Women, Gender, and Sexuality
Studies

or GNDR 2120G Representing Women Across Cultures

Second Language: (required) 0-8*Spanish or Sign-Language preferred* ³**Electives, to bring the total credits to 120** ⁴ **5-13**

Electives: Minimum of 6 upper division (300-400) elective credits

Total Credits 120¹ See the General Education (p. 220) section of the catalog for a full list of courses² See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.³ All ECED (Non-Licensure) majors must complete two semesters of language courses, preferably American Sign Language or Spanish. (However, if students have fluency in an Indigenous language or wish

to take something different than Spanish or Sign Language, please see Director of ECED for permission and/or process).

- ⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1134 Fundamentals of Elementary Mathematics I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
ECED 1110	Child Growth, Development, and Learning	3
ECED 1115	Health, Safety, and Nutrition	2
First Course in Second Language Series		3-4
Credits		15-16
Semester 2		
MATH 1134	Fundamentals of Elementary Mathematics I ¹	3
ECED 1130	Family and Community Collaboration ¹	3
Area IV: Social and Behavioral Science Course for the Requirements tab ³		3
Area V: Humanities Course ²		3
Next Course in Second Language Series ¹		3-4
Credits		15-16

Second Year

Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science ¹	3
MATH 2134G	Fundamentals of Elementary Math II ¹	3
ECED 2115	Introduction to Language, Literacy, and Reading	3
ECED 1125	Assessment of Children and Evaluation of Programs	3
Area III: Laboratory Science Course ¹		4
Credits		16
Semester 2		
ECED 2120 & ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) and Curriculum Development through Play Birth through Age 4 (PreK) Practicum	5
ECED 1120	Guiding Young Children	3
An additional Area V: Humanities Course ²		3
Area VI: Fine Arts Course ²		3
Area III: Laboratory Sciences Course ²		4
Credits		18

Third Year

Semester 1

COMM 1115G	Introduction to Communication	3
EDUC 3120	Multicultural Education	3
ECED 2130 & ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 and Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	5
ECED 2110	Professionalism	2
Upper-Division Elective Course		3
Credits		16

Semester 2

SPED 3105	Introduction to Special Education in a Diverse Society	3
VWW: Viewing a Wider World Course ⁴		3
Area IV: Social/Behavioral Sciences Course from the Requirements tab ³		3
Upper-Division Elective Course		3
Elective course		1
Credits		13

Fourth Year

Semester 1

ECED 3210	Emergent Literacy	3
ECED 4220	Advanced Caregiving for Infants and Toddlers	3
ECED 4210	Integrated Early Childhood Curriculum	4
ECED 4211	Integrated Curriculum Practicum	2
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
Credits		12

Semester 2

ECED 3110	Research in Child, Growth, Development and Learning	3
ECED 3120	Family, Language, and Culture	3
ECED 4110	Young Children with Diverse Abilities	3
ECED 4120	Assessment of Young Children, Birth-Eight	3
VWW: Viewing a Wider World Course ⁴		3
Credits		15
Total Credits		120-122

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ **Area IV: Social/Behavioral Sciences Courses:**

- ANTH 1115G Introduction to Anthropology
- ECON 1110G Survey of Economics
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics
- GEOG 1120G World Regional Geography
- GEOG 1130G Human Geography
- POLS 1120G American National Government
- POLS 1110G Introduction to Political Science
- GNDR 2110G Introduction to Women, Gender, and Sexuality Studies
- GNDR 2120G Representing Women Across Cultures

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Early Childhood Education - Bachelor of Science in Education

All students wishing to complete a degree in Early Childhood Education (licensure track) must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass ENGL 1110G Composition I, ENGL 2221G Writing in the Humanities and Social Science, Area II, Prerequisite courses, and Early Childhood Core courses with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2221G	Writing in the Humanities and Social Science	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 2134G	Fundamentals of Elementary Math II	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	11
<i>Area III: Laboratory Science Courses (must be from two different areas), for 8 credits:</i>		
<i>Area V: Humanities</i>		
Choose one of the following		3
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
<i>Area VI: Creative and Fine Arts</i>		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		

HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing a Wider World Courses (from two different colleges) ¹		6
Departmental/College Requirements		
<i>Professional Education Courses</i>		
ECED 1110	Child Growth, Development, and Learning ²	3
ECED 1115	Health, Safety, and Nutrition ²	2
ECED 1130	Family and Community Collaboration ²	3
ECED 2115	Introduction to Language, Literacy, and Reading ²	3
ECED 1125	Assessment of Children and Evaluation of Programs ²	3
ECED 1120	Guiding Young Children ²	3
EDUC 3120	Multicultural Education ^{2,3}	3
EDLT 3110	Integrating Technology with Teaching ²	3
SPED 3105	Introduction to Special Education in a Diverse Society ²	3
<i>Early Childhood Core Courses</i>		
ECED 2120	Curriculum Development through Play Birth through Age 4 (PreK) ²	3
ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) Practicum	2
ECED 2130	Curriculum Development and Implementation Age 3 (PreK) through Grade 3	3
ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	2
ECED 2110	Professionalism	2
<i>ECED Spring Block</i>		
ECED 3110	Research in Child, Growth, Development and Learning	3
ECED 3120	Family, Language, and Culture	3
ECED 4110	Young Children with Diverse Abilities ⁴	3
ECED 4120	Assessment of Young Children, Birth-Eight ⁴	3
<i>ECED Teaching Methods Fall Block</i>		
ECED 4310	Early Primary Field Placement ⁴	2
ECED 4250	Teaching and Learning Math and Science ⁴	4
ECED 4260	Teaching and Learning Social Studies, Fine Arts and Movement ⁴	3
ECED 4320	Teaching and Learning Reading and Writing ⁴	3
<i>Student Teaching</i>		
ECED 4810	Student Teaching/Seminar Early Childhood	3
SPED 4810	Early Childhood SPED Student Teaching	9
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1134	Fundamentals of Elementary Mathematics I	3
Choose two courses from the following for additional licensure requirements:		6
ANTH 1115G	Introduction to Anthropology	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
GEOG 1120G	World Regional Geography	
or GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
or POLS 1110G	Introduction to Political Science	
SOCI 1110G	Introduction to Sociology	
Electives, to bring the total credits to 122		0
Total Credits		122

¹ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

² Courses are pre/corequisites for Teacher Education Program (TEP)

³ EDUC 3120 Multicultural Education must be taken prior to TEP portfolio submission.

⁴ Courses require admission to the TEP

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1215 Intermediate Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
ECED 1110	Child Growth, Development, and Learning	3
ECED 1115	Health, Safety, and Nutrition	2
Area VI: Creative and Fine Arts Course ²		3
Licensure Required: Social and Behavioral Science Course ³		3
Credits		15

Semester 2

MATH 1134	Fundamentals of Elementary Mathematics I ¹	3
CEPY 1120G	Human Growth and Behavior	3
HIST 1110G or HIST 1120G	United States History I or United States History II	3
ECED 1130	Family and Community Collaboration	3
Licensure Required: Social and Behavioral Science Course ³		3
Credits		15

Second Year

Semester 1		Credits
ENGL 2221G	Writing in the Humanities and Social Science ¹	3
MATH 2134G	Fundamentals of Elementary Math II ¹	3
ECED 2115	Introduction to Language, Literacy, and Reading	3
ECED 1125	Assessment of Children and Evaluation of Programs	3
Area III: Laboratory Science Course ²		4
Credits		16

Semester 2

COMM 1115G	Introduction to Communication	3
ECED 2120	Curriculum Development through Play Birth through Age 4 (PreK)	3
ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) Practicum	2
ECED 1120	Guiding Young Children	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
EDUC 3120	Multicultural Education	3
Credits		17

Third Year

Semester 1	
APPLY TO TEACHER EDUCATION PROGRAM (TEP)	

HIST 1130G or HIST 1140G	World History I or World History II	3
ECED 2130	Curriculum Development and Implementation Age 3 (PreK) through Grade 3	3
ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	2
EDLT 3110	Integrating Technology with Teaching	3
ECED 2110	Professionalism	2
Area III: Laboratory Science Course ²		4
Credits		17

Semester 2

APPLY TO STUDENT TEACHING		Credits
ECED 3110	Research in Child, Growth, Development and Learning (Spring Only)	3
ECED 3120	Family, Language, and Culture (Spring Only)	3
ECED 4110	Young Children with Diverse Abilities (Spring Only)	3
ECED 4120	Assessment of Young Children, Birth-Eight (Spring Only)	3
VWW: Viewing a Wider World Course ⁴		3
Credits		15

Fourth Year

Semester 1		Credits
SUBMIT STEP PACKET		
ECED 4250	Teaching and Learning Math and Science (Fall Only)	4
ECED 4260	Teaching and Learning Social Studies, Fine Arts and Movement (Fall Only)	3
ECED 4320	Teaching and Learning Reading and Writing (Fall Only)	3
ECED 4310	Early Primary Field Placement (Fall Only)	2
VWW: Viewing a Wider World Course ⁴		3
Credits		15

Semester 2

ECED 4810	Student Teaching/Seminar Early Childhood	3
SPED 4810	Early Childhood SPED Student Teaching	9
Credits		12
Total Credits		122

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ Additional Social/Behavioral Science Courses to fulfill licensure requirements, choose from the following courses:

- ANTH 1115G Introduction to Anthropology
- ECON 1110G Survey of Economics
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics
- GEOG 1120G World Regional Geography
- GEOG 1130G Human Geography
- POLS 1110G Introduction to Political Science
- POLS 1120G American National Government
- SOCI 1110G Introduction to Sociology

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Educational Leadership - Bachelor of Science

The BS in Educational Leadership (EL) prepares students to work at the bachelor's level in areas such as university or community college career services, admissions, financial aid, and advising.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Courses		
<i>Area I: Communications</i>		<i>10</i>
<i>English Composition - Level 1</i> ¹		
<i>English Composition - Level 2</i> ¹		
<i>Oral Communication</i> ¹		
<i>Area II: Mathematics</i> ^{1,2}		<i>3-4</i>
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		<i>10-11</i>
<i>Area III: Laboratory Sciences Course (4 credits)</i> ¹		
<i>Area IV: Social/Behavioral Sciences Course (3 credits)</i> ¹		
<i>Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits)</i> ¹		
<i>Area V: Humanities</i> ¹		<i>3</i>
<i>Area VI: Creative and Fine Arts</i> ¹		<i>3</i>
<i>General Education Elective</i> ¹		<i>3-4</i>
Viewing a Wider World ³		6
Departmental/College Requirements		
<i>Core Courses</i>		
ELAD 2340	Multicultural Leadership in Education	3
ELAD 2210	Leadership and Change in Education	3
ELAD 3210	Current Issues In Educational Leadership	3
ELAD 4110	Management of Student Services	3
ELAD 4120	Principles of Education Law and Policy	3
ELAD 4130	Principles of Education Budgeting and Finance	3
ELAD 4510	Elements of Research	3
ELAD 4998	Internship	6
CEPY 1120G	Human Growth and Behavior	3
CEPY 3210V	Human Relations Training	3
CEPY 4110V	Introduction to Counseling	3
CEPY 4150	Psychology, Multiculturalism and Counseling	3
Second Language: (not required)		
Electives, to bring the total credits to 120 ⁵		40-43
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study For Students

This roadmap assumes student placement into a Mathematics course and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		Credits
ELAD 2210	Leadership and Change in Education	3
ENGL 1110G	Composition I	4
General Education Course (Area I-VI or GE Elective) ¹		3-4
Elective Course ²		3
Elective Course ²		3
Credits		16-17

Spring

ELAD 2340	Multicultural Leadership in Education	3
CEPY 1120G	Human Growth and Behavior	3
General Education Course (Area I-VI or GE Elective) ¹		3-4
General Education Course (Area I-VI or GE Elective) ¹		3-4
Elective Course ²		3
Credits		15-17

Second Year

Fall		
ELAD 3210	Current Issues In Educational Leadership	3
General Education Course (Area I-VI or GE Elective) ¹		4
General Education Course (Area I-VI or GE Elective) ¹		3-4
Elective Course ²		3
Viewing a Wider World ³		3
Credits		16-17

Spring

ELAD 4110	Management of Student Services	3
CEPY 4110V	Introduction to Counseling	3
General Education Course (Area I-VI or GE Elective) ¹		3-4
General Education Course (Area I-VI or GE Elective) ¹		3-4
Viewing a Wider World Course ³		3
Credits		15-17

Third Year

Fall		
ELAD 4120	Principles of Education Law and Policy	3
CEPY 3210V	Human Relations Training	3
General Education Course (Area I-VI or GE Elective) ¹		3-4
Elective Course ²		3
Elective Course ²		3
Credits		15-16

Spring

ELAD 4130	Principles of Education Budgeting and Finance	3
ELAD 4510	Elements of Research	3

General Education Course (Area I-VI or GE Elective) ¹	3-4
Elective Course ²	3
Elective Course ²	3
Credits	15-16
Fourth Year	
Fall	
ELAD 4998 Internship	3
CEPY 4150 Psychology, Multiculturalism and Counseling	3
Elective Course ²	3
Elective Course ²	3
Elective Course ²	3
Credits	15
Spring	
ELAD 4998 Internship	3
Elective Course ²	3
Elective Course ²	3
Elective Course ²	4
Credits	13
Total Credits	120-128

¹ See the General Education (p. 220) Section of the catalog for a full list of courses

² Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

³ See the Viewing a Wider World (p. 224) Section of the catalog for a full list of courses

Elementary Education (Language Arts K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation. The B.S. Elementary Education degree embeds the Language Arts Teaching Field/Concentration and the Bilingual/TESL endorsements.

Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English. Additional teaching fields/concentrations are available in Social Studies, Science and Math but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentrations requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Courses		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ²	4
<i>English Composition - Level 2</i>		
ENGL 2221G	Writing in the Humanities and Social Science ^{1, 2}	3
or ENGL 2130G	Advanced Composition	
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication ¹	
COMM 1130G	Public Speaking ¹	
HNRS 2175G	Introduction to Communication Honors ¹	
<i>Area II: Mathematics</i>		
MATH 2134G	Fundamentals of Elementary Math II ²	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
<i>Area III: Laboratory Sciences Course ³</i>		
Choose two different subjects from the following:		8
ASTR 1120G	The Planets Lecture & Laboratory	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 1120G	Human Biology	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G	Algebra-Based Physics I	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 1240G	Algebra-Based Physics II	
PHYS 1240L	Algebra-Based Physics II Lab	
<i>Area IV: Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
<i>Area V: Humanities</i>		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	

Area VI: Creative and Fine Arts

Choose one from the following: 3

ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	

General Education Elective

HIST 1130G	World History I	3
or HIST 1140G	World History II	

Viewing a Wider World ⁵ 6

Must be from two different colleges

Departmental/College Requirements

ENGL 363	Literature for Children and Young Adults ¹	3
CEPY 2110	Learning in the Classroom ²	3
EDLT 3110	Integrating Technology with Teaching ²	3
BLED 1110	Introduction n Bilingual Education/ESL ²	3
EDUC 3120	Multicultural Education ^{2,6}	3
SPED 3105	Introduction to Special Education in a Diverse Society ²	3

Student Teaching Courses

EDUC 4810	Elementary Student Teaching ⁷	9
EDUC 4811	Elementary Student Teaching Seminar ⁷	3

Elementary Education Teaching Methods Courses**Block A**

BLED 3130	Language, Literacy, and Culture in the ESL Classrooms ^{4,7}	3
EDUC 4310	Methods of Teaching Elementary School Science ⁷	3
EDUC 4320	Methods of Teaching Elementary School Mathematics ⁷	3
READ 4310	Elementary School Literacy I ^{1,7}	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁷	3

Block B

BLED 4110	Second Language Acquisition ^{4,7}	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ^{4,7}	3
EDUC 4330	Methods of Teaching Elementary School Social Studies ⁷	3
READ 4320	Elementary School Literacy II ^{1,7}	3
READ 3110	Instruction for Special Reading Needs ^{1,7}	3

Bilingual/ESL Education Endorsement Courses

BLED 2110	Bilingual Methods ^{2,4}	3
LING 302V	Language and Society ^{1,4}	3
SPED 3110	Bilingual/Multicultural Special Education ^{4,7}	3
BLED 3140	Issues in Schooling for Bilingual Learners ^{4,7}	3

Non-Departmental Requirements

MATH 1134	Fundamentals of Elementary Mathematics I ²	3
LING 2110G	Introduction to the Study of Language and Linguistics	3

Choose one course from the following for additional licensure requirements: 3

GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	

Second Language: (for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESOL endorsement, six credits of a language other than English is required.) ⁸**Electives, to bring the total credits to 120** ⁹ 0**Total Credits** 120¹ Language Arts Concentration/Teaching Field Course² Courses are pre/corequisites for Teacher Education Program (TEP)³ See the General Education (p. 220) section of the catalog for a full list of courses⁴ Bilingual/TESOL Endorsement course⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.⁶ EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.⁷ Courses require admission to the TEP⁸ For certification in the State of New Mexico the Bilingual/TESOL endorsements require 6 credits of a language other than English.⁹ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1134 Fundamentals of Elementary Mathematics I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year**Semester 1** **Credits**ENGL 1110G Composition I ¹ 4

CEPY 1120G Human Growth and Behavior 3

Choose from one of the following: 3

GEOG 1120G World Regional Geography

GEOG 1130G Human Geography

POLS 1110G Introduction to Political Science

POLS 1120G American National Government

Choose from one of the following: 3

HIST 1110G United States History I

HIST 1120G United States History II

Area VI: Creative and Fine Arts Course ² 3**Credits** 16**Semester 2**

COMM 1115G Introduction to Communication 3

MATH 1134 Fundamentals of Elementary Mathematics I ¹ 3

Choose from one of the following: 3

HIST 1130G World History I

HIST 1140G World History II

BLED 2110 Bilingual Methods 3

BLED 1110 Introduction n Bilingual Education/ESL 3

Credits 15

Second Year**Semester 1**

ENGL 2221G or ENGL 2130G	Writing in the Humanities and Social Science or Advanced Composition	3
MATH 2134G	Fundamentals of Elementary Math II ¹	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
CEPY 2110	Learning in the Classroom	3
Students who need to enroll in 15 credits for Financial Aid purposes may need to enroll in additional credits		
Credits		12

Semester 2

ENGL 363	Literature for Children and Young Adults	3
EDUC 3120	Multicultural Education	3
EDLT 3110	Integrating Technology with Teaching	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Science Course ²		4
Credits		16

Third Year**Semester 1**

APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
BLED 3140	Issues in Schooling for Bilingual Learners (Fall Only)	3
LING 302V	Language and Society	3
Area III: Laboratory Science Course ²		4
VWW: Viewing a Wider World Course ³		6
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
Credits		16

Semester 2

APPLY TO STUDENT TEACHING		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms (Spring only) ¹	3
EDUC 4310	Methods of Teaching Elementary School Science (Spring Only) ¹	3
EDUC 4320	Methods of Teaching Elementary School Mathematics (Spring Only) ¹	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Spring Only) ¹	3
READ 4310	Elementary School Literacy I	3
SPED 3110	Bilingual/Multicultural Special Education	3
Credits		18

Fourth Year**Semester 1**

SUBMIT STEP PACKET		
READ 3110	Instruction for Special Reading Needs	3
BLED 4110	Second Language Acquisition	3
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4330	Methods of Teaching Elementary School Social Studies	3
READ 4320	Elementary School Literacy II	3
Credits		15

Semester 2

EDUC 4810	Elementary Student Teaching ¹	9
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EDUC 4811	Elementary Student Teaching Seminar	3
Credits		12
Total Credits		120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Elementary Education (Math K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation. The B.S. Elementary Education degree embeds the Match Teaching Field/Concentration and the Bilingual/TESL endorsements. **Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.** Additional teaching fields/concentrations are available in Social Studies, Science and Language Arts but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentrations requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 136 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ⁵	4
<i>English Composition - Level 2</i>		
ENGL 2221G or ENGL 2130G	Writing in the Humanities and Social Science ⁵ Advanced Composition	3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 2134G	Fundamentals of Elementary Math II ^{1, 5}	3

Area III/IV: Laboratory Sciences and Social/Behavioral SciencesChoose two different subjects with labs for a total of 8 credits **8**

ASTR 1120G	The Planets Lecture & Laboratory
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory
BIOL 1190G	Contemporary Problems in Biology
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
ENVS 1110G	Environmental Science I
GEOL 1110G	Physical Geology
GEOG 1110G	Physical Geography
PHYS 1115G	Survey of Physics with Lab
PHYS 1125G	Physics of Music
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab

Area IV: Social/Behavioral SciencesChoose one from the following: **3**

GEOG 1120G	World Regional Geography
GEOG 1130G	Human Geography
POLS 1110G	Introduction to Political Science
POLS 1120G	American National Government

Area V: Humanities

HIST 1130G	World History I	3
or HIST 1140G	World History II	

Area VI: Creative and Fine ArtsChoose one from the following: **3**

ARTH 1115G	Orientation in Art
DANC 1110G	Dance Appreciation
MUSC 1110G	Music Appreciation: Jazz
MUSC 1130G	Music Appreciation: Western Music
THEA 1110G	Introduction to Theatre

General Education Elective

HIST 1110G	United States History I	3
or HIST 1120G	United States History II	

Viewing a Wider World ⁴ **6**

Must be from two different colleges

Departmental/College Requirements

CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom	⁵ 3
EDLT 3110	Integrating Technology with Teaching	⁵ 3
bled 1110	Introduction n Bilingual Education/ESL	^{2, 5} 3
EDUC 3120	Multicultural Education	^{5,6} 3

SPED 3105	Introduction to Special Education in a Diverse Society	⁵ 3
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LING 2110G	Introduction to the Study of Language and Linguistics	3
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Student Teaching Courses

EDUC 4810	Elementary Student Teaching	⁷ 9
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EDUC 4811	Elementary Student Teaching Seminar	⁷ 3
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Elementary Education Teaching Methods Courses**Block A**

bled 3130	Language, Literacy, and Culture in the ESL Classrooms	^{2,7} 3
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EDUC 4310	Methods of Teaching Elementary School Science	⁷ 3
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EDUC 4320	Methods of Teaching Elementary School Mathematics	^{1,7} 3
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READ 4310	Elementary School Literacy I	⁷ 3
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SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society	⁷ 3
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Block B

bled 3120	Sheltered English Instruction for the ESL Classroom	^{2,7} 3
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bled 4110	Second Language Acquisition	^{2,7} 3
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EDUC 4330	Methods of Teaching Elementary School Social Studies	⁷ 3
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READ 4320	Elementary School Literacy II	⁷ 3
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READ 3110	Instruction for Special Reading Needs	⁷ 3
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Bilingual/TESL Education Endorsement Courses

bled 2110	Bilingual Methods	^{2,5} 3
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SPED 3110	Bilingual/Multicultural Special Education	^{2,7} 3
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LING 302V	Language and Society	² 3
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bled 3140	Issues in Schooling for Bilingual Learners	² 3
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Concentration/Teaching Field Courses: Math K-8

MATH 1215	Intermediate Algebra	¹ 3
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MATH 1220G	College Algebra	¹ 3
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MATH 1430G	Applications of Calculus I	¹ 3
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MATH 1511G	Calculus and Analytic Geometry I	¹ 4
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MATH 1350G	Introduction to Statistics	¹ 3
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Non-Departmental Requirements

MATH 1134	Fundamentals of Elementary Mathematics I	¹ 3
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ENGL 363	Literature for Children and Young Adults	3
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Second Language: ⁸

for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESL endorsement, six credits of a language other than English is required

Electives, to bring the total credits to 136 **0****Total Credits** **136**¹ Mathematics Concentration/Teaching Field Course² Bilingual/TESOL Endorsement course³ See the General Education (p. 220) section of the catalog for a full list of courses⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.⁵ Courses are pre/corequisites for Teacher Education Program (TEP)⁶ EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.⁷ Courses require admission to the TEP

⁸ For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.

Elementary Education (Science K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation (HEST). The B.S. Elementary Education degree embeds the Science Teaching Field/Concentration and the Bilingual/TESL endorsements. **Note: For certification in the State of New Mexico, the Bilingual/TESL endorsements require 6 credits of a language other than English.** Additional teaching fields/concentrations are available in Social Studies, Language Arts, and Math but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentrations requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 136 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
ENGL 2221G	Writing in the Humanities and Social Science ¹	3
or ENGL 2130G	Advanced Composition	
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 2134G	Fundamentals of Elementary Math II ¹	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
Choose two different subjects with labs for a total of 8 credits ²		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
<i>Area IV: Social/Behavioral Sciences</i>		
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
<i>Area V: Humanities</i>		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
<i>Area VI: Creative and Fine Arts</i>		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing a Wider World ³		6
Must be from two different colleges		
Departmental/College Requirements		
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom ¹	3
EDLT 3110	Integrating Technology with Teaching ¹	3
BLD 1110	Introduction n Bilingual Education/ESL ¹	3
EDUC 3120	Multicultural Education ^{1,4}	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
LING 302V	Language and Society ⁵	3
LING 2110G	Introduction to the Study of Language and Linguistics ⁵	3
<i>Student Teaching Courses</i>		
EDUC 4810	Elementary Student Teaching ⁶	9
EDUC 4811	Elementary Student Teaching Seminar ⁶	3
<i>Elementary Education Teaching Methods Courses</i>		

Block A		
BLD 3130	Language, Literacy, and Culture in the ESL Classrooms ^{5,6}	3
EDUC 4310	Methods of Teaching Elementary School Science ⁶	3
EDUC 4320	Methods of Teaching Elementary School Mathematics ⁶	3
READ 4310	Elementary School Literacy I ⁶	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁶	3
Block B		
BLD 4110	Second Language Acquisition ^{5,6}	3
BLD 3120	Sheltered English Instruction for the ESL Classroom ^{5,6}	3
EDUC 4330	Methods of Teaching Elementary School Social Studies ⁶	3
READ 4320	Elementary School Literacy II ⁶	3
READ 3110	Instruction for Special Reading Needs ⁶	3
Bilingual/TESL Education Endorsement Courses		
BLD 3140	Issues in Schooling for Bilingual Learners	3
BLD 2110	Bilingual Methods ^{4,5}	3
SPED 3110	Bilingual/Multicultural Special Education ^{5,6}	3
Concentration/Teaching Field Courses: Science (K-8)		
ASTR Elective Course		3
BIOL Elective Course		3
CHEM or PHYS Elective Course		3
GEOL or Physical GEOG Elective Course		3
Science Elective Course		4
Non-Departmental Requirements		
MATH 1134	Fundamentals of Elementary Mathematics I ¹	3
ENGL 363	Literature for Children and Young Adults	3
Second Language:⁷		
for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESL endorsement, six credits of a language other than English is required		
Electives, to bring the total credits to 136		0
Total Credits		136

¹ Courses are pre/corequisites for Teacher Education Program (TEP)

² Science Concentration/Teaching Field Course

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁴ EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.

⁵ Bilingual/TESL Endorsement course

⁶ Courses require admission to the TEP

⁷ For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.

Elementary Education (Social Studies K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation. The B.S. Elementary Education degree embeds the

Social Studies Teaching Field/Concentration and the Bilingual/TESL endorsements. **Note: For certification in the State of New Mexico, the Bilingual/TESL endorsements require 6 credits of a language other than English.** Additional teaching fields/concentrations are available in Language Arts, Science, and Math but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentrations requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 132 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ⁵	4
<i>English Composition - Level 2</i>		
ENGL 2221G	Writing in the Humanities and Social Science ⁵	3
or ENGL 2130G	Advanced Composition	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II ⁵	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences Course(s)		
Choose two different subjects for a total of 8 credits		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	

Area IV: Social/Behavioral Sciences²

Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	

Area V: Humanities

HIST 1130G	World History I	3
or HIST 1140G	World History II	

Area VI: Creative and Fine Arts

Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	

General Education Elective

HIST 1110G	United States History I	3
or HIST 1120G	United States History II	

Viewing a Wider World⁴

Must be from two different colleges

Departmental/College Requirements**College of Education Requirements**

BLED 1110	Introduction to Bilingual Education/ESL	3
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom	3
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
EDLT 3110	Integrating Technology with Teaching	3
LING 2110G	Introduction to the Study of Language and Linguistics	3

Student Teaching Courses

EDUC 4810	Elementary Student Teaching	9
EDUC 4811	Elementary Student Teaching Seminar	3

Elementary Education Teaching Methods Courses**Block A**

BLED 3130	Language, Literacy, and Culture in the ESL Classrooms	3
EDUC 4310	Methods of Teaching Elementary School Science	3
EDUC 4320	Methods of Teaching Elementary School Mathematics	3
READ 4310	Elementary School Literacy I	3

SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
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Block B

BLED 4110	Second Language Acquisition	3
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4330	Methods of Teaching Elementary School Social Studies	3
READ 4320	Elementary School Literacy II	3
READ 3110	Instruction for Special Reading Needs	3

Bilingual/TESOL Education Endorsement Courses

BLED 3140	Issues in Schooling for Bilingual Learners	3
BLED 2110	Bilingual Methods	3
SPED 3110	Bilingual/Multicultural Special Education	3

Concentration Courses: Science (K-8)

ANTH, ECON, GEOG, POLS, or SOCI Elective Course		9
HIST Elective Course		3
HIST 368	Teaching History	3

Non-Departmental Requirements

MATH 1134	Fundamentals of Elementary Mathematics I	3
ENGL 363	Literature for Children and Young Adults	3

Second Language:⁸

for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESL endorsement, six credits of a language other than English is required

Electives, to bring the total credits to 132	0
Total Credits	132

¹ Bilingual/TESOL Endorsement course² See the General Education (p. 220) section of the catalog for a full list of courses³ Social Studies Concentration/Teaching Field Course⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.⁵ Courses are pre/corequisites for Teacher Education Program (TEP)⁶ EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.⁷ Courses require admission to the TEP⁸ For certification in the State of New Mexico the Bilingual/TESOL endorsements require 6 credits of a language other than English.

Secondary Education (Secondary Education General Science) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The below programs are labeled as Concentrations in the catalog and on student transcripts, but are also recognized at "Teaching Fields" for the Teacher Education Program.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework

will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the **departmental website**. A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a grade of C- or better.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
Choose one from the following: ¹		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{1, 2}	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CEPY 1120G	Human Growth and Behavior	3
<i>Area V: Humanities</i>		
Choose one from the following		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 2245G	Islamic Civilization to 1500	
HIST 2246G	Islamic Civilizations since 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
<i>Area VI: Creative and Fine Arts</i>		
Choose one from the following: ³		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	

THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		
Choose one additional Creative and Fine Arts course from above		3
Viewing A Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWV requirements will be satisfied with the concentration/teaching field courses ⁴		
Departmental/College Requirements		
<i>Education Core Courses</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1, 5}	3
EDUC 3120	Multicultural Education ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching ¹	3
EDUC 3997	Secondary Field Experience ^{1, 5}	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ⁶	3
EDUC 4510	Data Literacy and Assessment ⁶	3
EDUC 4530	Science for Educators ⁶	3
EDUC 4520	Contemporary Issues in Education ^{5, 6}	3
EDUC 4410	Teaching Science at the Middle and High School Level ^{5, 6}	3
READ 4330	Content Area Literacy ⁶	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁶	3
<i>Student Teaching</i>		
EDUC 4820	Secondary Student Teaching ⁶	9
EDUC 4821	Middle and High School Student Teaching Seminar ⁶	3
<i>General Science Concentration/Teaching Field Courses</i>		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab ¹	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 467	Evolution	3

BIOL 300+ Plant Science Elective	3
Second Language: (not required)	
Non-Departmental Requirements	
Choose one from the following:	3-4
MATH 1430G Applications of Calculus I	
MATH 1511G Calculus and Analytic Geometry I	
MATH 1521G Calculus and Analytic Geometry II	
MATH 2350G Statistical Methods	
A ST 311 Statistical Applications	
GEOG 1120G World Regional Geography	3
or GEOG 1130G Human Geography	
Choose an additional Area IV from the following	3
ANTH 1137G Human Ancestors	
ANTH 1140G Introduction to Cultural Anthropology	
ANTH 1115G Introduction to Anthropology	
ANTH 1160G World Archaeology	
SOCI 1110G Introduction to Sociology	
SOCI 2310G Contemporary Social Problems	
Electives, to bring the total credits to 121	0
Total Credits	121-123

¹ Courses are prerequisites/co-requisites for Teacher Education Program (TEP)

² MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.

³ See the General Education (p. 220) section of the catalog for a full list of courses

⁴ The 9 credits of Upper-Division BIOL courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWV requirement.

⁵ Courses require Field Experience

⁶ Courses require admission to the TEP

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra ¹	3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory ¹	4
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
Credits		14
Semester 2		
COMM 1115G	Introduction to Communication	3
MATH 1430G	Applications of Calculus I ¹	3

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
EDUC 1185	Introduction to Secondary Education and Youth	3
GEOG 1120G or GEOG 1130G	World Regional Geography or Human Geography	3
Credits		16
Second Year		
Semester 1		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory ¹	4
ENGL 2221G	Writing in the Humanities and Social Science ¹	3
Area V: Any "G" Course with a HIST Prefix ²		3
Area VI: Creative and Fine Arts Course ²		3
Area IV: Social/Behavioral Science Course		3
Credits		16
Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
EDUC 3120	Multicultural Education	3
BIOL 301	Principles of Ecology ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area VI: Creative and Fine Arts Course ²		3
Credits		16
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
LIBR 311V	Information Literacy	3
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience (Fall Only)	3
BIOL 305	Principles of Genetics ¹	3
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	4
Credits		16
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom ¹	3
EDUC 4510	Data Literacy and Assessment (Spring Only) ¹	3
EDUC 4520	Contemporary Issues in Education (Spring Only) ¹	3
EDUC 4530	Science for Educators (Spring Only) ¹	3
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II ¹	4
Credits		16
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
READ 4330	Content Area Literacy (Fall Only) ¹	3
EDUC 4410	Teaching Science at the Middle and High School Level (Fall Only) ¹	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ¹	3
300-Level Plant Science Elective Course		3

BIOL 467	Evolution ¹	3
Credits		15
Semester 2		
EDUC 4820	Secondary Student Teaching ¹	9
EDUC 4821	Middle and High School Student Teaching Seminar ¹	3
Credits		12
Total Credits		121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 224) section of the catalog for a full list of courses.

Secondary Education (Secondary Education Language Arts) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The below programs are labeled as Concentrations in the catalog and on student transcripts, but are also recognized at "Teaching Fields" for the Teacher Education Program. Students should meet with the College of Education Educational Support and Resource Center for degree progress.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the **departmental website**. A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a grade of C- or better.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2 ¹</i>		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2215G	Advanced Technical and Professional Communication	
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	

HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ¹	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences</i>		
Choose two courses (from different subject areas) for 8 credits		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
<i>Area IV: Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
<i>Area V: Humanities</i>		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
<i>Area VI: Creative and Fine Arts</i>		
THEA 1110G	Introduction to Theatre	3
<i>General Education Elective</i>		
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
Viewing a Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWV requirements will be satisfied with the concentration/teaching field courses ²		
Departmental/College Requirements		
<i>Education Core Courses</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1,3}	3
EDUC 3120	Multicultural Education ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching ¹	3
EDUC 3997	Secondary Field Experience ^{1,3}	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ⁴	3
EDUC 4510	Data Literacy and Assessment ⁴	3
EDUC 4520	Contemporary Issues in Education ^{3,4}	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level ^{3,4}	3
READ 4330	Content Area Literacy ⁴	3

SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁴	3
<i>Student Teaching</i>		
EDUC 4820	Secondary Student Teaching ⁴	9
EDUC 4821	Middle and High School Student Teaching Seminar ⁴	3
<i>Language Arts Concentration/Teaching Field Courses</i>		
ENGL 2610	American Literature I	3
or ENGL 2620	American Literature II	
ENGL 2630	British Literature I	3
or ENGL 2640	British Literature II	
ENGL 310	Critical Writing	3
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Choose one from the following:		3
ENGL 405	Chaucer	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
Select one from the following:		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
ENGL 416	Approaches to Literature	3
ENGL 470	Approaches to Composition	3
ENGL Elective 400/4000+		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
JOUR 105G	Media and Society	3
Choose one from the following:		3
ANTH 1115G	Introduction to Anthropology	
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Second Language: (not required)		
Electives, to bring the total credits to 120		0
Total Credits		120-121

¹ Courses are prerequisites/co-requisites for Teacher Education Program (TEP)

² The 9 credits of Upper-Division ENGL courses that are a part of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.

³ Courses require Field Experience

⁴ Courses require admission to the TEP

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra ¹	3-4
or MATH 1250G	or Trigonometry & Pre-Calculus	
JOUR 105G	Media and Society	3
THEA 1110G	Introduction to Theatre	3
Credits		16-17

Semester 2

COMM 1115G	Introduction to Communication	3
or COMM 1130G	or Public Speaking	
MATH 1130G	Survey of Mathematics ¹	3
or MATH 1430G	or Applications of Calculus I	
HIST 1150G	Western Civilization I	3
or HIST 1160G	or Western Civilization II	
EDUC 1185	Introduction to Secondary Education and Youth	3
ENGL 2610	American Literature I	3
or ENGL 2620	or American Literature II	
Credits		15

Second Year

Semester 1

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2215G	Advanced Technical and Professional Communication	
HIST 1110G	United States History I	3
or HIST 1120G	or United States History II	
ENGL 2630	British Literature I	3
or ENGL 2640	or British Literature II	
Area III: Laboratory Science Course ²		4
An ANTH/GEOG/POLS/SOCI Course ³		3
Credits		16

Semester 2

EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
ENGL 310	Critical Writing	3
Choose from one of the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	

Area III: Laboratory Science Course ²	4
Credits	16
Third Year	
Semester 1	
APPLY TO TEACHER EDUCATION PROGRAM (TEP)	
EDLT 3110 Integrating Technology with Teaching	3
EDUC 3997 Secondary Field Experience	3
ENGL 470 Approaches to Composition	3
LIBR 311V Information Literacy	3
400-Level English Literature Course ⁴	3
Credits	15
Semester 2	
BLED 3120 Sheltered English Instruction for the ESL Classroom (Spring Only) ¹	3
EDUC 4510 Data Literacy and Assessment ¹	3
EDUC 4520 Contemporary Issues in Education (Student Motivation (Spring Only))	3
ENGL 416 Approaches to Literature (Spring Only)	3
ENGL 408 Shakespeare I or ENGL 409 or Shakespeare II	3
Credits	15
Fourth Year	
Semester 1	
SUBMIT STEP PACKET	
READ 4330 Content Area Literacy (Fall Only) ¹	3
EDUC 4440 Teaching Language Arts at the Middle and High School Level (Fall Only) ¹	3
SPED 4150 Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only) ¹	3
400-Level English Literature Elective Course	3
Choose from one of the following:	3
ENGL 412 Writing in the Workplace	
ENGL 431 Technical Editing	
ENGL 449 Advanced Study in Writing	
ENGL 479 Computers and Writing	
Credits	15
Semester 2	
EDUC 4820 Secondary Student Teaching	9
EDUC 4821 Middle and High School Student Teaching Seminar	3
Credits	12
Total Credits	120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² Area III: Laboratory Sciences Courses:

- ASTR 1115G Introduction to Astronomy Lecture & Laboratory or ASTR 1120G The Planets Lecture & Laboratory
- BIOL 1120G Human Biology/BIOL 1120L
- BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution/BIOL 2610L Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
- BIOL 2110G Principles of Biology: Cellular and Molecular Biology/BIOL 2110L Principles of Biology: Cellular and Molecular Biology Laboratory

- CHEM 1120G Introduction to Chemistry Lecture and Laboratory (non majors)
- CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors
- CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors
- GEOL 1110G Physical Geology
- GEOG 1110G Physical Geography

³ ANTH/GEOG/POLS/SOCI Courses:

- ANTH 1115G Introduction to Anthropology
- ANTH 1137G Human Ancestors
- ANTH 1140G Introduction to Cultural Anthropology
- ANTH 1160G World Archaeology
- GEOG 1120G World Regional Geography
- GEOG 1130G Human Geography
- POLS 1120G American National Government
- POLS 1110G Introduction to Political Science
- POLS 1130G Issues in American Politics
- POLS 2120G International Relations
- SOCI 1110G Introduction to Sociology
- SOCI 2310G Contemporary Social Problems

⁴ 400-level Literature Courses:

- ENGL 405 Chaucer
- ENGL 442 Modern and Contemporary American Poetry
- ENGL 458 Latino/a Literature and Culture
- ENGL 469 Advanced Study in American Literature
- ENGL 481 Women's Literature

Secondary Education (Secondary Education Math) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The below programs are labeled as Concentrations in the catalog and on student transcripts, but are also recognized at "Teaching Fields" for the Teacher Education Program. Students should meet with the College of Education Educational Support and Resource Center for degree progress.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the **departmental website**. A 2.75 minimum GPA is required for admission to the Teacher

Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a grade of C- or better.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
Choose one from the following: ¹		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
CEPY 1120G	Human Growth and Behavior	3
<i>Area V: Humanities</i>		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
<i>Area VI: Creative and Fine Arts</i>		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
Viewing a Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses ³		
Departmental/College Requirements		
<i>Education Core Courses</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1,4}	3
EDUC 3120	Multicultural Education ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching ¹	3

EDUC 3997	Secondary Field Experience ^{1,4}	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ⁵	3
EDUC 4510	Data Literacy and Assessment ⁵	3
EDUC 4520	Contemporary Issues in Education ^{4,5}	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level ^{4,5}	3
READ 4330	Content Area Literacy ⁵	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁵	3
<i>Student Teaching</i>		
EDUC 4820	Secondary Student Teaching ⁵	9
EDUC 4821	Middle and High School Student Teaching Seminar ⁵	3
<i>Math Concentration/Teaching Field Courses</i>		
MATH 2530G	Calculus III	3
C S 111	Computer Science Principles	4
E T 182	Introduction to Digital Logic	2
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
STAT 371	Statistics for Engineers and Scientists I	3
or A ST 311	Statistical Applications	
Math elective 300/3000+		3
Math elective 300/3000+		3
Math elective 300/3000+		3
Non-Departmental Requirements		
MATH 1521G	Calculus and Analytic Geometry II	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Choose one from the following:		3
ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Second Language: (not required)		
Electives, to bring the total credits to 120		1
Total Credits		120

¹ Courses are prerequisites/co-requisites for Teacher Education Program (TEP)

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

³ The 9 credits of Upper-Division MATH courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.

⁴ Courses require Field Experience

⁵ Courses require admission to the TEP

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1511G	Calculus and Analytic Geometry I ¹	4
HIST 1110G or HIST 1120G	United States History I or United States History II	3
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		1

Credits 15

Semester 2

COMM 1115G or COMM 1130G or ACOM 1130G	Introduction to Communication or Public Speaking or Effective Leadership and Communication in Agriculture	3
MATH 1521G	Calculus and Analytic Geometry II ¹	4
EDUC 1185	Introduction to Secondary Education and Youth	3
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Area VI: Creative and Fine Arts Course ²		3

Credits 16

Second Year

Semester 1

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
MATH 2530G	Calculus III	3
PHYS 1230G or PHYS 1310G	Algebra-Based Physics I ¹ or Calculus -Based Physics I	3
PHYS 1230L or PHYS 1310L	Algebra-Based Physics I Lab ¹ or Calculus -Based Physics I Lab	1
HIST 1110G or HIST 1120G	United States History I or United States History II	3
An ANTH/GEOG/POLS/SOCI Course ³		3

Credits 16

Semester 2

PHYS 1240G or PHYS 1320G	Algebra-Based Physics II ¹ or Calculus -Based Physics II	3
PHYS 1240L or PHYS 1320L	Algebra-Based Physics II Lab ¹ or Calculus -Based Physics II Lab	1
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3

C S 111	Computer Science Principles	4
E T 182	Introduction to Digital Logic	2
Credits		16

Third Year

Semester 1

APPLY TO TEACHER EDUCATION PROGRAM (TEP)

LIBR 311V	Information Literacy	3
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience (Fall Only)	3
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3

Credits 15

Semester 2

BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring Only) ¹	3
EDUC 4510	Data Literacy and Assessment (Spring Only) ¹	3
EDUC 4520	Contemporary Issues in Education (Spring Only) ¹	3
A ST 311 or STAT 371	Statistical Applications ¹ or Statistics for Engineers and Scientists I	3
Upper-Division MATH Elective Course ¹		3

Credits 15

Fourth Year

Semester 1

SUBMIT STEP PACKET

READ 4330	Content Area Literacy (Fall Only) ¹	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level (Fall Only) ¹	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only) ¹	3
Upper-Division MATH Elective Course ¹		3
Upper-Division MATH Elective Course ¹		3

Credits 15

Semester 2

EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3

Credits 12

Total Credits 120

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 224) section of the catalog for a full list of courses.

³ ANTH/GEOG/POLS/SOCI Courses:

- ANTH 1137G Human Ancestors
- ANTH 1140G Introduction to Cultural Anthropology
- ANTH 1115G Introduction to Anthropology
- ANTH 1160G World Archaeology
- GEOG 1120G World Regional Geography
- GEOG 1130G Human Geography
- POLS 1120G American National Government
- POLS 1110G Introduction to Political Science
- POLS 1130G Issues in American Politics
- POLS 2120G International Relations

- SOCI 1110G Introduction to Sociology
- SOCI 2310G Contemporary Social Problems

Secondary Education (Secondary Education Social Studies) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The below programs are labeled as Concentrations in the catalog and on student transcripts, but are also recognized at "Teaching Fields" for the Teacher Education Program.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a grade of C- or better.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
Choose one from the following: ¹		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{1,2}	3
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
<i>Area III: Laboratory Sciences</i>		
Choose two courses from two different subject areas below:		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	

BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
<i>Area IV: Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
<i>Area V: Humanities</i>		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
<i>Area VI: Creative and Fine Arts ³</i>		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		
HIST 2250G	East Asia to 1600	3
or HIST 2251G	East Asia since 1600	
Viewing a Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWV requirements will be satisfied with the concentration/teaching field courses ⁴		
Departmental/College Requirements		
<i>Education Core Courses</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1,5}	3
EDUC 3120	Multicultural Education ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching ¹	3
EDUC 3997	Secondary Field Experience ^{1,5}	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ⁶	3
EDUC 4510	Data Literacy and Assessment ⁶	3
EDUC 4520	Contemporary Issues in Education ^{5,6}	3
EDUC 4996	Topics (Teaching History-spring only)	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level ^{5,6}	3
READ 4330	Content Area Literacy ⁶	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁶	3
<i>Student Teaching</i>		
EDUC 4820	Secondary Student Teaching ⁶	9

EDUC 4821	Middle and High School Student Teaching Seminar ⁶	3
<i>Social Studies Core Courses</i>		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
GEOG 2130	Map Use and Analysis	3
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
HIST 1110G	United States History I	3
HIST 1120G	United States History II	3
HIST 386	New Mexico History	3
HIST Elective 300+		3
HIST Elective 300+		3
Non-Departmental Requirements		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
GEOG 1130G	Human Geography	3
POLS 1120G	American National Government	3
or POLS 1110G	Introduction to Political Science	
Second Language: (not required)		
Electives, to bring the total credits to 120		0
Total Credits		120

¹ Courses are prerequisites/co-requisites for Teacher Education Program (TEP)

² MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.

³ See the General Education (p. 220) section of the catalog for a full list of courses

⁴ The 9 credits of Upper-Division ENGL courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.

⁵ Courses require Field Experience

⁶ Courses require admission to the TEP

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra ¹	3-4
or MATH 1250G	or Trigonometry & Pre-Calculus	
POLS 1120G	American National Government	3
or POLS 1110G	or Introduction to Political Science	
HIST 1130G	World History I	3
or HIST 1140G	or World History II	
Credits		16-17
Semester 2		
COMM 1115G	Introduction to Communication	3

MATH 1130G	Survey of Mathematics ¹	3
or MATH 1430G	or Applications of Calculus I	
GEOG 1130G	Human Geography	3
EDUC 1185	Introduction to Secondary Education and Youth	3
HIST 1110G	United States History I	3
Credits		15

Second Year

Semester 1

ENGL 2221G	Writing in the Humanities and Social Science ¹	3
Area III: Laboratory Science Course ²		4
ECON 2110G	Macroeconomic Principles	3
HIST 1150G	Western Civilization I	3
or HIST 1160G	or Western Civilization II	
HIST 1120G	United States History II	3
Credits		16

Semester 2

EDUC 3120	Multicultural Education	3
HIST 2250G	East Asia to 1600	3
or HIST 2251G	or East Asia since 1600	
ECON 2120G	Principles of Microeconomics	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Sciences Course ²		4
Credits		16

Third Year

Semester 1

APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
LIBR 311V	Information Literacy	3
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience (Fall Only)	3
GEOG 2130	Map Use and Analysis	3
Area VI: Creative and Fine Arts Course ²		3
Credits		15

Semester 2

BLED 3120	Sheltered English Instruction for the ESL Classroom ¹	3
EDUC 4510	Data Literacy and Assessment (Spring Only) ¹	3
EDUC 4520	Contemporary Issues in Education (Spring Only) ¹	3
HIST 386	New Mexico History	3
EDUC 4996	Topics (Teaching History-spring only)	3
Credits		15

Fourth Year

Semester 1

SUBMIT STEP PACKET		
READ 4330	Content Area Literacy (Fall Only) ¹	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only) ¹	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level ¹	3
300-Level HIST Elective Course		3
300-Level HIST Elective Course		3
Credits		15

Semester 2

EDUC 4820	Secondary Student Teaching ¹	9
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EDUC 4821	Middle and High School Student Teaching Seminar ¹	3
Credits		12
Total Credits		120-121

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

Special Education (Elementary Education) - Bachelor of Science in Education

The undergraduate special education program is an CAEP accredited program designed to prepare teacher candidates for dual licensure in special education and elementary education. The B.S. Special Education (Elementary Education) degree embeds the Language Arts Teaching Field/Concentration and the Bilingual/TESL endorsements. **Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.** Students graduate with the preparation to teach in environments across the continuum of special education services. In addition to special education coursework, students complete an academic teaching field within their major.

All students wishing to complete a degree in Special Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (<https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html>). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students should meet with the College of Education Undergraduate Resource Center to plan appropriate general education courses for a special education major. See "General Requirements" in the "College of Health, Education, and Social Transformation (p. 1075)" section. Students must be admitted to the Teacher Education Program as a condition for enrolling in courses that lead to licensure. Students must pass ENGL, MATH, all education, and teaching field/concentration courses with a C- or better.

Teaching Field: Language Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4

English Composition - Level 2

ENGL 2221G	Writing in the Humanities and Social Science ^{1, 2}	3
or ENGL 2130G	Advanced Composition	

Oral Communication

COMM 1115G	Introduction to Communication ^{2,3}	3
or COMM 1130G	Public Speaking	

Area II: Mathematics

MATH 2134G	Fundamentals of Elementary Math II ¹	3
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Area III/IV: Laboratory Sciences and Social/Behavioral Sciences

CEPY 1120G	Human Growth and Behavior	
Area III: Laboratory Sciences Course (8 credits) ⁴		

Area V: Humanities

HIST 1130G	World History I	3
or HIST 1140G	World History II	

Area VI: Creative and Fine Arts

Choose one from the following courses		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	

General Education Elective

HIST 1110G	United States History I	3
or HIST 1120G	United States History II	

Viewing the Wider World⁵

Departmental/College Requirements

Education Core Requirements

BLED 1110	Introduction n Bilingual Education/ESL ^{1, 6}	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching ¹	3
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society ³	3
SPED 4110	Low Incidence Disabilities in a Diverse Society ³	3

SPED 4811	Practicum in Education, Equity and Cultural Diversity ³	3
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Student Teaching

SPED 4820	Student Teaching SPED ²	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3

Elementary Education Teaching Methods

Block A

BLED 3130	Language, Literacy, and Culture in the ESL Classrooms ^{3,6}	3
EDUC 4310	Methods of Teaching Elementary School Science ³	3
EDUC 4320	Methods of Teaching Elementary School Mathematics ³	3
READ 4310	Elementary School Literacy I ^{2,3}	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society ³	3

Block B

BLED 3120	Sheltered English Instruction for the ESL Classroom ^{3,6}	3
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EDUC 4330	Methods of Teaching Elementary School Social Studies ³	3
BLD 4110	Second Language Acquisition ^{3,6}	3
READ 4320	Elementary School Literacy II ^{2,3}	3
READ 3110	Instruction for Special Reading Needs ^{2,3}	3
<i>Remaining Bilingual/TESOL Courses</i>		
BLD 2110	Bilingual Methods ^{1,6}	3
BLD 3140	Issues in Schooling for Bilingual Learners ⁶	3
LING 2110G	Introduction to the Study of Language and Linguistics (recommended for Language Arts Teaching Field/Bilingual TESOL endorsement) ^{2,6}	3
LING 302V	Language and Society ^{2,6}	3
SPED 3110	Bilingual/Multicultural Special Education ^{3,6}	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
ENGL 363	Literature for Children and Young Adults ²	3
MATH 1134	Fundamentals of Elementary Mathematics I ¹	3
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
or GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
or POLS 1110G	Introduction to Political Science	
Second Language: (not required)		
Electives, to bring the total credits to 129		
Total Credits		129

¹ Courses are pre/co-requisites for Teacher Education Program (TEP)

² Course counts toward the Language Arts Teaching Field

³ Course requires admission to the Teacher Education Program (TEP)

⁴ See the General Education (p. 220) section of the catalog for a full list of courses

⁵ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

⁶ Course counts toward the Bilingual/TESOL endorsement

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1215 Intermediate Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
HIST 1110G	United States History I	3
or HIST 1120G	or United States History II	
Area VI: Creative and Fine Arts Course ²		3
Credits		16

Semester 2		
COMM 1115G	Introduction to Communication	3
MATH 1134	Fundamentals of Elementary Mathematics I ¹	3
HIST 1130G	World History I	3
or HIST 1140G	or World History II	
BLD 1110	Introduction to Bilingual Education/ESL	3
BLD 2110	Bilingual Methods	3
Credits		15

Second Year

Semester 1

ENGL 2221G	Writing in the Humanities and Social Science ¹	3
MATH 2134G	Fundamentals of Elementary Math II ¹	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Science Course ²		4
Credits		16

Semester 2

APPLY TO TEACHER EDUCATION PROGRAM (TEP)

EDLT 3110	Integrating Technology with Teaching	3
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
LING 302V	Language and Society	3
SPED 4110	Low Incidence Disabilities in a Diverse Society (Student must be admitted to TEP to take; usually enroll in during Summer)	3
Area III: Laboratory Sciences Course ²		4
Credits		19

Third Year

Semester 1

BLD 3120	Sheltered English Instruction for the ESL Classroom (Fall Only)	3
EDUC 4330	Methods of Teaching Elementary School Social Studies (Fall Only)	3
BLD 4110	Second Language Acquisition (Fall Only)	3
READ 4320	Elementary School Literacy II (Fall Only)	3
READ 3110	Instruction for Special Reading Needs (Fall Only)	3
SPED 4120	High Incidence Disabilities in a Diverse Society (Fall Only)	3
Credits		18

Semester 2

APPLY TO STUDENT TEACHING

BLD 3130	Language, Literacy, and Culture in the ESL Classrooms (Spring Only)	3
EDUC 4310	Methods of Teaching Elementary School Science	3
EDUC 4320	Methods of Teaching Elementary School Mathematics (Spring Only)	3
READ 4310	Elementary School Literacy I (Spring Only)	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Spring Only)	3
SPED 3110	Bilingual/Multicultural Special Education (Spring Only)	3
Credits		18

Fourth Year**Semester 1**

SUBMIT STEP PACKET		
ENGL 363	Literature for Children and Young Adults	3
BLED 3140	Issues in Schooling for Bilingual Learners (Fall Only)	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
VWW: Viewing a Wider World Course ³		6
Credits		15

Semester 2

SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Credits		12
Total Credits		129

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

³ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.

Special Education (Secondary Education) - Bachelor of Science in Education

The undergraduate special education program is an CAEP accredited program designed to prepare teacher candidates for dual licensure in special education and elementary education. The B.S. Special Education (Secondary Education) degree embeds the Language Arts Teaching Field/Concentration and the Bilingual/TESL endorsements. **Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.** Students graduate with the preparation to teach in environments across the continuum of special education services. In addition to special education coursework, students complete an academic teaching field within their major.

All students wishing to complete a degree in Special Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website. A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students should meet with the College of Education Undergraduate Resource Center to plan appropriate general education courses for a special education major. See "General Requirements" in the "College of Health, Education, and Social Transformation (p. 1075)" section. Students must be admitted to the Teacher Education Program as a condition for enrolling in courses that lead to licensure. Students must pass ENGL, MATH, all education, and teaching field/concentration courses with a C- or better.

Teaching Field: Language Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 132 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		3
<i>Oral Communication</i>		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II Mathematics</i>		
MATH 1220G	College Algebra ^{1, 3}	3
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
<i>Area III: Laboratory Science Course(s) ⁴</i>		8
<i>Area V: Humanities</i>		
HIST 1160G	Western Civilization II	3
<i>Area V: Creative and Fine Arts</i>		
THEA 1110G	Introduction to Theatre (Language Arts Teaching Field/Concentration)	3
<i>General Education Elective</i>		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing the Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses ⁵		
Departmental/College Requirements		
<i>Secondary Education Requirements</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1, 6}	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for TEP admission) ¹	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ²	3
EDUC 4510	Data Literacy and Assessment ²	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level ^{2, 6}	3
READ 4330	Content Area Literacy ²	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ²	3
<i>Student Teaching</i>		
SPED 4820	Student Teaching SPED ²	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3

Special Education Core Requirements

SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society ²	3
SPED 4110	Low Incidence Disabilities in a Diverse Society ²	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) ^{2, 6, 7}	3
READ 3110	Instruction for Special Reading Needs ²	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4440) ^{2, 6, 7}	3

Language Arts Teaching Field/Concentration Requirements

For the teaching field/concentration both (COMM 1130G or COMM 1115G) and (ENGL 2130G or ENGL 2210G) will count towards General Education as well

ENGL 2610 or ENGL 2620	American Literature I American Literature II	3
ENGL 2630 or ENGL 2640	British Literature I British Literature II	3
ENGL 310	Critical Writing	3
ENGL 408 or ENGL 409	Shakespeare I Shakespeare II	3
ENGL 416	Approaches to Literature	3
ENGL 470	Approaches to Composition	3
ENGL 400+ Literature Elective		3
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Choose one from the following courses		3
ENGL 405	Chaucer	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
Choose one from the following courses		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	

Non-Departmental Requirements (in addition Gen.Ed/VWW)

MATH 1430G or MATH 1130G	Applications of Calculus I Survey of Mathematics	3
JOUR 105G	Media and Society	3
One additional Area IV: Social/Behavioral Sciences Course (must be a different subject area than the course selected above) ⁴		3

Second Language: (not required)

Electives, to bring the total credits to 132	0
Total Credits	132

¹ Course prerequisite for the Teacher Education Program (TEP) admission

² Course requires admission to the Teacher Education Program (TEP)

³ MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.

⁴ See the General Education (p. 220) section of the catalog for a full list of courses

⁵ The 9 credits of Upper-Division ENGL courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.

⁶ Course requires field experience

⁷ SPED 4811 requires 90 practicum hours; EDUC 4996 requires 100 practicum hours

Teaching Field: Math

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 131 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
Choose one from the following courses		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
<i>Oral Communication</i>		
Choose one from the following courses		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
<i>Area V: Humanities</i>		
HIST 1150G or HIST 1160G	Western Civilization I Western Civilization II	3
<i>Area VI: Creative and Fine Arts</i>		
Choose one from the following courses		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	

THEA 1110G	Introduction to Theatre	
<i>General Education Elective</i>		
MATH 1521G	Calculus and Analytic Geometry II	4
Viewing the Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses ³		
Departmental/College Requirements		
<i>Secondary Education Core Requirements</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1,4}	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for admission to TEP) ¹	3
BLER 3120	Sheltered English Instruction for the ESL Classroom ⁵	3
EDUC 4510	Data Literacy and Assessment ⁵	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level ^{4,5}	3
READ 4330	Content Area Literacy ⁵	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁵	3
<i>Student Teaching</i>		
SPED 4820	Student Teaching SPED ⁵	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
<i>Special Education Requirements</i>		
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society ⁵	3
SPED 4110	Low Incidence Disabilities in a Diverse Society ⁵	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) ^{4,5,6}	3
READ 3110	Instruction for Special Reading Needs ⁵	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4420) ^{4,5,6}	3
<i>Math Education Teaching Field/Concentration Requirements</i>		
MATH 2530G	Calculus III	3
C S 111	Computer Science Principles	4
E T 182	Introduction to Digital Logic	2
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
STAT 371	Statistics for Engineers and Scientists I	3
or A ST 311	Statistical Applications	
MATH elective numbered 300+		3
MATH elective numbered 300+		3
MATH elective numbered 300+ ⁷		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Choose one from the following:		3

ANTH 1137G	Human Ancestors	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Second Language: (not required)		
Electives, to bring the total credits to 131		0
Total Credits		131

- ¹ Prerequisite for admission to Teacher Preparation Program (TEP)
- ² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
- ³ The 9 credits of Upper-Division MATH courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
- ⁴ Course requires field experience
- ⁵ Course requires admission to Teacher Education Program (TEP)
- ⁶ SPED 4811 requires minimum of 90 practicum hours; EDUC 4996 requires a minimum of 100 practicum hours
- ⁷ If students take a MATH 300+ course instead of a A ST this course will also count as the second VWW requirement. If they take the A ST course they will need to take either an additional MATH course or an additional VWW course.

Teaching Field: Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 130 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
Choose one from the following courses		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science ¹	
<i>Oral Communication</i>		
Choose one from the following courses		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	

ACOM 1130G	Effective Leadership and Communication in Agriculture		SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ⁵	3
Area II: Mathematics			Student Teaching		
MATH 1220G	College Algebra ^{1, 2}	3	SPED 4820	Student Teaching SPED ⁵	9
or MATH 1250G	Trigonometry & Pre-Calculus		SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences			Special Education Core Requirements		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Teaching Field/ Concentration Course(s))	4	SPED 4220	Classroom Management for Diverse Learners	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (Teaching Field/ Concentration Course(s))	4	SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
CEPY 1120G	Human Growth and Behavior	3	SPED 4120	High Incidence Disabilities in a Diverse Society ⁵	3
Area V: Humanities			SPED 4110	Low Incidence Disabilities in a Diverse Society ⁵	3
Choose one from the following courses		3	SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) ^{4,5,6}	3
HIST 1105G	Making History		READ 3110	Instruction for Special Reading Needs ⁵	3
HIST 1110G	United States History I		EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4410) ^{4,5,6}	3
HIST 1120G	United States History II		Science Education Teaching Field/Concentration Requirements		
HIST 1130G	World History I		CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
HIST 1140G	World History II		or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
HIST 1150G	Western Civilization I		CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
HIST 1160G	Western Civilization II		or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
HIST 2245G	Islamic Civilization to 1500		Choose one from the following courses		
HIST 2246G	Islamic Civilizations since 1800		PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
HIST 2250G	East Asia to 1600		PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
HIST 2251G	East Asia since 1600		PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area VI: Creative and Fine Arts			PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		3	Choose one from the following courses		
ARTH 1115G	Orientation in Art		PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
ARTS 1145G	Visual Concepts		PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
DANC 1110G	Dance Appreciation		PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
MUSC 1130G	Music Appreciation: Western Music		PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
MUSC 1110G	Music Appreciation: Jazz		BIOL 301	Principles of Ecology	3
THEA 1110G	Introduction to Theatre		BIOL 305	Principles of Genetics	3
General Education Elective			BIOL 467	Evolution	3
GEOG 1120G	World Regional Geography	3	BIOL 300+	Plant Science Elective	3
or GEOG 1130G	Human Geography		Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Viewing the Wider World			MATH 1430G	Applications of Calculus I	3
LIBR 311V	Information Literacy	3	or MATH 1511G	Calculus and Analytic Geometry I	
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses ³			Choose one from the following:		
Departmental/College Requirements			ANTH 1137G	Human Ancestors	
Secondary Education Core Requirements			ANTH 1140G	Introduction to Cultural Anthropology	
EDUC 1185	Introduction to Secondary Education and Youth ^{1,4}	3	ANTH 1115G	Introduction to Anthropology	
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3	ANTH 1160G	World Archaeology	
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for admission to TEP) ¹	3			
BLER 3120	Sheltered English Instruction for the ESL Classroom ⁵	3			
EDUC 4510	Data Literacy and Assessment ⁵	3			
EDUC 4410	Teaching Science at the Middle and High School Level ^{4,5}	3			
READ 4330	Content Area Literacy ⁵	3			

SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
One additional Area V/VI: Humanities or Creative & Fine Arts Course (must be a different subject area than the course selected above) ⁷		3
Second Language: (not required)		
Electives, to bring the total credits to 130		0
Total Credits		130

¹ Prerequisite for admission to Teacher Preparation Program (TEP)

² MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.

³ The 9 credits of Upper-Division BIOL courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.

⁴ Course requires field experience

⁵ Course requires admission to Teacher Education Program (TEP)

⁶ SPED 4811 requires minimum of 90 practicum hours; EDUC 4996 requires a minimum of 100 practicum hours

Teaching Field: Social Studies

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 135 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I ¹	4
<i>English Composition - Level 2</i>		
ENGL 2221G	Writing in the Humanities and Social Science ¹	3
<i>Oral Communication</i>		
Choose one from the following courses		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		
MATH 1220G	College Algebra ^{1,3}	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
CEPY 1120G	Human Growth and Behavior	3
Area III: Laboratory Sciences Course(s)		8
<i>Area V: Humanities</i>		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
<i>Area VI: Creative and Fine Arts ⁴</i>		3
<i>General Education Elective</i>		
HIST 2250G	East Asia to 1600	3
or HIST 2251G	East Asia since 1600	
Viewing the Wider World		
LIBR 311V	Information Literacy	3

The 2nd VWW requirements will be satisfied with the concentration/teaching field courses ⁵

Departmental/College Requirements		
<i>Secondary Education Core Requirements</i>		
EDUC 1185	Introduction to Secondary Education and Youth ^{1,6}	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for TEP admission) ¹	3
BLED 3120	Sheltered English Instruction for the ESL Classroom ²	3
EDUC 4510	Data Literacy and Assessment ²	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level ²	3
READ 4330	Content Area Literacy ²	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society ²	3
<i>Student Teaching</i>		
SPED 4820	Student Teaching SPED ²	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
<i>Special Education Core Requirements</i>		
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society ²	3
SPED 4110	Low Incidence Disabilities in a Diverse Society ²	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) ^{2,6,7}	3
READ 3110	Instruction for Special Reading Needs ²	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4430) ^{2,6,7}	3
<i>Social Studies Teaching Field/Concentration Requirements</i>		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics	3
GEOG 2130	Map Use and Analysis	3
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
HIST 1110G	United States History I	3
HIST 1120G	United States History II	3
HIST 2245G	Islamic Civilization to 1500	3
or HIST 2246G	Islamic Civilizations since 1800	
HIST 368	Teaching History (See EDUC Teaching History)	3
HIST 386	New Mexico History ⁸	3
HIST Elective 300+		3
HIST Elective 300+		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
GEOG 1120G	World Regional Geography	3
POLS 1120G	American National Government	3
or POLS 1110G	Introduction to Political Science	
Second Language: (not required)		
Electives, to bring the total credits to 135		0
Total Credits		135-136

- ¹ Prerequisite for admission to Teacher Preparation Program (TEP)
- ² Course requires admission to Teacher Education Program (TEP)
- ³ MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.
- ⁴ See the General Education (p. 220) section of the catalog for a full list of courses
- ⁵ The 9 credits of Upper-Division HIST courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
- ⁶ Course requires field experience
- ⁷ SPED 4811 requires minimum of 90 practicum hours; EDUC 4996 requires a minimum of 100 practicum hours
- ⁸ Students who complete HIST 2110 at another campus/university will need to take an additional 3 credit course at the 300+ level in ECON, GEOG, GOVT, or HIST to meet state licensure requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I and the MATH course listed in Semester 1 of the First Year of each Teaching Field roadmap. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Teaching Field: Language Arts

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra ¹	3
or MATH 1250G	or Trigonometry & Pre-Calculus	
JOUR 105G	Media and Society	3
THEA 1110G	Introduction to Theatre	3
Credits		16

Semester 2

COMM 1115G	Introduction to Communication	3
MATH 1130G	Survey of Mathematics ¹	3
or MATH 1430G	or Applications of Calculus I	
HIST 1160G	Western Civilization II	3
EDUC 1185	Introduction to Secondary Education and Youth	3
ENGL 2610	American Literature I	3
or ENGL 2620	or American Literature II	
Credits		15

Second Year

Semester 1		Credits
ENGL 2210G	Professional & Technical Communication ¹	3
HIST 1110G	United States History I	3
or HIST 1120G	or United States History II	
ENGL 2630	British Literature I	3
or ENGL 2640	or British Literature II	
SPED 3105	Introduction to Special Education in a Diverse Society	3
LIBR 311V	Information Literacy	3
Area III: Laboratory Science Course ¹		4
Credits		19

Semester 2

EDLT 3110	Integrating Technology with Teaching	3
ENGL 310	Critical Writing	3
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
SPED 4220	Classroom Management for Diverse Learners	3
BLER 3120	Sheltered English Instruction for the ESL Classroom	3
Area III: Laboratory Science Course ¹		4
Credits		19

Third Year

Semester 1

READ 3110	Instruction for Special Reading Needs	3
ENGL 408	Shakespeare I (Fall Only)	3
or ENGL 409	or Shakespeare II	
SPED 4120	High Incidence Disabilities in a Diverse Society (Fall Only)	3
ENGL 470	Approaches to Composition (Fall Only)	3
400-Level ENGL Literature Elective Course		3
One additional Area IV: Social/Behavioral Science Course ¹		3
Credits		18

Semester 2

EDUC 4510	Data Literacy and Assessment	3
EDUC 4996	Topics	3
ENGL 416	Approaches to Literature (Spring Only)	3
SPED 4110	Low Incidence Disabilities in a Diverse Society (Spring Only)	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners (Spring Only)	3
Credits		15

Fourth Year

Semester 1

READ 4330	Content Area Literacy (Fall Only)	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level (Fall Only)	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only)	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
Choose one from the following:		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
400-Level ENGL Literature Elective Course ²		3
Credits		18

Semester 2

SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Credits		12
Total Credits		132

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² 400 - level elective courses:

- ENGL 405 Chaucer
- ENGL 442 Modern and Contemporary American Poetry
- ENGL 458 Latino/a Literature and Culture
- ENGL 469 Advanced Study in American Literature
- ENGL 481 Women's Literature

Teaching Field: Math

First Year

Semester 1		Credits
ENGL 1110G	Composition I	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1511G	Calculus and Analytic Geometry I	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
Credits		17

Semester 2

COMM 1115G	Introduction to Communication	3
HIST 1110G	United States History I	3
or HIST 1120G	or United States History II	
MATH 1521G	Calculus and Analytic Geometry II	4
EDUC 1185	Introduction to Secondary Education and Youth	3
C S 111	Computer Science Principles	4
Credits		17

Second Year

Semester 1

ENGL 2221G	Writing in the Humanities and Social Science	3
E T 182	Introduction to Digital Logic	2
SPED 3105	Introduction to Special Education in a Diverse Society	3
Choose from one of the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: ANTH, GEOG, POLS or SOCI "G" Course		3
Credits		15

Semester 2

EDLT 3110	Integrating Technology with Teaching	3
MATH 1531	Introduction to Higher Mathematics	3
SPED 4220	Classroom Management for Diverse Learners	3
LIBR 311V	Information Literacy	3
Choose from one of the following:		4
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Credits		16

Third Year

Semester 1

READ 3110	Instruction for Special Reading Needs	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
SPED 4120	High Incidence Disabilities in a Diverse Society	3
STAT 371 or A ST 311	Statistics for Engineers and Scientists I or Statistical Applications	3
300-Level MATH Elective Course		3
Credits		18

Semester 2

BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4510	Data Literacy and Assessment	3
EDUC 4996	Topics	3
SPED 4110	Low Incidence Disabilities in a Diverse Society	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
300-Level MATH Elective Course		3
Credits		18

Fourth Year

Semester 1

READ 4330	Content Area Literacy	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
HIST 1150G or HIST 1160G	Western Civilization I or Western Civilization II	3
300-Level MATH Elective Course		3
Credits		18

Semester 2

SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Credits		12
Total Credits		131

Teaching Field: Science

First Year

Semester 1		Credits
ENGL 1110G	Composition I	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G or MATH 1250G	College Algebra or Trigonometry & Pre-Calculus	3-4
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
Area V: Any HIST "G" Course		3
Credits		16-17

Semester 2

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
COMM 1115G	Introduction to Communication	3
MATH 1430G or MATH 1511G	Applications of Calculus I or Calculus and Analytic Geometry I	3-4
EDUC 1185	Introduction to Secondary Education and Youth	3
CHEM 1215G or CHEM 1226	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
Credits		17-18

Second Year**Semester 1**

ENGL 2221G	Writing in the Humanities and Social Science	3
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
SPED 3105	Introduction to Special Education in a Diverse Society	3
LIBR 311V	Information Literacy	3
Area IV: ANTH or SOCI "G" Course		3
Credits		20

Semester 2

EDLT 3110	Integrating Technology with Teaching	3
Choose from one of the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230L & 2230L	Laboratory to General Physics for Life Science I and Laboratory to General Physics for Life Science I	
BIOL 301	Principles of Ecology	3
SPED 4220	Classroom Management for Diverse Learners	3
READ 3110	Instruction for Special Reading Needs	3
Credits		16

Third Year**Semester 1**

BIOL 305	Principles of Genetics	3
SPED 4120	High Incidence Disabilities in a Diverse Society	3
BIOL 467	Evolution	3
Choose from one of the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	

PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
GEOG 1120G or GEOG 1130G	World Regional Geography or Human Geography	3
Credits		16

Semester 2

BLER 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4510	Data Literacy and Assessment	3
EDUC 4996	Topics	3
SPED 4110	Low Incidence Disabilities in a Diverse Society	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
One additional Area V/VI: Humanites or Creative and Fine Arts Course		3
Credits		18

Fourth Year**Semester 1**

READ 4330	Content Area Literacy	3
EDUC 4410	Teaching Science at the Middle and High School Level	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
300-Level BIOL Plant Science Elective Course		3-4
Credits		15-16

Semester 2

SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Credits		12
Total Credits		130-133

Teaching Field: Social Studies

First Year

Semester 1		Credits
ENGL 1110G	Composition I ¹	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G or MATH 1250G	College Algebra ¹ or Trigonometry & Pre-Calculus	3-4
HIST 1110G	United States History I	3
Area VI: Creative and Fine Arts Course ²		3
Credits		16-17

Semester 2

COMM 1115G	Introduction to Communication	3
HIST 1130G or HIST 1140G	World History I or World History II	3
ECON 2120G or ECON 2110G	Principles of Microeconomics or Macroeconomic Principles	3
EDUC 1185	Introduction to Secondary Education and Youth	3
Area III: Laboratory Science Course ²		4
Credits		16

Second Year**Semester 1**

ENGL 2221G	Writing in the Humanities and Social Science ¹	3
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POLS 1110G or POLS 1120G	Introduction to Political Science or American National Government	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
HIST 1150G or HIST 1160G	Western Civilization I or Western Civilization II	3
LIBR 311V	Information Literacy	3
ECON 2110G or ECON 2120G	Macroeconomic Principles or Principles of Microeconomics	3
Credits		18

Semester 2

EDLT 3110	Integrating Technology with Teaching	3
HIST 2245G or HIST 2246G	Islamic Civilization to 1500 or Islamic Civilizations since 1800	3
SPED 4220	Classroom Management for Diverse Learners	3
HIST 368	Teaching History (See EDUC Teaching History)	3
GEOG 1120G	World Regional Geography	3
HIST 1120G	United States History II	3
Credits		18

Third Year**Semester 1**

READ 3110	Instruction for Special Reading Needs	3
SPED 4120	High Incidence Disabilities in a Diverse Society	3
GEOG 2130	Map Use and Analysis	3
MATH 1130G or MATH 1430G	Survey of Mathematics ¹ or Applications of Calculus I	3
EDUC 4996	Topics	3
300-Level HIST Elective Course		3
Credits		18

Semester 2

BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4510	Data Literacy and Assessment	3
SPED 4110	Low Incidence Disabilities in a Diverse Society	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
HIST 2250G or HIST 2251G	East Asia to 1600 or East Asia since 1600	3
300-Level HIST Elective Course		3
Credits		18

Fourth Year**Semester 1**

READ 4330	Content Area Literacy	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
HIST 386	New Mexico History	3
Area III: Laboratory Science Course ²		4
Credits		19

Semester 2

SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Credits		12
Total Credits		135-136

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² See the General Education (p. 220) section of the catalog for a full list of courses.

Africana Studies - Undergraduate Minor

Prefix	Title	Credits
Required Core Courses		
AFST 1110G	Introduction to Africana Studies	3
AFST 2110G	African American History	3
AFST 2140G	Black Women in the African Diaspora	3
Electives		
Choose 9 credits from the following:		9
EDUC 3996	Special Topics in Education (Africana Studies)	
HIST 361	African American History to 1877	
HIST 362	African American History, 1865-present	
EDUC 3110V	Multicultural Issues in Society	
EDUC 3120	Multicultural Education	
Total Credits		18

Semester 1		Credits
AFST 1110G	Introduction to Africana Studies	3
Credits		3
Semester 2		
AFST 2110G	African American History	3
Credits		3
Semester 3		
AFST 2140G	Black Women in the African Diaspora	3
Credits		3
Semester 4		
Three Elective Courses (300 or above) ¹		9
Credits		9
Total Credits		18

¹ See the Requirements tab for a list of elective courses.

Early Childhood Education - Undergraduate Minor

The primary function of the undergraduate programs in the Department of Curriculum and Instruction is the preparation of licensed teachers for early-childhood settings and elementary and secondary schools. This process includes a broad general education, professional education and teaching specializations.

Prefix	Title	Credits
Early Childhood Education Minor		
Select a minimum of 9 credits in lower division courses		9
ECED 1110	Child Growth, Development, and Learning	
ECED 1115	Health, Safety, and Nutrition	
ECED 1130	Family and Community Collaboration	

ECED 2115	Introduction to Language, Literacy, and Reading	
ECED 2110	Professionalism	
ECED 1125	Assessment of Children and Evaluation of Programs	
ECED 1120	Guiding Young Children	
FCST 2110	Infancy Through Middle Childhood in the Family	
CEPY 2120	The Preschool Child	
<i>Select a minimum of 9 credits in upper division courses</i>		9
ECED 3210	Emergent Literacy	
ECED 4220	Advanced Caregiving for Infants and Toddlers	
SPED 3105	Introduction to Special Education in a Diverse Society	
ECED 4110	Young Children with Diverse Abilities	
ECED 4120	Assessment of Young Children, Birth-Eight	
EDUC 3120	Multicultural Education	
FCST 383	Parenting and Child Guidance	
CAST 301V	Introduction to Child Advocacy	
SOCI 3250	Sociology of Childhood	
Total Credits		18

Educational Leadership and Administration - Undergraduate Minor

A minor in educational leadership and administration is available to a student receiving a bachelor's degree from another department in the university. The minor in educational leadership and administration is designed to be useful to the undergraduate who is preparing to work as a teacher or staff member in educational organizations such as primary schools, community colleges and universities.

Prefix	Title	Credits
Required Courses		
ELAD 2340	Multicultural Leadership in Education	3
ELAD 2210	Leadership and Change in Education	3
ELAD 3210	Current Issues In Educational Leadership	3
ELAD 3996	Special Topics in Education	3
ELAD 4120	Principles of Education Law and Policy	3
ELAD 4130	Principles of Education Budgeting and Finance	3
Total Credits		18

How To Apply

If you wish to complete a minor in Educational Leadership and Administration (ELA), you should complete the ELA minor application/verification form and return it to the School of Teacher Preparation, Administration, and Leadership (TPAL) during the semester in which you will be completing your ELA minor coursework. This form notifies the registrar of your intention. It insures that if you complete the requirements for the minor, it will be officially recorded in your transcript.

Secondary Education - Undergraduate Minor

Students not earning a bachelor's degree in Secondary Education could be eligible for a minor in Secondary Education. Students must have a degree area related to one of the secondary licensure options of English

Language Arts, Social Studies, Mathematics, or Science. Students must complete all 27 credits from the courses listed below with grades of C- or higher. All 27 credits are considered upper division. Students must complete a Teacher Education Program (TEP) online portfolio in order to be accepted into TEP. The TEP prerequisite courses include EDUC 3120 Multicultural Education, SPED 3105 Introduction to Special Education in a Diverse Society, and EDUC 3997 Secondary Field Experience. For completion of the minor, students must pass the approved state licensure exams and must complete a full semester of student teaching. Students interested in the Minor in Secondary Education must contact the program director to determine eligibility.

Prefix	Title	Credits
Pre-TEP Courses		
EDUC 3120	Multicultural Education ¹	3
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
EDUC 3997	Secondary Field Experience ^{1, 2}	3
TEP Required Courses		
EDUC 4820	Secondary Student Teaching ⁴	9
EDUC 4821	Middle and High School Student Teaching Seminar ⁴	3
READ 4330	Content Area Literacy ³	3
<i>Content Area Teaching Methods Course</i>		3
EDUC 4410	Teaching Science at the Middle and High School Level ^{2, 3}	
EDUC 4420	Teaching Mathematics at the Middle and High School Level ^{2, 3}	
EDUC 4430	Teaching Social Studies at the Middle and High School Level ^{2, 3}	
EDUC 4440	Teaching Language Arts at the Middle and High School Level ^{2, 3}	
Total Credits		27

¹ TEP prerequisites/co-requisites

² Courses require field experience

³ Courses require admission to TEP

⁴ Must have applied for Student Teaching

This roadmap suggests that a student starts their Minor as early as the first semester of Sophomore year. If a student starts later, then more than one course may be taken during a semester following the same order of courses.

Semester 1		Credits
EDUC 3120	Multicultural Education ¹	3
Credits		3
Semester 2		
SPED 3105	Introduction to Special Education in a Diverse Society ¹	3
Credits		3
Semester 3		
Apply to TEP		
EDUC 3997	Secondary Field Experience ^{1, 2}	3
Credits		3
Semester 4		
READ 4330	Content Area Literacy ³	3
Credits		3
Semester 5		
Submit STEP packet ⁴		

Content Area Methods Course		3
EDUC 4410	Teaching Science at the Middle and High School Level ^{2,3}	
EDUC 4420	Teaching Mathematics at the Middle and High School Level ^{2,3}	
EDUC 4430	Teaching Social Studies at the Middle and High School Level ^{2,3}	
EDUC 4440	Teaching Language Arts at the Middle and High School Level ^{2,3}	
Credits		3
Semester 6		
Student Teaching Semester ⁵		
EDUC 4820	Secondary Student Teaching ³	9
EDUC 4821	Middle and High School Student Teaching Seminar (must be taken concurrently with EDUC 4820) ³	3
Credits		12
Total Credits		27

¹ Courses are prerequisites/co-requisites for the Teacher Education Program (TEP)

² Courses require Field Experience

³ Courses require admission to TEP

⁴ Must submit STEP Packet to be considered for student teaching

⁵ Must be last semester before graduation unless major degree program requires a Senior project to be completed in last semester.

Social Work

Undergraduate Program Information

The BSW degree (CSWE accredited) allows you to join a profession dedicated to helping people in personal and social situations. As a unique and challenging field, social work addresses the complexity of human behavior and the ever-present needs and potential of people. From rural communities to inner cities, social workers work in social service agencies, mental health centers, hospitals, schools, neighborhood organizations, probation offices, and private agencies. Social work roles are varied and flexible. Social workers practice in areas such as child abuse, community organization, direct services with individuals and families, mental health, group work, and the administration, planning, and development of social programs. With each consumer group and in every agency setting, social workers help to correct the causes or alleviate the results of poverty, racism, poor health, mental illness, or any condition that prohibits people from reaching their potential.

Graduate Program Information

The School of Social Work offers full-time and part-time graduate study in Las Cruces and Online leading to the Master of Social Work (MSW) degree. The program is designed to provide academic and practicum education with an emphasis in Advanced Generalist Practice with Populations of the Southwest based on the foundation first year of generalist practice. The program is fully accredited by the Council on Social Work Education (CSWE).

Admission to the program is in accordance with the general regulations of the Graduate School, which include a completed undergraduate degree from an accredited institution. In addition to applying to the Graduate School, the application must also be made to the School of Social Work. The application to the School of Social Work spells out admission requirements, including submitting an internal application, a written

statement, a current resume, and personal references. Applicants having a degree from a non-liberal arts area must show coursework that includes two courses from the humanities, two from the natural and biological sciences (with one course containing content in human biology) and three from the behavioral and social sciences, with at least one course in sociology or psychology. Applicants are also required to complete a Basic Statistics course before beginning their MSW program of study. The program does not grant academic credit for work or other life experience in lieu of social work courses or practicum education.

The School of Social Work is committed to ensuring a culturally diverse student population to enhance the social work profession at both state and national levels. To meet this goal of diversity, the school makes an effort to recruit from historically underrepresented groups.

Applicants who qualify for advanced standing may complete the program with 30 credits rather than 60 credits. Admission to the advanced-standing program is for highly qualified applicants who have a Bachelor of Social Work degree (BSW) from a social work program accredited by the CSWE and earned within five years of beginning the advanced standing program, a cumulative GPA of at least 3.0 and a minimum GPA of 3.5 in core Undergraduate Social Work courses.

Degrees for the Department

Bachelor Degree(s)

- Social Work - Bachelor of Social Work (p. 1308)
- Social Work - Bachelor of Social Work (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/social-work-bsw-online/>)

Master Degree(s)

- Master of Public Health/Master of Social Work - Dual Degree (<http://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/>)
- Social Work - Master of Social Work (p. 163)
- Social Work - Master of Social Work (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/social-work-msw-online/>)

Director: Héctor Luis Díaz, PhD

Associate Professor de la Rosa, Finno-Velasquez, Gherardi **Assistant Professor** Gergerich, Lopez, Knox **College Assistant Professors** Garcia, Montoya, Nelson, Pearson, Tellez **College Associate Professor** Parker

I. de la Rosa, PhD (Michigan)-program evaluation, research; **M. Finno-Velasquez**, PhD (California)-child welfare, immigration; **S. Gherardi**, PhD (Illinois)-school social work; **E. Gergerich**, PhD (Arkansas)-gerontology; **A. Lopez**, PhD (Massachusetts, Mexico)-Latino immigrant families and children; **K. Knox**, PhD (New Mexico)- special education; **M. Garcia**, MSW (New York)-culturally relevant and anti-oppressive practice; **M. Montoya**, MSW (New Mexico)-child welfare; **A. Nelson**, PhD (New Mexico)-anti-oppression trauma informed behavioral health; **V. Trujillo-Pearson**, MSW (New Mexico)- behavioral health services; **M. Tellez**, MSW (New Mexico)- serious mental illness, criminal justice system; **J. Parker**, MSW (Colorado)- sociology, criminal justice.

Please see faculty page for full faculty bios: <https://socialwork.nmsu.edu/staff-resources1/directory1.html>

Social Work Courses

SOWK 2110G. Introduction to Human Services & Social Work

3 Credits (3)

This course is for students who are interested in social welfare issues and/or are considering entering a social service profession. The course presents an overview of social problems, issues and trends, and the network of social agencies developed to address these concerns. The course examines the influence of personal and professional values and ethics on the helping relationship. The concept of social welfare will be discussed from a social work perspective (with an emphasis on social justice), and students will gain a basic understanding of social work in U.S. society, social work career opportunities, and contemporary issues facing social workers. Approaches relevant to work with individuals, families, groups and communities are presented, with special emphasis on Hispanic and Indigenous populations of New Mexico and the Southwest. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the interactions of social institutions, cultural factors, dimensions of identity, and environment with the human development and behavior of individuals.
2. Demonstrate knowledge of the social work profession's focus on addressing contemporary social issues in the United States.
3. Describe the mission and services provided by social service agencies at the regional, national, and global levels.
4. Demonstrate a basic understanding of the social work profession, its history, career opportunities, and contemporary issues facing social workers in the United States today.
5. Recognize how students' knowledge, skills, and attitudes impact their competence as helping professionals.

SOWK 2111. Women's Issues in Social Work

3 Credits (3)

Examines gender-specific social problems and their identification and resolution through the use of social agencies and community resources. Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the commonalities among all women, identifying commonalities and differences among oppressed and dominant groups, recognize multiple oppressions, and respect diversity while conducting social work practice through readings, class discussions, and/or written assignments.
2. Identify the various needs of women as individuals, family members and community members through readings, class discussions, and/or written assignments.
3. Demonstrate skills in working effectively with diverse issues involving women with an emphasis on building strengths, interdependence, self-direction, shared power, and cooperation through experiential exercises, written assignments, companion book, and instructor presentations.
4. Demonstrate skills in addressing issues that affect women such as parental issues, relationship problems, physical abuse, sexual abuse, crime, substance abuse, eating disorders, housing concerns, psychological issues and physical abilities written reports.
5. Understand the importance of and demonstrating skills in caring and empathetic connection in the change process through written assignments, experiential activities in the companion book.
6. Understanding the Importance of the Professionals Self-Care through experiential activities and journaling in the companion book.

SOWK 3110. Sociocultural Concepts

3 Credits (3)

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are examined. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the role culture, gender, sexual orientation, and socioeconomic class play in the way people think, feel, and behave.
2. Examine how diverse populations have been oppressed and exploited by dominant groups throughout U.S. history.
3. Analyze the effects of stereotypes, fallacies, and misconceptions about groups that experience oppression such as the LGBTQIA2S + community, the Elderly, People with Disabilities, BIPOC and people from low socio economic backgrounds and other socially marginalized groups.
4. Recognize theoretical models that describe various forms of discrimination, oppression, privilege and power.
5. Be familiar with relevant knowledge regarding the Southwest, border issues, Native American and Latinx/Chicanx/Hispanic content.
6. Recognize and implement anti racist, anti oppressive, and practice decolonization/indigenization and cultural humility in social work practice and social justice.

SOWK 3120. Human Behavior and the Social Environment I

3 Credits (3)

Major theories of human behavior and the life span from conception to adolescence. May be repeated up to 3 credits.

Learning Outcomes

1. Apply knowledge of and be able to critique the major theories of human behavior and development processes in the social environment.
2. Introduce knowledge and understanding of the influence of environmental systems (groups and communities) and the complex interplay of biological, psychological, social, spiritual, and cultural dimensions for human development and functioning across the life span.
3. Explore and discuss knowledge and appreciation for human diversity (race/ethnicity, culture, gender, physical/mental disabilities, rural/urban differences, sexual orientation and socioeconomic status) and their impact on human development and functioning.
4. Identify and analyze factors and/events that affect ethnic minorities, women, and other vulnerable and/or oppressed populations.
5. Become familiar with current research of human behavior and the social environment as well as principal based ethics and social work values involved.
6. Examine and explore awareness of the ethical dilemmas, controversies and values inherent in work with diverse populations and various social systems and the implications for practice with emphasis on the Southwest.
7. Explore biases and stereotypes that can affect the understanding of human behavior and change in the social environment

SOWK 3130. Human Behavior and the Social Environment II

3 Credits (3)

Continuation of S WK 3120. Major theories of human behavior and the life span from young adulthood through old age. Restricted to: S WK majors. May be repeated up to 3 credits.

Prerequisite: SOWK 3120.

SOWK 3140V. Introduction to Social Policy: History**3 Credits (3)**

Historical overview of the economic, political, and cultural impact on social welfare policy, institutions, and professions with international content. May be repeated up to 3 credits.

Learning Outcomes

1. Students will use reflection and self-regulation to manage personal values as they engage in discussion and written reflection around underlying values in social welfare.
2. Students will apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the macro level through written reflection.
3. Students will apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies through self-reflective discussions.
4. Students will apply their understanding of social, economic, and environmental justice to analyze social policy and advocate for just policies.
5. Through policy analysis and review of policy research, students will identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services; assess how social welfare and economic policies impact the delivery of and access to social services, and apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice.

SOWK 3150. Social Work Research**3 Credits (3)**

This undergraduate course is designed to prepare students to be effective consumers of research and to evaluate their own practice. Students will learn to read, critically evaluate and use the research of others to select interventions that are based on evidence of effectiveness. Students will demonstrate the knowledge, values and skills to be critical consumers of research for effective and ethical practice as well as possess the basic skills necessary to evaluate their own social work professional practice. Restricted to Social Work majors. May be repeated up to 3 credits.

Prerequisite: MATH 1350G or STAT 2350G.

SOWK 3210. Social Work Practice Skills**3 Credits (3)**

Introduction to generalist social work practice. Interpersonal skills, values, and ethics required in the helping relationship. Taught in a small-group format. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate and apply knowledge and skills of entry-level generalist social work practice which focus on the interaction between client-systems and the social environment.
2. Demonstrate and apply the integration of social work values and ethics with one's own personal values and apply ethical decision making in practice.
3. Demonstrate and apply worker-client relationship building and maintenance skills which can be applied across client-systems and populations.
4. Demonstrate and apply knowledge and skills of entry-level generalist social work practice with populations that are targeted and most vulnerable
5. Demonstrate and apply knowledge and skills of entry-level generalist social work practice with populations-at-risk including skills for engagement, assessment, intervention, and evaluation.
6. Demonstrate and apply both critical thinking and evidence-based practice skills in entry-level generalist social work practice.
7. Identify and apply methods of evaluating effectiveness in practice skills, assessment, and intervention across client systems.

SOWK 3220. Social Work Practice with Individuals**3 Credits (3)**

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with individual client systems. Restricted to: S WK majors. May be repeated up to 3 credits.

Prerequisite: SOWK 3210.

SOWK 3230. Social Work Practice with Families**3 Credits (3)**

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with multicultural family systems. May be repeated up to 3 credits.

Prerequisite: SOWK 3210.

Learning Outcomes

1. Students will apply ethical principles in social work and frameworks for ethical decision making to case scenarios involving families.
2. Students will assess their family of origin and its potential impact on their own work with families.
3. Students will model stages of the helping process with diverse families using cultural humility and a transcultural perspective.
4. Students will explain how family identity intersects with social factors to impact family functioning.
5. Students will plan and execute role plays modeling engagement with diverse families that reflect transcultural awareness and cultural humility.
6. Students will integrate discussion of their own experiences in their planning for family engagement.
7. Students will plan and execute role plays modeling assessment with diverse families that reflect transcultural awareness and cultural humility.
8. Students will conduct a family biopsychosocial assessment and treatment plan. Students will conduct a family biopsychosocial assessment and treatment plan. Students will plan and execute role plays modeling practice evaluation.

SOWK 4110. Social Welfare Policy: Legislation**3 Credits (3)**

Policy practice related to the formation of current social welfare policies that promote social and economic justice. Emphasis is on the development and influences of social policy, policy analysis, and the policy change process. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the social policy development and influence process.
2. Apply a framework for the analysis of current and proposed social policy.
3. Identify and discuss current legislation which addresses social and economic justice.
4. Articulate gaps and/or problems in existing social welfare policies and in social welfare programs.
5. Identify strategies which are appropriate to baccalaureate level practice that may influence policymakers on behalf of people in need.

SOWK 4210. Generalist Social Work Practice with Organizations and Communities**3 Credits (3)**

This course focuses on generalist social work values, knowledge and skills regarding practice with larger systems. Course content will include theories of community and organizational assessment and intervention. Strategies for advocacy and change, leadership for community and organizational change. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze various macro theories and apply two or more to a particular issue within a local community or organization.
2. Describe the historical context/foundation of macro practice in social work and identify its application in the community.
3. Identify ethical principles related to macro practice.
4. Describe the use of macro level practice in empowering diverse and oppressed populations
5. Describe an evidence-based practice framework for social work intervention with communities and organizations.

SOWK 4220. Generalist Social Work Practice with Groups**3 Credits (3)**

Generalist social work practice skills with group client systems focusing on the planned change process and the empowerment of oppressed populations. Restricted to: S WK majors. May be repeated up to 3 credits.

SOWK 4230. Family and Child Welfare Practice**3 Credits (3)**

Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning. May be repeated up to 3 credits.

SOWK 4240. Professionalism in the Field of Social Work**3 Credits (3)**

Students will use the field experience as the backdrop for assessing their own progress toward entry level generalist social work practice; to integrate coursework and field experience to develop their professional foundation. Restricted to: S WK majors. May be repeated up to 3 credits.

Corequisite: SOWK 4321.

SOWK 4310. Practicum I**3 Credits (3)**

Supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.

Corequisite: SOWK 4311.

SOWK 4311. Practicum Seminar I**3 Credits (3)**

The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to develop social work competencies. Restricted to: S WK majors.

Corequisite: SOWK 4310.

SOWK 4320. Practicum II**3 Credits (3)**

This course is a continuation of a supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.

Corequisite: SOWK 4321.

SOWK 4321. Practicum Seminar II**3 Credits (3)**

The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to demonstrate social work competencies. Restricted to: S WK majors. May be repeated up to 3 credits.

Corequisite: SOWK 4320.

SOWK 4510. Family and Child Welfare Policy**3 Credits (3)**

This course is designed to provide students with an understanding of the history and evolution of child welfare policies, initiatives and factors that influence advocacy and practices within the child welfare system. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

SOWK 4996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Junior or above standing, majors or consent of instructor. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

SOWK 4997. Independent Study**1-6 Credits (1-6)**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOWK 5110. Sociocultural Concepts and Populations of the Southwest**3 Credits (3)**

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are emphasized. May be repeated up to 3 credits.

Learning Outcomes

1. Explain and compare various theoretical and historical perspectives on discrimination, oppression and economic deprivation, as well as theories of human need and social justice as they relate to marginalized populations in the U.S., especially within the U.S. Southwest.
2. Describe the forms and mechanisms of oppression and discrimination, including the extent to which a culture's structures and values, including social, economic, political, and cultural exclusions, may oppress, marginalize, alienate, or create privilege and power.
3. Analyze the impact of discrimination, oppression and disenfranchisement as well as privilege, power, and acclaim on the human experience and formation of identity.
4. Evaluate dimensions of diversity as the intersectionality of multiple factors including but not limited to age, class, color, culture, disability and ability, ethnicity, gender, gender identity and expression, immigration status, marital status, political ideology, race, religion/spirituality, sex, sexual orientation, and tribal sovereign status.
5. Propose strategies designed to eliminate oppressive structural barriers to ensure that social goods, rights, and responsibilities are distributed equitably and that civil, political, environmental, economic, social, and cultural human rights are protected.

SOWK 5120. Social Work Research I**3 Credits (3)**

Introduction to analytical skills used in social work research: problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human participants in research, and application of research knowledge and professional ethics to social work practice. Restricted to: MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the application of research methodologies for conducting both qualitative and quantitative empirical studies.
2. Students will select relevant peer-reviewed journal articles representative of the generalist social work practice model that contribute to their understanding of social work as an evidenced-based practice.
3. Students will analyze the roles that the Belmont Report, Health and Human Services Office for Human Research Protections, and Institutional Review Boards have in the ethical treatment and protection of human subject participants in conducting research.
4. Students will integrate the professional standards of CSWE Competency 4 into the implications section of the article critiques and research proposal assignment.
5. Students will connect their field practicum experiences to identify the role of generalizable results from empirical research applying to their area of practice client population.
6. Students will propose an empirical research study that details the steps necessary to apply for Institutional Review Board approval.

SOWK 5130. Human Behavior and the Social Environment I**3 Credits (3)**

The major theories of human behavior and the life span from conception to adolescence. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Restricted to MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Describe key theories of human behavior in the social environment.
2. Compare stage theories to recognize typical human development
3. Apply theoretical perspectives to explain a range of various human behaviors.
4. Identify key biological, psychological, and spiritual characteristics of a client (and) subsequently apply appropriate intervention strategies.
5. Identify ways one's physical environment may promote and/or deter optimal health/well-being.

SOWK 5140. Human Behavior & the Social Environment II**3 Credits (3)**

The major theories of human behavior from young adulthood to old age. This course will focus on both areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Restricted to: MSW majors.

Prerequisite: SOWK 5130.

Learning Outcomes

1. Describe the biological and psychological elements and impacts of adverse childhood experiences and trauma.
2. Identify typical physical, cognitive, and socioemotional development of infants, children, adolescents, adults and older adults (as well as atypical developmental issues for each age/stage).
3. Recognize the sociocultural context of childbearing, child rearing, adolescence, partnership, and aging.
4. Apply knowledge of human development to guide social work assessment and intervention.

SOWK 5150. Social Problems and Social Welfare Policy**3 Credits (3)**

An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to change policies that impact vulnerable populations. May be repeated up to 3 credits.

Learning Outcomes

1. Summarize the history of the social work profession in social welfare policy and the major roles that social workers perform in policy practice.
2. Analyze the values, institutional, political and economic forces that drive social problems and social welfare policy in the U.S.
3. Analyze past, current and future social policies developed to respond to social problems from a lens that considers the historical, social, cultural, economic, organizational, environmental, and global influences on social problems, and the impact on diverse populations of the Southwest.
4. Evaluate how social work values, ethics, and research, impact the development, evaluation, and implementation of social policy.

SOWK 5160. Generalist Social Work Practice I**3 Credits (3)**

This is the first course of a two-course sequence. An introduction to the generalist crosscultural, social work practice perspective with individuals and families, focusing on social work as a profession, social work knowledge base, professional development, relationship building and assessment with individuals and families within a framework of social work values and ethics. Restricted to: MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will apply the NASW Code of Ethics and frameworks for ethical reasoning to ethical dilemmas encountered in social work practice
2. Students will analyze the strengths and limitations of social work at the micro, mezzo, and macro levels.
3. Students will demonstrate client engagement through the process of motivational interviewing
4. Students will apply skills for effective client assessment through interviews and written biopsychosocial-spiritual assessments
5. Students will create effective, measurable client-centered goals and objectives
6. Students will engage in interprofessional collaboration around a current topic
7. Students will apply knowledge of theory and their own positionality to assessment information to formulate a case

SOWK 5170. Generalist Social Work Practice II**3 Credits (3)**

This is the second course of a two-course sequence. A continuation of the generalist crosscultural, social work practice perspective with individuals and families, focusing on goal setting, contracting, implementation, and outcome assessment. The course also applies the generalist practice perspective and methods to larger systems: groups, organizations, and communities and includes relationship building, assessment, goal setting, contracting, implementation and outcome assessment within a framework of social work values and ethics. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5160.

Learning Outcomes

1. Students will analyze strategies for integrating micro, mezzo, and macro approaches to meet client needs
2. Students will select relevant, evidence-based interventions to meet client goals
3. Students will monitor progress and evaluate treatment outcomes using effective measurement tools and strategies
4. Students will demonstrate foundational skills for engagement and intervention with groups and/or families
5. Students will describe the rationale and basic skills for intervention with communities and organizations.
6. Students will propose a project that applies the planned change process at the community level
7. Students will integrate their learning across all nine social work competencies and apply this learning to a given case.

SOWK 5180. Generalist Practicum Experience I**3 Credits (3)**

Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Restricted to: MSW majors.

SOWK 5190. Generalist Practicum Experience II**3 Credits (3)**

Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Restricted to: MSW majors.

Prerequisite: SOWK 5180.

SOWK 5220. Social Work Research II**3 Credits (3)**

Focused on advanced generalist practice research in multicultural settings. Advanced skills to evaluate practice with individuals, families, groups, organizations, and communities in multicultural settings. Needs assessment as well as program and practice evaluation are emphasized. Restricted to: MSW majors.

Prerequisite: SOWK 5120.

Learning Outcomes

1. Demonstrate understanding of qualitative and quantitative analysis methods used in advanced generalist social work practice.
2. Apply qualitative and quantitative analytical methods to evaluate the effectiveness of advanced generalist social work practice, for a. advanced generalist program evaluation, b. advanced generalist needs assessment, and c. evaluation of one's own practice.
3. Develop competencies in critical analysis of empirical literature related to advanced generalist social work practice.
4. Demonstrate sensitivity to ethical, value, and cultural issues in the application of social work research methods.

SOWK 5250. Policy Analysis and Change**3 Credits (3)**

This course will emphasize policy practice focusing on policy analysis and creating and implementing policy change. Restricted to MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5150.

Learning Outcomes

1. Analyze the role of policy advocacy in addressing social problems in accordance with the NASW Code of Ethics.
2. Use a multilevel policy advocacy framework to advocate for policies which promote human rights, social and economic justice, and addresses culturally influenced barriers to services presented by practitioners, organizations, and larger systems for populations of the Southwest.
3. Identify interconnections between micro policy advocacy interventions, mezzo policy advocacy interventions, and macro policy advocacy interventions.
4. Develop a plan for engagement in micro, mezzo and macro policy advocacy for local, state and federal policies that address social problems impacting diverse populations and constituencies of the Southwest.
5. Apply policy advocacy skills across complex social problems across social sectors that includes collaboration with colleagues and clients.

SOWK 5280. Advanced Generalist Practicum Experience I**3 Credits (3)**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.

Prerequisite: SOWK 5190.

SOWK 5290. Advanced Generalist Practicum Experience II**3 Credits (3)**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.

Prerequisite: SOWK 5280.

SOWK 5310. Advanced Social Work Mental Health Practice**3 Credits (3)**

This course is designed to add to the practice sequence for Masters Level students in Social Work. It addresses social work assessment of major mental health issues across the life span with an emphasis on resiliency and coping skills. Culturally responsive practices are applied to the major issues of mental health. Basic psychopharmacology, neurobiology and the ways in which Social Workers interact with clients to aid education and effective treatment of medical interventions will be a prominent part of this course. Evidence-based practices useful for work in various disorders will be incorporated. Restricted to: MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Critically analyze the concepts of mental health and psychopathology
2. Assess social, political, and economic conditions which interfere with mental health, focusing on populations at risk for discrimination and oppression
3. Conduct assessments of mental and emotional functioning using approved models and tools
4. Apply DSM five criteria across a range of ages and cultures
5. Differentiate culturally based behaviors from psychopathology
6. Promote strengths-based approaches to avoid labeling,
7. Recognize connections between psychopharmacological interventions, symptom reduction, and side effects
8. Identify evidence-based practices for work with clients exhibiting a range of mental disorders

SOWK 5320. Advanced Practice with Individuals**3 Credits (3)**

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Students will integrate key social work theories for direct practice into work with individuals
2. Students will select, apply and evaluate culturally-relevant interventions for practice with individuals
3. Students will describe and demonstrate the application of key approaches for direct practice with individuals
4. Students will apply skills for clinical case formulation

SOWK 5330. Advanced Practice with Groups**3 Credits (3)**

This course will address the knowledge, values and skills needed to work effectively with diverse populations in group settings. The course will build on Foundation Year courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Demonstrate the ability to conduct a group
2. Apply a theoretically informed knowledge base of group development as it is executed across systems
3. Demonstrate knowledge of the variety of roles that group leaders and participants need to address in accomplishing the successful mission of the group
4. Establish a process that encourages clients to embrace the mutual aid function of groups, embracing an attention to multiple helping relationships
5. Advocate for a democratic process within all groups, encouraging a mutual emphasis on empowerment
6. Apply skills for social work assessment to group assessments

SOWK 5340. Advanced Practice with Families**3 Credits (3)**

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Describe a range of approaches to and issues in social work practice with families
2. Apply social work assessment and planning skills to work with family systems
3. Critically analyze the role of personal experiences in our perceptions of and work with families
4. Describe key features of core approaches to family therapy and critique their application in models
5. Demonstrate the application of at least one core approach to family therapy
6. Apply considerations for ethical decision making to work with families

SOWK 5350. Advanced Practice with Organizations and Communities**3 Credits (3)**

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. . Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Identify key theories, history, and ideological influences for macro social work practice.
2. Describe and apply methodology of Root Cause Analysis for a selected community/social issue of concern.
3. Use a range of approaches to assess a community/social issue of concern.
4. Create a community Power Map for the purposes of advocacy and social change.
5. Conduct an Organizational Capacity Assessment.
6. Present a strategic plan for implementing a data-informed initiative.
7. Describe formal methods/techniques for program assessment.

SOWK 5510. Family and Child Welfare Policy**3 Credits (3)**

This course will enhance students' ability to offer child welfare services that respect cultural differences, reflect current policy knowledge concerning child maltreatment, build on the advocacy and protective capacities of individuals, families and communities and encourage permanency for children and preservation of families. Required basic knowledge of child welfare and assessment skills. Outside majors require instructor permission. May be repeated up to 3 credits.

SOWK 5996. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

SOWK 5997. Independent Study**1-3 Credits (1-3)**

Individual study to augment depth of knowledge in area related to course of study. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOWK 5999. Graduate Thesis**1-6 Credits (1-6)**

Required for thesis option. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

Office Location: Health and Social Services Bldg. Suite 210

Phone: (575) 646-2143

Website: <http://socialwork.nmsu.edu>

Social Work - Bachelor of Social Work

The BSW program prepares you for a beginning professional level of generalist social work practice with an understanding and appreciation of the cultural diversity of the Southwest.

To be admitted as a BSW candidate, you must formally apply for admission to the program. A 2.5 grade-point average is required for the application. Consult the pre-social work major advisor, located in the Center for Academic Advising and Student Support. The deadline for submitting applications is the last Friday in January. The program is fully accredited by the Council on Social Work Education (CSWE).

General Education Requirements

Students need to complete the New Mexico State University general education requirements before applying to the Bachelor of Social Work program. The School of Social Work requirements include SOWK 2110G Introduction to Human Services & Social Work .

Once accepted into the program, students also need to meet a Cultural Emphasis requirement (6 credits). If the Cultural Emphasis classes are also Viewing a Wider World classes, you still need to complete the total number of specified upper-division credits necessary for graduation. Highly recommended electives for social work students include courses in sociology, history, Spanish, psychology, family life, child development, English, philosophy, anthropology, computer science, criminal justice, government and economics. Electives must be sufficient to bring total credits to 120, including 48 upper-division credits, for graduation.

Departmental Requirements

Preparation for entry-level professional social work requires a thorough knowledge of theory and skills; therefore, the high number (57) of core social work credits is required. A grade of C- or better is required for all social work courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements (6 credits), and elective credits to total a minimum of 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G or ENGL 1110H	Composition I	4
<i>English Composition - Level 2</i>		
ENGL 2210G or ENGL 2221G	Professional & Technical Communication Writing in the Humanities and Social Science	3
<i>Oral Communication</i> ¹		3
<i>Area II: Mathematics</i> ²		
MATH 1350G or MATH 2350G	Introduction to Statistics Statistical Methods	3
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i> ³		
SOWK 2110G	Introduction to Human Services & Social Work	3

Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) ¹		3-4
BIOL 1120G & BIOL 1120L or BIOL 1130G	Human Biology and Human Biology Laboratory Introductory Anatomy & Physiology (non-majors)	4
<i>Area V: Humanities</i> ¹		3
<i>Area VI: Creative and Fine Arts</i> ¹		3
<i>General Education Elective</i>		
CEPY 1120G	Human Growth and Behavior	3
Viewing A Wider World ⁴		6
Departmental/College Requirements		
SOWK 3110	Sociocultural Concepts	3
SOWK 3120	Human Behavior and the Social Environment I	3
SOWK 3130	Human Behavior and the Social Environment II	3
SOWK 3140V	Introduction to Social Policy: History	3
SOWK 3150	Social Work Research	3
SOWK 3210	Social Work Practice Skills	3
SOWK 3220	Social Work Practice with Individuals	3
SOWK 3230	Social Work Practice with Families	3
SOWK 4110	Social Welfare Policy: Legislation	3
SOWK 4210	Generalist Social Work Practice with Organizations and Communities	3
SOWK 4220	Generalist Social Work Practice with Groups	3
SOWK 4240	Professionalism in the Field of Social Work	3
SOWK 4310	Practicum I	3
SOWK 4311	Practicum Seminar I	3
SOWK 4320	Practicum II	3
SOWK 4321	Practicum Seminar II	3
Second Language Requirement		6-8
Electives, to bring the total credits to 120 ⁵		25-28
Total Credits		120

¹ See the General Education (p. 220) section of the catalog for a full list of courses

² Either MATH 1350G Introduction to Statistics, A ST 311 Statistical Applications, or MATH 2350G Statistical Methods is required for the degree.

³ The Area III: Laboratory Science General Education requirement (BIOL 1120G Human Biology BIOL 1120L Human Biology Laboratory or BIOL 1130G Introductory Anatomy & Physiology (non-majors)) must be completed before starting the SOWK program and requires a grade of C- or better.

⁴ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

⁵ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Social Work, there is a one-year second language requirement. The number of credits a student needs to take may vary depending on their fluency in another language. Please speak with an advisor for more information regarding the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
CHIN 1110 & CHIN 1120	Mandarin Chinese I and Mandarin Chinese II	4-8
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
<i>For Heritage Speakers:</i>		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

A Suggested Plan of Study for Students

This roadmap assumes student placement in either A ST 311 Statistical Applications, MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		
Fall		
ENGL 1110G or ENGL 1110H	Composition I or Composition I	4
One from the following: ¹		4
BIOL 1120G & BIOL 1120L or BIOL 1130G	Human Biology or Introductory Anatomy & Physiology (non- majors)	
Oral Communication Course ²		3
Second Language Requirement Course		3-4
Elective Course ³		1
Credits		15-16
Spring		
One from the following: ⁴		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
CEPY 1120G	Human Growth and Behavior ⁵	3
Second Language Course		3-4
SOWK 2110G	Introduction to Human Services & Social Work ⁵	3
Elective Course ³		3
Credits		15-16
Sophomore		
Fall		
Area V: Humanities Course ²		3
Area VI: Creative and Fine Arts Course ²		3
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	

ENGL 2221G	Writing in the Humanities and Social Science	
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course ²		3-4
Elective Course ³		3
Credits		15-16
Spring		
Viewing a Wider World Course ⁶		3
Viewing a Wider World Course ⁶		3
Elective Course ³		3
Elective Courses ³		6
Credits		15
Junior		
Fall		
Elective Course ³		3
SOWK 3210	Social Work Practice Skills	3
SOWK 3110	Sociocultural Concepts	3
SOWK 3120	Human Behavior and the Social Environment I	3
SOWK 3140V	Introduction to Social Policy: History	3
Credits		15
Spring		
Elective Course ³		3
SOWK 3130	Human Behavior and the Social Environment II	3
SOWK 3220	Social Work Practice with Individuals	3
SOWK 3230	Social Work Practice with Families	3
SOWK 3150	Social Work Research	3
Credits		15
Senior		
Fall		
Elective Course ³		3
SOWK 4310	Practicum I	3
SOWK 4311	Practicum Seminar I	3
SOWK 4210	Generalist Social Work Practice with Organizations and Communities	3
SOWK 4110	Social Welfare Policy: Legislation	3
Credits		15
Spring		
Elective Course ³		3
SOWK 4320	Practicum II	3
SOWK 4220	Generalist Social Work Practice with Groups	3
SOWK 4240	Professionalism in the Field of Social Work	3
SOWK 4321	Practicum Seminar II	3
Credits		15
Total Credits		120-123

¹ BIOL 1120G Human Biology/ BIOL 1120L Human Biology Laboratory or BIOL 1130G Introductory Anatomy & Physiology (non-majors) must be completed before starting the S WK program and require a grade of C- or better.

² See the General Education (p. 220) section of the catalog for a full list of courses

³ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

- ⁴ Either A ST 251G Statistics for Business and the Behavioral Sciences/STAT 251G Statistics for Business and the Behavioral Sciences, STAT 271G Statistics for Psychological Sciences or A ST 311 Statistical Applications is required for the degree but students may need to take any prerequisites needed to enter the course first.
**students who choose to take A ST 311, will need to take an additional Mathematics General Education course in order to meet the requirement.*
- ⁵ CEPY 1120G Human Growth and Behavior and SOWK 2110G Introduction to Human Services & Social Work: must be completed before starting the S WK program and require a grade of C- or better.
- ⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses

NOTE: Students need to submit a formal application packet to the School of Social Work in January and be accepted into the program before they may take junior or senior year courses.

A grade of C- or better is required for all social work courses.

Sociology

Undergraduate Program Information

The undergraduate major in sociology is broad in scope. It prepares students for various public and private sector employment opportunities, including market research, personnel management, data analytics, computational sociology, human relations, law enforcement, health services, and many other fields. Successful students often use their major as pre-professional preparation for advanced degrees in law, business, education, counseling, and other social science-based careers. Courses are offered both online and on campus.

Graduate Program Information

The program is designed to prepare students for doctoral study in sociology as well as employment in research and applied areas of the field. In addition to the on-campus program, we also offer an online MA for students who cannot attend in person. Through small seminars, on-campus graduate students engage in discussions of subjects that often result in thesis and internship topics. In online seminars, small classes allow for in-depth discussions that can generate ideas for research as well as knowledge for applied work environments. In both online and on-campus settings, faculty members and students work toward the mutual goal of developing the full potential of each student.

The Southwest and Border Region

Our unique location attracts faculty and students who are interested in peoples of the southwest, particularly Hispanics/Latinos and Native Americans. In addition, our proximity to the U.S.-Mexico border provides an ideal laboratory for examining such issues as globalization, transnational migration and the consequences of border development.

Social Inequality

Our faculty members examine the intersection of race, class and gender oppression in their teaching and research, with special attention to educational, rural/urban, ecological, and global disparities. This examination aims to address social problems such as poverty and racial/ethnic inequality.

Program Options and Requirements

Students seeking a master's degree in sociology should have taken undergraduate courses in methods and statistics or their equivalent.

Students who have not taken these courses are encouraged to complete them before beginning their graduate study or in consultation with the sociology graduate director as soon as possible.

Graduate students in sociology have two program options, thesis or non-thesis. Faculty consider the students special interests and career plans in advising regarding their choice of program options. The thesis option is typically selected by students who intend to pursue a Ph.D. degree, while the non-thesis option is commonly pursued by those desiring immediate employment in research and applied areas in business, government, education, social welfare, and health. The non-thesis, coursework only option is currently the only option available for online MA students. All students must pass a final master's examination.

Degrees for the Department

Bachelor Degree(s)

- Sociology - Bachelor of Arts (p. 1317)
- Sociology - Bachelor of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/sociology-ba-online/>)

Master Degree(s)

- Sociology - Master of Arts (p. 164)
- Sociology - Master of Arts (Online) (<http://catalogs.nmsu.edu/online/nmsu-online/sociology-ma-online/>)

Minors for the Department

- Sociology - Graduate Minor (p. 218)
- Sociology - Undergraduate Minor (p. 1319)

Academic Department Head - David G. Ortiz, Ph.D.

Professors - LoConto, Rice; **Associate Professors** - Ortiz, Pelak, Steinkopf, Way; **Assistant Professors** - Arnett, Bermúdez Tapia, Harper, Newby, Taylor; **Emeritus Professor** - Hoffman, Loustaunau

S. Arnett, Ph.D. (University of Notre Dame)– education, race and ethnicity, social inequalities; B. Bermúdez Tapia, Ph.D. (University of Colorado, Boulder)– international migration, race and ethnicity, qualitative methodology; H. Harper, Ph.D. (University of California, San Diego)– political sociology, policy design and development, computational analysis; D. LoConto, Ph.D. (Oklahoma State University)– classical American social thought, popular culture, social psychology; C. A. Newby, Ph.D. (University of Texas at Austin)– race/ethnicity/minority relations, immigration, demography; D. Ortiz, Ph.D. (University of Notre Dame)– social movements, political sociology, Latin America; C. Pelak, Ph.D. (Ohio State University)– social inequalities, race and ethnicity, sociology of sport; J. Steinkopf-Rice, Ph.D. (Washington State University)– gender, globalization, communities; J.C. Rice, Ph.D. (Washington State University)– environment, society and technology, political sociology; M. Taylor, Ph.D. (University of Notre Dame)– computational/quantitative methods, culture, cognitive sociology; S. Way, Ph.D. (University of Arizona)– education, gender, juvenile delinquency.

Sociology Courses

SOCI 1110G. Introduction to Sociology

3 Credits (3)

This course will introduce students to the basic concepts and theories of sociology, as well as to the methods utilized in sociological research. The course will address how sociological concepts and theories can be utilized to analyze and interpret our social world, and how profoundly our society and the groups to which students belong influence them. Students will be given the opportunity to challenge their “taken-for-granted” or “common sense” understandings about society, social institutions, and social issues. Special attention will also be paid to the intimate connections between their personal lives and the larger structural features of social life. In addition, the implications of social inequalities, such as race/ethnicity, gender, and social class will be central to the course’s examination of social life in the United States.

Learning Outcomes

1. Define sociological perspectives and the contributions that sociological knowledge can bring to the social sciences.
2. Understand the sociological imagination and explain the relationships between social structures, social forces and individuals.
3. Demonstrate the ability to apply the perspectives of symbolic interactionist theory, conflict theory, and structural-functionalist theory to qualitative and/or quantitative data.
4. Understand and explain intersectionality and the connections between race, class, gender, disability, sexual identity and other forms of structural inequality.

SOCI 2230. Sociology of Sexuality

3 Credits (3)

This course explores all aspects of human sexuality from a sociological perspective. Topics include, but are not limited to, sex work, intimate relationships, sexual response, political movements, power, and the social construction of sexuality. The course also considers how various social statuses such as ethnicity, gender, and social class intersect with sexuality.

Learning Outcomes

1. Identify the central research questions, theories, and methodologies used in the study of human sexuality.
2. Identify and describe biological, cultural, social, and psychological sexual behaviors and response across the lifespan.
3. Identify and describe trends and changes that influence sexual attitudes and values in the U.S. and globally.
4. Describe how sexuality is influenced by contextual factors, such as race/ethnicity, gender, socioeconomic status, disability, and nationality.

SOCI 2240. Sociology of Intimate Relationships and Family

3 Credits (3)

This course provides an overview of contemporary intimate relationships and families from sociological perspectives. We will examine intimate relationships and families as social constructions whose meanings have changed over time and from place to place. This course will aid students in developing a greater understanding of intimate relationships and families as institutions in contemporary U.S. society. Intersections of race, class, gender, sexual orientation, nationality, and other factors within these institutions will be addressed. Community Colleges only.

Learning Outcomes

1. Explain the sociological approaches to researching intimate relationships and families.
2. Describe important sociological research findings concerning intimate relationships and families.
3. Explain how intimate and familial relationships are affected by multiple intersecting inequalities and ongoing events in other social institutions.

SOCI 2261. Issues in Death and Dying

3 Credits (3)

Major personal and social issues related to the process of dying in our culture. Community Colleges only.

Learning Outcomes

1. be able to understand the diversity of the death experience and the various options available in coping with death and bereavement as shown by the student’s participation in class discussions and field trips.
2. better understand death and dying as social phenomena as shown by the student’s reaction papers.
3. have taken an in-depth look at her or his own death with a researched paper. Comprehension will be shown by the student’s grade on the paper.

SOCI 2310G. Contemporary Social Problems

3 Credits (3)

This course studies the nature, scope, and effects of social problems and their solutions. The course will concentrate on sociological perspectives, theories, and key concepts when investigating problems, such as inequality, poverty, racism, alienation, family life, sexuality, gender, urbanization, work, aging, crime, war and terrorism, environmental degradation, and mass media. This course is designed to build students’ sociological understanding of how sociological approaches attempt to clarify various issues confronting contemporary life, as well as how sociologists view solutions to these problems.

Learning Outcomes

1. Identify and explain major social problems in the United States, and how social problems become constructed as problems.
2. Describe and analyze policy related solutions associated with social problems from various perspectives.
3. Critically examine social problems through the use of sociological theories, methods, and empirical techniques.
4. Identify connections, both national and global, between social problems and social inequalities (e.g., social class, race/ethnicity, and gender/sexuality).

SOCI 3110V. Sociology of Religion**3 Credits (3)**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. May be repeated up to 3 credits.

SOCI 3120V. Introduction to Population Studies**3 Credits (3)**

Determinants and consequences of changes in fertility, mortality and migration patterns. Introduction to techniques of demographic analysis. Focus on U.S. and world population issues and their relation to social, cultural, and economic systems. May be repeated up to 3 credits.

SOCI 3150. Social Research: Methods**3 Credits (3)**

An introduction to research design and data collection strategies commonly employed in the social sciences. Topics include experiments, survey research and various other quantitative and qualitative methods. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 3160. Sociological Research: Analysis**3 Credits (3)**

Elementary data analysis class emphasizing descriptive and inferential statistical techniques commonly employed in the social sciences. Topics range from one variable analysis through regression and correlation analysis of two variables. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

Learning Outcomes

1. Critically evaluate understand social statistics from various common sources such as TV, newspapers, research reports, and scholarly articles. –Assessed via discussion, assignments and exams.

SOCI 3165. Sociological Theory**3 Credits (3)**

Analysis of the main historical themes underlying contemporary sociological theory. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 3240. Sociology of the Family**3 Credits (3)**

Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity. May be repeated up to 3 credits.

Learning Outcomes

1. Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity.

SOCI 3245V. Comparative Family Systems**3 Credits (3)**

A comparative analysis of family forms and characteristics in various societies. An examination of the diversity of family practices among ethnic and class groups in the United States. May be repeated up to 3 credits.

SOCI 3250. Sociology of Childhood**3 Credits (3)**

This course examines theories, methods, and empirical research in several areas of the sociology of childhood. Major themes are: (1) how social structure constrains children's lives, (2) how children negotiate, share, and create culture, and (3) how children's experiences vary within and across societies. May be repeated up to 3 credits.

SOCI 3255. Youth and Society**3 Credits (3)**

Comparative historical analysis of social, economic and cultural forces affecting young people. Emphasis on organizational and institutional effects on the well being of children and young adults. May be repeated up to 3 credits.

SOCI 3270. Gender and Society**3 Credits (3)**

Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives. May be repeated up to 3 credits.

SOCI 3310V. Social Issues in the Rural Americas**3 Credits (3)**

Discussion of the major social issues facing the rural United States and borderland areas. Topics include the social history, governmental policies, water rights, land issues and labor. May be repeated up to 3 credits.

SOCI 3315. Urban Society in a Global World: Problems, Prospects, and Promises**3 Credits (3)**

Identification and analysis of the causes and consequences of social issues in urban environments including poverty, crime, terrorism, urban social policy, suburban flight, disinvestment, and deindustrialization. Special emphasis on global forces affecting global urban environments around the world. May be repeated up to 3 credits.

SOCI 3330. Environmental Sociology**3 Credits (3)**

This course provides a sociological examination of the interconnections of human social organization and the biophysical environment. The goal is to make sense of these complex interconnections between society and the environment—including examination of potential causes and solutions to environmental problems in real world settings. May be repeated up to 3 credits.

SOCI 3340V. Social Change**3 Credits (3)**

Explanations of autonomous and directed social change as occurring at the individual, organizational, societal, and international levels. Case studies from around the world. May be repeated up to 3 credits.

SOCI 3410. Race and Ethnic Relations**3 Credits (3)**

Dynamics of racial prejudice and patterns of racial and ethnic interaction in the United States. May be repeated up to 3 credits.

SOCI 3415. Social Inequality**3 Credits (3)**

Analysis of the social distinctions arising from sex, age, occupation, and ethnicity. Emphasis on indicators of social class and patterns of social mobility. May be repeated up to 3 credits.

SOCI 3510. Crime and Society**3 Credits (3)**

Analysis of crime at the interpersonal, organizational, and social structure levels in society. Exploration of contemporary images of crime in mass media. Examination of connections between race, class, gender, and crime in U.S. society. May be repeated up to 3 credits.

SOCI 3520. Juvenile Delinquency**3 Credits (3)**

Nature, extent, and causes of juvenile delinquency; juvenile justice; modern methods of treatment; programs of prevention. May be repeated up to 3 credits.

SOCI 3610V. Sociology of Pop Culture**3 Credits (3)**

This course will provide students with a sociological look at creation, distribution, and effects of popular culture that have shaped, preserved, and conveyed distorted images of social class, race, gender and history to unwary consumers. May be repeated up to 3 credits.

SOCI 3620V. Sports and Society: A Global Perspective**3 Credits (3)**

A critical examination of sports in a global context, emphasizing the social and cultural factors that shape the world of sports and the consequences of sports for societies. Course examines issues of social inequality, violence, media and corporate influence, religion and sports, and the student-athlete experience. May be repeated up to 3 credits.

SOCI 3630. Culture and Social Life**3 Credits (3)**

What exactly does culture look like, and how precisely does it shape—and is shaped by—social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.

Learning Outcomes

1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to include cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 4150. Networked and Connected**3 Credits (3)**

Introduction to social network analysis in sociology. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties.

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 4155. Textual Analysis of Digital and Social Media**3 Credits (3)**

Introduction to some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects.

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 4160. Visualizing Social Life**3 Credits (3)**

Introduction to how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends.

Learning Outcomes

1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 4240V. Comparative Global Family Systems**3 Credits (3)**

The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today. May be repeated up to 3 credits.

SOCI 4310. Community Development**3 Credits (3)**

This is a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Topics include examining what 'community' means, community development versus economic development, and alternative economic activities. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4315. Public Sociology**3 Credits (3)**

This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.

Learning Outcomes

1. Understand the theoretical foundations and debates within public sociology
- 2) Understand various ways public sociology can be practiced outside academia

SOCI 4320. Collective Behavior and Social Movements**3 Credits (3)**

An overview and exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.

SOCI 4335V. Advanced Environmental Sociology**3 Credits (3)**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 4337. Human Society and the Environment**3 Credits (3)**

This course explores the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4410. Diversity in Alternative Families**3 Credits (3)**

Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life. May be repeated up to 3 credits.

SOCI 4420. Sociology of Latinos/as in the United States**3 Credits (3)**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women's issues. Recommended preparatory courses: SOCI 1110G, SOCI 3410, or HIST 367. May be repeated up to 3 credits.

SOCI 4430. International Migration**3 Credits (3)**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4450. Power and Politics in America**3 Credits (3)**

This course provides an introduction to the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems and facilitates the understanding of the processes and consequences of power distributions in the United States. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4460. Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as POLS 469. May be repeated up to 3 credits.

SOCI 4510. Social Deviance**3 Credits (3)**

Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control. May be repeated up to 3 credits.

SOCI 4555. Sociology of Education**3 Credits (3)**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 4992. Directed Readings**1-3 Credits (1-3)**

Individual readings or research for either majors or nonmajors. Consent of Instructor required. May be repeated up to 6 credits.

SOCI 4996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

SOCI 4998. Internship**1-6 Credits (1-6)**

Supervised participation in an appropriate community setting. Taught with SOCI 5998. May be repeated up to 9 credits.

SOCI 4999. Sociology Senior Seminar**3 Credits (3)**

The main goal of this course is to provide Sociology students the opportunity to integrate the knowledge acquired from the classroom with personal real-world experiences in order to explore how a sociological perspective can be applied to one's everyday life and work. Students must be in senior standing to enroll in this course. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

Learning Outcomes

1. Refine and demonstrate students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to a real-world setting.
4. Have the opportunity to critically apply and evaluate the utility of select social theories to a real-world setting.
5. Refine critical writing and thinking skills through class discussions.

SOCI 5110. Perspectives on Sociology**3 Credits (3)**

Overview of Sociology and development of students' sociological imaginations. Understanding the place of sociology in career development and the application of Sociology and sociological concepts to the real world. May be repeated up to 3 credits.

Learning Outcomes

1. Refine students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to the real world.
4. Explore how students can utilize sociology in achieving their career goals.
5. Refine students' critical writing and thinking skills through class discussions.

SOCI 5150. Advanced Seminar in Social Networks**3 Credits (3)**

Advanced introduction to social network methods. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties. Includes hands-on experience with the R statistical computing environment

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 5153. Seminar in Sociological Research**3 Credits (3)**

Exploration of research methods, issues, and practical application. Restricted to: Sociology Majors May be repeated up to 3 credits.

SOCI 5155. Advanced Seminar in Text Analysis for the Social Sciences**3 Credits (3)**

Advanced exploration into some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects. Includes hands-on experience with the R statistical computing environment.

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 5157. Seminar in Qualitative Research Methods**3 Credits (3)**

This course provides an in-depth examination of qualitative research methods, including the logic, time, and purpose of using such methods.

Prerequisite: Graduate standing.

SOCI 5158. Advanced Seminar in Visual Methodology**3 Credits (3)**

This course focuses on the potential and the qualities of visual data collection in research and will start with a review of the diversity of research strategies and ethics that incorporate visual data. We will discuss different ways of using visual methods in research alongside epistemological theory of understanding what it means to look at the world. We will use our own experiences of looking and feeling to consider what visual methods can contribute to effective ethnographic research. Students must be graduate students to enroll.

Learning Outcomes

1. Learn the basic fundamentals of visual qualitative inquiry.
2. Learn the concept of ethics and reflexivity in qualitative research.
3. Learn how to design visual qualitative research.
4. Understand the different methods used in visual qualitative research.
5. Select and use appropriate visual qualitative methods to answer research questions.

SOCI 5160. Advanced Seminar in Data Visualization**3 Credits (3)**

Advanced exploration into how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends. Includes hands-on experience with the R statistical computing environment, especially the ggplot2 package.

Learning Outcomes

1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 5163. Issues in Advanced Quantitative Analysis**3 Credits (3)**

Advanced methods of sociological analysis are examined in detail. Restricted to: Sociology majors. May be repeated up to 3 credits.

SOCI 5165. Seminar in Classical Social Theory**3 Credits (3)**

Analysis of classical social thought within the discipline. Restricted to: Sociology majors. May be repeated up to 3 credits.

SOCI 5170. Advanced Individual and Society**3 Credits (3)**

Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict. May be repeated up to 3 credits.

SOCI 5175. Symbolic Interaction**3 Credits (3)**

This seminar will provide you a backdrop on Symbolic Interactionism, focusing on the direct and indirect antecedents of the theory, as well as current research and theoretical development up to the present. May be repeated up to 3 credits.

SOCI 5270. Graduate Seminar in Sex and Gender**3 Credits (3)**

Comprehensive examination of current gender identity and gender stratification issues. May be repeated up to 3 credits.

SOCI 5310. Advanced Seminar in Community Development**3 Credits (3)**

This is in an advanced seminar addressing a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Students must be in a graduate student to enroll. May be repeated up to 3 credits.

SOCI 5315. Public Sociology**3 Credits (3)**

This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.

Learning Outcomes

1. Understand the theoretical foundations and debates within public sociology
2. Understand various ways public sociology can be practiced outside academia

SOCI 5320. Advanced Collective Behavior and Social Movements**3 Credits (3)**

An advanced exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.

SOCI 5335. Seminar Environmental Sociology**3 Credits (3)**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 5337. Seminar in Human Society and the Environment**3 Credits (3)**

This is an advanced seminar exploring the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.

Prerequisite: Graduate Student Status.

SOCI 5410. Advanced Race and Ethnic Relations**3 Credits (3)**

In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S. May be repeated up to 3 credits.

SOCI 5415. Graduate Social Stratification**3 Credits (3)**

Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender. May be repeated up to 3 credits.

SOCI 5420. Advanced Sociology of Latinos/as in the United States**3 Credits (3)**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women's issues. May be repeated up to 3 credits.

SOCI 5430. Advanced International Migration**3 Credits (3)**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. Students must be Graduate students to enroll. May be repeated up to 3 credits.

SOCI 5440. Advanced Sociological Perspectives on the U.S.-Mexico Border**3 Credits (3)**

Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment. May be repeated up to 3 credits.

SOCI 5450. Advanced Seminar in Power and Politics in the United States**3 Credits (3)**

This is an advanced seminar addressing the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems. It facilitates an understanding of the processes and consequences of power distributions in the United States. Students must be Graduate students to enroll. May be repeated up to 3 credits.

SOCI 5460. Advanced Issues in Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as POLS 569. May be repeated up to 3 credits.

SOCI 5510. Issues in Social Deviance**3 Credits (3)**

Selected forms of deviant behavior, social issues, and social problems. May be repeated up to 3 credits.

SOCI 5515. Sociology of Organizations**3 Credits (3)**

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment. May be repeated up to 3 credits.

SOCI 5555. Advanced Sociology of Education**3 Credits (3)**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 5610. Advanced Seminar in Popular Culture**3 Credits (3)**

This course delves into Popular Culture and how Sociologists define and evaluate Popular Culture in the world today. Students will learn about diverse forms of Popular Culture, their meanings, and how social theory is applied to how Popular Culture is commodified and consumed. Students must be a graduate student to enroll.

Learning Outcomes

1. Explain and show an advanced understanding of the relationship of popular to culture.
2. Have an in-depth knowledge of Critical Theory as it applies to the culture industry.
3. Understand the relationship of the individual and social issues to both popular culture and technologically driven cultural changes.
4. Apply critical thinking about the popular culture experienced in your day-to-day existence and its meaning to everyday life.
5. Read empirical and theoretical writings, summarize and expand upon their core ideas.
6. Be able to discuss as well as compare and contrast various issues associated with popular culture.

SOCI 5630. Advanced Seminar in Culture and Social Life**3 Credits (3)**

What exactly does culture look like, and how precisely does it shape—and is shaped by—social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.

Learning Outcomes

1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to included cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 5991. Special Research Problems**1-3 Credits (1-3)**

Individual analytic or experimental investigations. May be repeated up to 6 credits.

SOCI 5996. Graduate Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

SOCI 5998. Internship**1-6 Credits (1-6)**

Supervised participation in appropriate occupational setting. Taught with SOCI 4998 with additional work required at the graduate level. May be repeated up to 12 credits.

Learning Outcomes

1. Various

SOCI 5999. Master's Thesis**1-6 Credits (1-6)**

Thesis. Consent of instructor required. Restricted to Sociology majors. May be repeated up to 88 credits.

Learning Outcomes

1. Various

Phone: (575) 646-3448

Website: <http://sociology.nmsu.edu>

Email: sociology@nmsu.edu

Sociology - Bachelor of Arts

Departmental Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2</i>		
Select one from the following:		3
ENGL 2210G	Professional & Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
<i>Oral Communication</i>		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
<i>Area II: Mathematics</i>		3
MATH 1130G	Survey of Mathematics (Recommended) ¹	
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		10
SOCI 1110G	Introduction to Sociology (Departmental Requirement)	
Area III: Laboratory Sciences Course (4 credits) ²		
An additional Area IV: Social/Behavioral Sciences Course (3 credits) ²		
<i>Area V: Humanities</i> ²		3
<i>Area VI: Creative and Fine Arts</i> ²		3
<i>General Education Elective</i> ²		3-4
Viewing a Wider World ³		6
Departmental/College Requirements		
SOCI 3165	Sociological Theory	3
SOCI 3150	Social Research: Methods ^{4,5}	3
SOCI 3160	Sociological Research: Analysis ⁴	3
SOCI 4999	Sociology Senior Seminar	3
<i>Departmental Electives</i>		
SOCI courses of any level		6
SOCI courses that are Upper-Division		6
SOCI courses 4000-level (excluding SOCI 4999) ⁶		6

Second Language: (not required)	
Electives, to bring the total credits to 120 ⁷	52
18 credits of the electives must be Upper-Division	
Total Credits	120-121

- ¹ MATH 1130G Survey of Mathematics is recommended for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
- ² See the General Education (p. 220) of the catalog to view the full list of courses that can be selected to complete this requirement.
- ³ See the Viewing a Wider World (p. 224) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
- ⁴ Criminal Justice/Sociology double majors may be permitted to substitute CJUS 300 Introduction to Criminal Justice Research for SOCI 3150 Social Research: Methods and CJUS 301 Advanced Research Methods for SOCI 3160 Sociological Research: Analysis.
- ⁵ Government/Sociology double majors may be permitted to substitute POLS 300 Political Research Skills for SOCI 3150 Social Research: Methods upon approval of appropriate substitution/waiver forms.
- ⁶ The six credits of SOCI 4000 electives does not include SOCI 4999 Sociology Senior Seminar. SOCI 4992 Directed Readings can be applied to this requirement. A maximum of six credits of SOCI 4992 Directed Readings is allowed. In addition, for those in the Master's Accelerated Program, SOCI 5000 electives can be used to meet the six credit requirement.
- ⁷ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

In addition, substitution/waivers for courses may be available upon consultation with the Department Head in the Department of Sociology. In all cases, the total number of sociology credits (courses with SOCI prefix) must be a minimum of 33.

Second Language

For the Bachelor of Arts in Sociology there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) ¹	3
SOCI 1110G	Introduction to Sociology (C- or better) ²	3
Area V: Humanities Course ³		3

Elective Course ⁴	3
Credits	16
Spring	
Select one from the following:	3
ACOM 1130G	Effective Leadership and Communication in Agriculture
COMM 1115G	Introduction to Communication
COMM 1130G	Public Speaking
HNRS 2175G	Introduction to Communication Honors
Area III: Laboratory Science Course ³	4
Area IV: Social/Behavioral Sciences Course ^{3,5}	3
General Education Elective Course ⁴	3-4
Elective Course ⁴	3
Credits	16-17
Second Year	
Fall	
Select one from the following:	3
ENGL 2210G	Professional & Technical Communication
ENGL 2221G	Writing in the Humanities and Social Science
Area VI: Creative and Fine Arts Course ³	3
Elective Course ⁴	3
Elective Course ⁴	3
Elective Course ⁴	3
Credits	15
Spring	
Sociology- Any Level Elective Course (C- or better)	3
Elective Course ⁴	3
Elective Course ⁴	3
Elective Course ⁴	3
Elective Course ⁴	3
Credits	15
Third Year	
Fall	
VWW - Viewing a Wider World Course ⁶	3
SOCI 3150	Social Research: Methods (C- or better) ⁷
SOCI 3160	Sociological Research: Analysis (C- or better) ⁷
Elective - Upper Division ⁴	3
Elective- Upper Division ⁴	3
Credits	15
Spring	
VWW - Viewing a Wider World Course ⁶	3
SOCI 3165	Sociological Theory (C- or better)
Sociology - Upper Division Elective (C- or better)	3
Elective - Upper Division ⁴	3
Elective Course ⁴	3
Credits	15
Fourth Year	
Fall	
Sociology - Any Level Elective (C- or better)	3
Sociology - Upper Division Elective (C- or better)	3
SOCI - 4000 level Elective (C- or better) ⁸	3
Elective - Upper Division ⁴	3
Elective - Upper Division ⁴	3
Credits	15
Spring	
SOCI 4999	Sociology Senior Seminar (C- or better)
	3

SOCI - 4000 level Elective (C- or better) ⁸	3
Elective - Upper Division ⁴	3
Elective Course ⁴	3
Elective Course ⁴	1
Credits	13
Total Credits	120-121

- ¹ MATH 210G Mathematics Appreciation is required for the degree but students may need to take any prerequisites needed to enter MATH 210G first.
- ² SOCI 1110G counts as an Area IV General Education requirement and towards the major.
- ³ See the General Education (p. 220) section of the catalog for a full list of courses.
- ⁴ Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
- ⁵ SOCI 2310G Contemporary Social Problems may count as an Area IV General Education requirement and towards the major.
- ⁶ See the Viewing a Wider World (p. 224) section of the catalog for a full list of courses.
- ⁷ **Criminal Justice/Sociology double majors:** may be permitted to substitute CJUS 300 Introduction to Criminal Justice Research for SOCI 3150 Social Research: Methods and CJUS 301 Advanced Research Methods for SOCI 3160 Sociological Research: Analysis. **Government/Sociology double majors:** may be permitted to substitute POLS 300 Political Research Skills for SOCI 3150 Social Research: Methods upon approval of appropriate substitution/waiver forms.
- ⁸ The six credits of SOC 400 electives does not include SOCI 4999 Sociology Senior Seminar. SOCI 4992 Directed Readings can be applied to this requirement. A maximum of six credits of SOCI 4992 Directed Readings is allowed. In addition, for those in the Master's Accelerated Program, SOC 500 electives can be used to meet the six credit requirement.

Sociology - Undergraduate Minor

Students who earn a Bachelor of Arts in Sociology may not also earn a minor in Sociology. Students earning the minor must pass 18 credits with grades of C- or higher. Students may count S grades only in courses in which all grades are S/U. Students may substitute an upper division social research methods course for the required SOCI 3150 Social Research: Methods from the Departments of Criminal Justice and Government. Additional research methods courses may be considered. Please contact the Department Head of the Department of Sociology for further consideration. Students making this substitution must still pass 18 total credits in Sociology in order to earn this minor.

Prefix	Title	Credits
Required Courses		
SOCI 1110G	Introduction to Sociology	3
SOCI 3150	Social Research: Methods	3
SOCI 3165	Sociological Theory	3
Additional Sociology credits, of which at least 6 are upper division		9
Total Credits		18

NMSU Global Campus

NMSU Global Campus (<http://global.nmsu.edu> (<http://global.nmsu.edu/>))

The Office of Digital Learning administers NMSU Global Campus, extending the reach of New Mexico State University (NMSU) beyond face-to-face traditional programs to provide opportunities for students to meet their academic, professional, and personal learning goals. NMSU Global Campus is designed to remove geographic divides nationally and internationally to meet the needs of the adult and post traditional learner looking to complete a degree. All programs are offered 100% online.

NMSU Global Campus offers 70+ programs available across the five NMSU System campuses with Associate, Applied Associate, Bachelor, Master and Doctorate degrees as well as Certificates and Graduate Certificates. NMSU Global Campus programs are delivered 100% online, and in technology-mediated formats.

Visit NMSU Global Campus (<http://global.nmsu.edu/>) or contact global@nmsu.edu (online@nmsu.edu) or 888.729.6678.

William Conroy Honors College (Undergraduate)

Dean – Phame Camarena

Associate Dean – Anne Hubbell

Associate Professor (Fellowship Office) – Andrea Orzoff

Associate Professor – Center for Undergraduate Research & Creativity – Tracey Miller-Tomlinson

Associate Professor – Judith Flores Carmona (temporary appointment)

Associate Professor – Rebecca Campbell (temporary appointment)

Director - McNair Scholars Program – Marko Mohlenhoff

Executive Administrative Assistant – MaryLouise Pino

Crimson Scholars Coordinator – Roman Gutierrez

William Conroy Honors Center

Phone: (575) 646-2005

E-mail: honors@nmsu.edu

Website: <https://honors.nmsu.edu/> (<http://honors.nmsu.edu>)

Mission of the William Conroy Honors College

The mission of the New Mexico State University Honors College is to serve the citizens and state of New Mexico by providing an enriching environment for diverse, academically talented, and motivated students. The Honors College also seeks to create a community of scholars and mentors that fosters personal growth, critical thinking, leadership, independence, curiosity, and social responsibility. The college aspires to cultivate student potential to broadly understand and positively impact communities, organizations, and the larger world. The Honors College aims to focus campus attention on excellence in undergraduate

education while strengthening the university's reputation as the university of choice in New Mexico.

In support of this mission, the Honors College integrates the following objectives:

- Provide students with an interdisciplinary, intellectually challenging curriculum that integrates active learning;
- Promote university-wide undergraduate research and experiential opportunities, linking students with faculty mentors;
- Encourage, mentor and guide students seeking postgraduate scholarships and fellowships;
- Offer students opportunities for developing leadership skills;
- Create a residential community that combines learning inside and outside the classroom.

In small classes taught by master teachers, students in the Honors College engage in lively discussion and collaborative investigation of interdisciplinary topics. By taking honors courses, students may also work toward completing general education requirements and disciplinary requirements in the major.

Students in the Honors College are 'dual citizens', meaning they enroll in both the college(s) of their major/minor and the Honors College. The Honors College does not offer a degree instead, it offers students the opportunity to graduate with various levels of honors distinction (described below).

Admission to the Honors College

Students admitted to the Honors College are designated as Crimson Scholars, the following eligibility criteria apply:

Automatic Eligibility. Entering freshmen are automatically eligible for admission to the Honors College and Crimson Scholars by meeting one of the following criteria:

- composite ACT score of 26 (or 1240 SAT score); or
- high school GPA of 3.75 or higher

Admission by Petition. Entering freshmen who have an ACT score of at least 24 (or 1200 SAT score) or a high school GPA of 3.50 may submit a written petition for provisional admission to the Honors College using a form provided by the Honors College office upon the request of the student.

Transfer and Continuing Students. Transfer and continuing students who have earned at least 3 college credit hours will be eligible for admission to the college on the basis of a cumulative college GPA that meets eligibility requirements for continuing students (see below).

Eligibility for Continuing Membership. The eligibility criteria for continuing membership in the Honors College is the same as for continuing Crimson Scholars status. The requirements are:

- Fewer than 28 hours earned: 3.3 GPA
- More than 28 hours earned: 3.5 GPA

Appeals. Students who fall below the designated GPAs and lose their eligibility for Honors College status due to extraordinary circumstances may petition the Honors College Dean.

Enrolling in Honors Courses

All Crimson Scholars may enroll in Honors courses. The eligibility requirements to enroll in lower-division honors courses are the same as those pertaining to admission to the college and continuance in the college. For upper-division courses, the requirement is a cumulative 3.2 GPA. Students lacking these requirements may petition the Honors College Dean for permission on a case-by-case basis.

Graduating with University Honors

The Honors College offers two program options:

1. Graduating with Distinction in University Honors and
2. The Honors Certificate

Each option has separate eligibility requirements, benefits and forms of recognition for the student. Almost all honors courses fulfill university general education and viewing a wider world requirements.

Any student who attains an overall GPA of 3.5-4.0 and who completes 6 credits of honors course work, with at least 3 credits at the 300 level or higher, is eligible to graduate with the Honors Certificate.

Any student who attains an overall GPA of 3.5-4.0 and who completes 15 credits of honors coursework, with at least 6 credits at the 300 level or higher, and the honors capstone, is eligible to graduate with Distinction in University Honors. To have these courses count toward one of these programs, a student must earn at least a B. Students should plan to take 12-15 credits in official Honors College classes but may take up to 6 credits in Contract or Master's Accelerated Classes. Contract classes must be at the 300 level or higher and in a student's major (VWW courses do not count). The final 3 credits to graduate with a Distinction in Honors is in the form of an Internship Capstone course or a Research/Creative Activity Capstone course. Both options involve the completion and dissemination of a capstone project.

University Honors Course Options

Honors credits may be earned through both HNRS and H designated courses. Regular Honors course options include Gen Ed, VWW, and Departmental Honors options. The Honors Program is designed to maximize student flexibility and also includes the opportunity to complete 6 credits of Honors Contracts in the student's field of study. Honors credit may also be earned from education abroad and structured service experiences. Honors internship, directed research, and independent study options also ensure students can tailor their training to personal needs while building a resume of experience.

To complete the Honors Program, all students must propose and complete an Honors Capstone Project which includes an Honors Thesis (Research or Creative Project), Internship Capstone, or Independent Studies option. Students may petition to substitute a capstone project from their major field of study, in advance, with an additional Honors component of their work.

Detailed information on earning Honors credits and procedures for the Honors Capstone options can be found at the Honors College web pages: <https://honors.nmsu.edu/> (<http://honors.nmsu.edu>)

Senior Capstone

The University is an academic community where new knowledge is created, the boundaries of creative expression are expanded, and standards for best professional practice are enhanced. In recognition

of these important processes, all students that wish to graduate with University Honors recognition are required to participate in a capstone experience that features one of these activities:

Thesis — The thesis is an independent scholarly or scientific research project that is undertaken with the advice and direction of a member of the university faculty. The thesis does not need to be on a topic in the student's major field, but must meet the guidelines and protocols of the discipline in which it is written. The student's faculty advisor will review the student's thesis and determine a final grade. (HNRS 400 or approved substitution)

Creative Arts or Performance Project — The Senior Creative Arts/Performance project may take the form of an exhibition, written piece, performance, recital or other event deemed appropriate by the faculty advisor and the Dean of the Honors College. In addition to the performance or exhibition, the student must complete a written report, artist statement, or description of the project that is approved by the faculty advisor, to be filed with the Honors College. (HNRS 400 or approved substitution)

Capstone Internship with Project — The Honors Capstone Internship shall be undertaken under the auspices and supervision of an agency approved by the Dean of the Honors College and earn Honors internship credits. A NMSU advisor must approve the project and monitor its progress. To qualify as an Honors Capstone, this work must be more than simply a certain number of hours in service to an agency. It must also involve an original project that meets a need for the agency or promotes the student's professional development beyond the hours of work documented. The results of this project should include some form of written report along with a presentation to the appropriate audience. A log and journal, including a reflective component, shall be kept and submitted by the student. (HNRS 410 or approved substitution)

The Capstone is normally completed during the senior year and may be undertaken only if the student meets the eligibility requirements for graduation from the College (3.5 minimum GPA and the required courses). The Capstone carries 3 graded credit hours.

- Before beginning the final project, the student must choose a faculty advisor and file with the College a proposal that is approved by the faculty advisor and the Dean of the Honors College. The final project is graded by the faculty advisor, who submits a final grade to the Dean of the Honors College.
- Candidates for graduation with University Honors and Distinction in University Honors are expected to make presentations of their final projects at one or more of the following:
 - The Undergraduate Research and Creative Arts Symposium held every Spring Semester,
 - Research and Creative Week presentation in the Fall term,
 - A department seminar,
 - A seminar sponsored by the Honors College,
 - A public reading or exhibition,
 - A meeting of the agency board of directors,
 - Or any other method of presentation deemed appropriate for the discipline and format of the project.
- The written component of the final project shall be filed with the Honors College.

Although most students will earn Honors Capstone Credit through HNRS (400, 410, 420), students may petition, in advance, to substitute capstone equivalent work from another department but are expected to meet the

same standards for proposal, work submitted, and presentation as the Honors Capstone requirements.

The capstone options are designed to be flexible, however, they are not all inclusive. Students that wish to propose an alternate capstone strategy that meets the principles and goals of this work, are encouraged to meet with the Dean of the Honors College.

Updated proposal and application materials for Honors Capstone work is available on the Honors College website <https://honors.nmsu.edu/> (<http://honors.nmsu.edu>).

Community Service Options

The Honors College encourages its students to perform volunteer public service. Under certain circumstances, public service may be used as an alternative to completing some of the requirements for graduation from the Honors College. The following guidelines apply:

During the sophomore, junior or senior year, a student with at least a 3.5 GPA may undertake community service with an agency or organization in Doña Ana County (or an agency outside the area approved by the Honors College Dean) to earn a waiver of up to 3 of the hours required for University Honors (not including the Final Project). A minimum of 15 hours of community service per week, per semester is required for each honors credit hour to be waived. Community service hours must be verified by a supervisor of the agency or organization on a form approved by the Honors College. On-campus activities are not included under this option. The student must also certify that the community service hours are not being used for any course or degree requirement. Approval of the Dean of the Honors College must be obtained prior to beginning volunteer service to be eligible for this option.

International Study Option

Students in the Honors College are strongly encouraged to participate in an international experience. An NMSU honors student with at least a 3.5 GPA may earn a waiver of up to 3 credit hours required for University Honors for such international study (not including the Capstone). This waiver will be awarded for college credit earned while participating in any international study program approved by the Honors College. One honors hour will be waived for each 3 semester credit hours earned with a grade of 'A', 'B', or 'S'. Permission to use this option must be approved in advance by the Honors College.

Note: Waiver of university honors credit for service learning or international study does not reduce or affect in any way the total number of hours required for graduation. Waiver of honors credit for service learning or international study cannot be applied toward the capstone requirement.

Honors Certificate Program

Sophomores, juniors and seniors with a cumulative grade-point average of 3.2 are eligible for the Honors Certificate Program. A student who completes at least two 300- or 400-level honors seminars will be given a Certificate of Distinction at graduation and special recognition in the commencement program. See the honors Dean for details on available seminars, Honors College, Conroy Honors Center.

Crimson Scholars Program

The Crimson Scholars Program is a benefits and recognition program for academically superior students who have a cumulative 3.5 GPA and are

taking three or more credits per semester. Crimson Scholars receive a number of benefits, including:

- Automatic eligibility for all Honors courses
- Early registration
- Extended library check-out privileges
- Special advising
- The option to live in the Honors Living Learning Community in our residence hall.
- Students who earned at least 75% of their credits from New Mexico State University with Crimson Scholar status¹ at the time of graduation receive a "Crimson Scholar Graduate" notation on their transcript.
- Students who complete 75% of their credits as Crimson hours¹ from New Mexico State University at the time of applying for their degree, receive recognition in the commencement program and are eligible to purchase a Crimson Scholar cord for graduation.
- Students who have maintained Crimson Scholars status for 24 Crimson hours¹ from New Mexico State University earn a Crimson scholar pin.

To be eligible for the Crimson Scholars Program, applicants must be degree seeking.

- Entering freshmen must have either:
 - a minimum ACT standard composite score of 26;
 - a 3.75 or better high school GPA; or
 - a minimum SAT score of 1240; or
 - a 3.75 or better high school GPA
- Currently enrolled students must have a minimum cumulative GPA of 3.5 for 75% of the credits¹ at NMSU
- Transfer students must have a 3.5 cumulative GPA from their previous institution(s) or complete 3 or more credits¹ at NMSU for eligibility.

To maintain Crimson Scholar status:

- Freshmen entering on an ACT score must maintain a cumulative GPA of 3.5 and complete three or more credits per semester to continue in the program.
- Sophomores, juniors and seniors must maintain a minimum cumulative GPA of 3.5 and be currently enrolled in a total of 3 or more credits¹ per semester at NMSU or any NMSU community college to retain their Crimson Scholars status.
- Crimson Scholars whose GPA drops below the required cumulative 3.5 or drop below the three credit minimum will be dropped from the program. If in the following semester, the student's cumulative GPA and credits again meet the minimum requirement, the student will *automatically* be reinstated.

In recognition of the student's academic achievement, a statement designating "Crimson Scholar Graduate" is placed on the student's transcript after completion of 75% of credits earned at NMSU as Crimson hours¹ at the time of graduation and a minimum cumulative GPA of 3.5. To be designated in the commencement program as a Crimson Scholar graduate, a student must complete a minimum 75% of credits earned at NMSU as Crimson hours¹ at the time of applying for their degree. Crimson Scholars receive recognition in the commencement program and are eligible to purchase a Crimson Scholar cord for graduation. Students who complete 24 Crimson hours¹ from New Mexico State University earn a Crimson Scholar pin. Crimson Scholars are entitled to

early registration and library privileges. Additional information is available from the Crimson Scholars Office, located in the Conroy Honors Center.

NOTE: Crimson Scholars interested in work-study positions must submit a yearly Free Application for Federal Student Aid (FAFSA) and complete a financial aid file with the NMSU Office of Financial Aid.

¹ does not include I or audit course designations at NMSU

The Honors Living and Learning Community (HLLC)

The New Mexico State University Honors Living and Learning Community (HLLC) is an educational initiative that links in-class and out-of-class learning experiences for honors students. The goals of the Honors Living and Learning Community are to:

1. supplement classroom learning experiences with co-curricular programming;
2. foster the development of an honors community that includes honors students, faculty, and staff; and
3. create a supportive environment for honors students.

Above all, the Honors Living and Learning Community aims to develop a small-college environment within the context of a large research university, thus giving students the benefits of both. Honors students, especially first-year students, are encouraged to take advantage of this special opportunity. The Honors Living and Learning Community is comprised of three components:

The Conroy Honors Center — is the academic home of the Honors College. This historic building was designed by the renowned southwestern architect Henry C. Trost and built in 1907 to house the campus chapter of the YMCA. The Conroy Center houses the administrative offices of the program along with three seminar rooms, a student commons area, a kitchen and a computer lab.

The Honors Residence Hall — is the focus of NMSU's vibrant honors community. It is a place where honors students live among a community of excellent students with outstanding academic records and who are interested in getting the most out of the academic opportunities offered to them at a large research institution. It also hosts many social and extracurricular academic activities.

The Honors Residence Hall is equipped with an electronic classroom, where some introductory honors courses may be taught. The honors faculty participate in residence hall programming and frequently attend residence hall floor meetings with students. The Honors Residence Hall is open to all First Year Crimson Scholars.

Honors College information:

Honors College, MSC 3HON
New Mexico State University
P O Box 30001
Las Cruces, NM 88003-8001

Phone: (575) 646-2005
E-mail: honors@nmsu.edu

Crimson Scholars Program information:

Crimson Scholars Program, MSC 3HON
New Mexico State University

P O Box 30001
Las Cruces, NM 88003-8001

Phone: (575) 646-2542
Roman Gutierrez: rgtz129@nmsu.edu

Student Resources

Aggie Health & Wellness Center

The university maintains a well-equipped integrated health center on campus, providing comprehensive medical and acute care, laboratory, pharmacy, and counseling services, EAP, limited workers compensation care and health education services. Hospitalization and emergency services are available in the community. Undergraduate students are eligible for services at the Center. Main Campus students enrolled in 12 or more credits (6 in a summer session) may access the Center without an office visit fee as fees have been paid through full-time enrollment. Students enrolled for less than 12 credits (5 in summer session) may choose to pay the semester health fee of \$105 or a \$35 office visit fee for medical care. The Center accepts payment for medical, laboratory and pharmacy services through cash, credit card, and student account. Filing for insurance reimbursement can be done as well.

Counseling services at Aggie Health & Wellness provide students and the campus with individual, couples and group counseling, crisis intervention, outreach programs, and consultation. We assist students who are dealing with issues such as relationship concerns, depression, anxiety, stress management, trauma and self-esteem and more. In addition, the Aggie Health & Wellness also has services and resources that support harm reduction. These services include: information concerning the decisions that surround alcohol use, sexual assault, and violence prevention; social work services, an on-campus food pantry and provides resource support for students who may need assistance with housing, insurance or other basic needs. All services are strictly confidential and are free.

The Aggie Health & Wellness Center is open Monday- Friday from 8:00 am - 12:00 pm & 1:00pm - 5:00 pm. The Center is closed during the lunch hour from 12:00 pm -1 pm during the academic year and 11:30 am - 1:00 pm when classes are not in session. The Center is located on the corner of Breland and Stewart St (3080 Breland Drive) and offers both in-person and telehealth appointments. For more information, please call (575) 646-1512 or visit the website at wellness.nmsu.edu (<http://wellness.nmsu.edu>).

Campus Dining

Food Services Options

We offer a variety of dining options across our beautiful campus to include a residential dining hall, national and local retail locations, convenience stores, a mobile food cart and the latest addition to campus dining – Robot Food Delivery! We also offer customizable catering for events large and small. Please feel free to contact us in person at our office in Corbett Center Student Union in room 130 next to Taos Dining Hall or give us a call at 575-646-4801. Food can be purchased by utilizing Dining Dollars, Aggie Cash, the NMSU Enhanced Aggie ID Card, a credit/debit card or cash. Food service locations and hours are available at nmsudining.com (<http://nmsudining.com/>). For additional information, please contact the Parking & ID Card Office at (575) 646-4835, via email: idsvs@nmsu.edu, by visiting idcard.nmsu.edu (<https://idcard.nmsu.edu/>) or by visiting the office located in the Follett Bookstore between 8:00am - 4:30pm, Monday thru Friday. Here (<https://map.nmsu.edu/?ct/>) is a link to our campus dining map.

Meal Plan Information

First-year, on campus freshmen are defined as resident students who have been required to attend Aggie Welcome Orientation and include recent high school graduates with any college credits. These students have the choice between the Premium Platinum, Classic Crimson or *Hometown Aggies Plans. The Meal Plan is mandatory for one academic year (unless applying for the Spring Semester only) and will be billed to the student's university account which allows for you to purchase now and pay the balance later or over time!

Any registered student is welcome to participate in the Meal Plan program whether living on or off campus to include continuing, commuter, as well as Graduate students. A variety of Meal Plan choices are available to suit anyone's needs.

To purchase a meal plan or to review policies and procedures, please visit <https://dining.nmsu.edu>. You may also contact the Parking & ID Card Services Offices at (575)646-4835 or connect via e-mail at idsvs@nmsu.edu.

To enhance your meal plan, you can visit nmsudining.com to add brand new "+plus Packages" that will provide you with deals on beverages, amenities, and concessions! You can also add Dining Dollars with a 10% discount through nmsudining.com

**Hometown Aggies plan is only available for students that live in Dona Ana County.*

Campus Tutoring Services

Campus Tutoring Services offers NMSU students unlimited, accessible and convenient tutoring options to supplement their academic experience for our most in-demand courses on campus. Campus Tutoring offers individual and small group tutoring in-person and online via NMSU Zoom.

Campus Tutoring Services, led through a peer tutor model, enhances student's self-belief, giving students control over learning processes and developing confidence and commitment to learning. Campus Tutoring offers a strong and integrated academic support service to students led by experienced and nationally accredited peer tutors. CTS Peer Tutors are the only College Reading and Learning Association (CRLA) certified tutors that serve the entire NMSU campus.

For more information on Campus Tutoring Services, please visit us in Corbett Center Student Union, Room 206, call (575) 646-6050, or review our services at campustutoring.nmsu.edu (<https://campustutoring.nmsu.edu/>)

Career Exploration and Job Search

NMSU provides students with resources for career planning through career advising as well as opportunities for work experience.

Students launch their career plans through Handshake, a career management system that offers a comprehensive array of career programs and services which can be accessed at <https://nmsu.joinhandshake.com/login> (<https://nmsu.joinhandshake.com/login/>).

The following programs develop students' career goals and experience:

On-Campus Employment: Information is available for part-time employment through work-study, regular student employment, and graduate level programs. Available opportunities are advertised

on Handshake at <https://nmsu.joinhandshake.com/login> (<https://nmsu.joinhandshake.com/login/>).

Off-Campus Employment: Part- and full-time jobs in Las Cruces, requiring general or very specific qualifications, are listed on Handshake and candidates may contact the employers for referrals.

Cooperative Education and Internship Program: Information is available in Handshake on Cooperative Education and Internship opportunities offered by government, nonprofit organizations and business/industry. Students seeking this experiential education must register with the Cooperative Education & Internship Program Coordinator any time after their first semester on campus.

Career Fairs: Students have the opportunity to meet employers and discuss job opportunities several times a year by attending a Career Fair. Information on upcoming fairs can be found at <https://oel.nmsu.edu/career-events/career-fairs--future-dates.html>

Career Exploration and Advising: Students can meet with their advisor to explore career and major options as well as develop job search materials such as resumes and cover letters. More information about career development can be found at <https://ssc.nmsu.edu/services/career-development.html>. (<https://ssc.nmsu.edu/services/career-development.html>)

Center for Academic Advising and Student Support

The Center for Academic Advising and Student Support (CAASS) is the central hub for academic and career advising on campus. Located in Educational Services, Suite 200, CAASS advisors teach undergraduate students how to define and achieve their academic, personal, and career goals for college. Although academic advisors help students plan for registration each semester, the primary focus of advising is supporting students as they navigate the university by explaining degree requirements, clarifying policies and procedures, and informing students of resources that will support their success. All undergraduate degree-seeking students will be assigned a CAASS academic advisor. Students can find contact information for their advisor at <https://advising.nmsu.edu/> or by visiting Educational Services, Suite 200 or by calling 575-646-2941. Current NMSU students can use Navigate (<https://nmsu.navigate.eab.com>) (<https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fnmsu.navigate.eab.com%2F&data=04%7C01%7Cmarimaci%40nmsu.edu%7C00d86c6b68104a30db5a08d8e7f47f4f%7Ca3ec87a89fb84158ba8ff11bace1ebaa%7C1%7C0%7C637514384572234721%7CUnknown%7CTWFPbGZsb3d8eyJWljoIMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBtIl6lk1hWwiLCJXVCi6Mn0%3D%7C1000&sdata=vMdgSnCsugNKwLj5aUXMz%2FSZ9leYu1S8eXHYd8Uukw%3D&reserved=0>) to schedule academic advising appointments with their advisor. Both advising and walk-in services are available in-person or virtually via Microsoft Teams.

Cooperative Education and Internship Program

NMSU enjoys a national reputation for its Cooperative Education (Co-op) and Internship Program which contributes to students' total educational experience. Today's competitive employment market demands that students participate in an experiential learning experience related to their major before they complete their college degree. By participating in the Co-op / Internship Program, students integrate academic theory and

practical application in an actual job. Co-op / Internship assignments provide an array of work experiences with employers in business, industry, government and nonprofit organizations.

All Co-op / Internship work assignments are for continuing full-time students and must be completed prior to graduation. For each semester (spring, summer, & fall) that a student completes an approved Co-op / Internship, a notation is placed on his/her official academic transcript. Note: In order to earn the permanent official notation on the academic transcript, required documentation must be completed and turned in on time to the Cooperative Education & Internship Program Coordinator before and after each Co-op / Internship assignment.

Students may register full-time for one or more Co-op / Internship positions throughout the U.S.; and each Co-op / Internship position will last the duration of an academic semester. While on a full-time Co-op / Internship, students are afforded full-time academic status with the university, which protects enrollment status, financial aid status, scholarship status, and other student eligibilities.

Students may also register part-time for a Co-op / Internship position, also known as a parallel Co-op / Internship. Employers are generally located within commuting distance of the university. While on a part-time Co-op/Internship, students work approximately 20 hours per week concurrently with full-time academic enrollment.

All students interested in cooperative education / internships must first register with the Cooperative Education and Internship Program, and complete all registration requirements. Required activities include accessing the student's NMSU Handshake Account and completing an online orientation session. Students are responsible for submitting required enrollment forms, a mid-semester follow-up, and a program evaluation by both the student and employer. International students participating in a Co-op / Internship must follow the application and approval process for Curricular Practical Training (CPT) through the International Student and Scholar Services office along with the Cooperative Education and Internship Program process.

For additional information regarding the Cooperative Education and Internship Program contact or visit us at:

Garcia Center, Room 224
Phone: (575) 646-4115

E-mail: coop@nmsu.edu
Website: <https://nmsu.joinhandshake.com/login> (<https://nmsu.joinhandshake.com/login/>)

Corbett Center Student Union

Corbett Center Student Union (CCSU) serves as the center for campus life, providing programs and services for students and other members of the university community. CCSU is a place to study, relax, meet with student groups, eat, work or play, CCSU offers students, faculty, staff and visitors a variety of services and activities. The student union is home to several student focused administrative offices including Student Involvement & Leadership Programs, Conference Services, Associated Students of NMSU (ASNMSU), Housing & Residential Life, Campus Dining Services, Dean of Students, the Tutoring Center, the student operated radio station, KRUX-FM, and the Round Up newspaper. Services offered at CCSU include an auditorium, meeting rooms, multiple dining facilities, ATMs, a computer lab, study areas, post office, and game room.

For more information contact:

Corbett Center Information Desk
MSC CC, PO Box 30001
Las Cruces, NM 88003
Phone: (575) 646-4411
Email: ccsu@nmsu.edu or <http://ccsu.nmsu.edu> (<https://ccsu.nmsu.edu>)

NMSU Global Campus

The Office of Digital Learning administers NMSU Global Campus, extending the reach of New Mexico State University (NMSU) beyond face-to-face traditional programs to provide opportunities for students to meet their academic, professional, and personal learning goals. NMSU Global Campus is designed to remove geographic divides nationally and internationally to meet the needs of the adult and post traditional learner looking to complete a degree. All programs are offered 100% online.

NMSU Global Campus offers 70+ programs available across the five NMSU System campuses with Associate, Applied Associate, Bachelor, Master and Doctorate degrees as well as Certificates and Graduate Certificates. NMSU Global Campus programs are delivered 100% online, and in technology-mediated formats.

Edgar R. Garrett Speech and Hearing Center

Combining instruction, evidence-based practice, state of the art technology, and service, the Edgar R. Garrett Speech and Hearing Center provides training for students in Communication Disorders and renders service to the community. Students have opportunities to participate in diagnostic evaluations and to provide therapy in the areas of speech, language, hearing, cognition, and swallowing for clients across the lifespan.

Referrals are accepted from all sources (self, medical, school, nonprofessionals). The Edgar R. Garrett Speech and Hearing Center is a fee-for-service clinic where university students, staff, faculty, and their immediate family receive a reduced rate. All services are supervised by speech-language pathologists who are licensed in New Mexico and hold the Certificate of Clinical Competence in Speech-Language Pathology or Audiology from the American Speech-Language-Hearing Association. Services are available in English and Spanish.

For further information, contact:

Edgar R. Garrett Speech and Hearing Center
MSC 3SPE, PO Box 30001
Las Cruces, New Mexico 88003-8001
Phone: (575) 646-3906
TTY: (575) 646-6191
web: <http://spedcd.education.nmsu.edu/cd/shc/> (<https://cd.nmsu.edu/about-erg/new-erg-clinic.html>)

Education Abroad

Education Abroad, a unit within the Office of Experiential Learning, assists colleges and departments with integrating education abroad into the undergraduate and graduate curriculum. Education Abroad manages support services for outbound study abroad students and inbound international exchange students. Education Abroad coordinates all international partner exchange agreements, intensive language immersion, faculty-led international programs, international student teaching programs (ISTP), as well as all credit-bearing international research, service and internships. The unit also sponsors the Education

Abroad Ambassadors Club, a chartered student organization that provides support to international exchange students at NMSU.

All NMSU students, including community college students, may apply to study abroad while maintaining NMSU student status to receive regular course credit through faculty-led international programs, distance education intensive language (DEIL) credit and teacher education credit (graded A+ through F), and/or receive transfer credit (graded CR) per regular NMSU transfer credit guidelines for all other programs. Students must have completed two full semesters of university study, maintained a 2.5+ grade-point-average, be in good academic and disciplinary standing at NMSU, and obtained the permission of their college to enroll in the program. International Business majors must receive approval from their department for study abroad to count as required in their degree plan. An Education Abroad program consisting of at least four weeks of study or university coursework earning 3 credits in a foreign country may count for a waiver of 3 credits of Viewing the Wider World (<https://oel.nmsu.edu/educationabroad/>).

Housing and Residential Life

Living on campus is an investment in a student's academic and social success and overall experience as an Aggie. Residents are instantly part of the campus community – classes, the student union, activity center, library, bookstore, special events, golf course and many other campus resources are all located within walking distance. Studies show that compared to their off-campus peers, students who live on campus are more likely to: maintain higher grade point averages, use campus resources, interact more with peers and professors, and ultimately graduate within the typical four-year span.

Residency Requirement

All incoming first-time, first-year students must reside in university-operated housing or be approved for a first-year residency exemption as part of the campus enrollment process. First-year students will live in the residence halls and must reside for two consecutive semesters to satisfy this requirement (all summer/fall or fall/spring). However, there are a few reasons approved by the Board of Regents for students to be exempted from this requirement:

- The student is living in a structured environment provided by a parent, legal guardian, or immediate family member (defined as a grandparent or aunt/uncle). *Living with an adult sibling is not included in this exemption.*
- Students residing with a spouse, domestic partner, and/or dependent child(ren).
- A student is 21 years or older, enrolled exclusively in distance education, or is active military or a military veteran.
- Other extenuating circumstances include financial hardship or special medical accommodation.

Students are required to submit specific documentation to support each of the reasons presented above when applying for an exemption. Please visit housing.nmsu.edu/exemptions (<https://housing.nmsu.edu/future-residents/exemptions.html>) for more information.

Application Procedures and Acceptance

To qualify for housing, the student agrees to be enrolled continuously in at least half-time or more at either the undergraduate or graduate level during the fall or spring semesters as degree-seeking. Completed applications for housing should be submitted as early as possible, preferably one regular semester in advance. Submission of housing

application indicates acceptance of the terms and conditions of the applicable agreement. Housing applications require a deposit and fee at the time of application. Certain qualifications must be met to apply for summer housing, single-student apartment and family housing.

To view the various housing options visit <http://housing.nmsu.edu/options> (<https://housing.nmsu.edu/options/>) or contact the housing office at (575) 646-3202, housing@nmsu.edu or Housing and Residential Life MSC 3BB, PO Box 30001, Las Cruces NM 88003-8001.

Housing has a May 1 priority deadline for both residence hall and campus apartment contracts. Student family housing applications are accepted on a rolling basis.

The university will assign accommodations subject to available space. Assignments to a particular building, type of accommodation, specific room or apartment, single room or roommate(s) are not guaranteed.

- The university reserves the right to change or cancel assignments in the interest of order, health, safety or discipline with appropriate written notice.
- The university reserves the right to deny housing to any student.

Examples of reasons for denial include, but are not limited to:

- Individuals who have felony criminal convictions that present a concern to the university community
- Individuals who have behavioral problems which may, in the opinion of the university, negatively impact the group-living environment
- Individuals who have been previously terminated from campus housing, or individuals who have poor rental histories

Student behavior expectations, rights, and responsibilities related to living in university-operated housing can be found at housing.nmsu.edu/guide (<https://housing.nmsu.edu/current-residents/guide.html>).

Availability of Units for Students with Disabilities

There are a limited number of specially equipped residence hall rooms, single-student apartments and family housing units available to students with disabilities who wish to reside in campus housing. These are assigned on a first-come, first-served basis. Specific needs or requirements (i.e., roll-in showers, special door openers, etc.) should be discussed with the Disability Access Services on an individual basis **prior to submitting an application**. Disability Access Services can be reached at (575)646-6840 or by email at das@nmsu.edu.

Residence Halls

Residence halls offer furnished, mostly suite-style rooms, large lobbies and plenty of outdoor space. Each residence hall has its a unique character and environment, offering students a variety of choices while providing amenities, social interaction and academic support. **Living Learning Communities (LLCs)** are a benefit for members who live in the same hall and on the same floor with other students who share common interests. Some LLCs require enrollment in one or more academic course and/or may have additional requirements for eligibility.

More information on the extensive offerings of LLCs can be found at housing.nmsu.edu/llc (<http://housing.nmsu.edu/llc/>). Inclusive Housing is offered in the residence halls for students who wish to participate in a living environment where a student can room with any other student regardless of sex, gender, gender identity/expression or sexual orientation. Alcohol is not permitted in the residence halls.

Single Student Apartments and Houses

Campus apartments and houses offer students more than just affordable housing; they offer a unique college atmosphere where neighbors share similar goals and together form an academic community unlike any found off campus. Available for second-year to graduate students, on-campus apartments and houses have the benefits of on-site staff, prompt maintenance and amenities such as a computer lab and laundromat.

Living Communities (LCs) similar to 1st year LLCs are available for upperclassmen based on thematic interests. Efficiencies, one-, two- and four-bedroom options are available and include living rooms and kitchens. Apartments and houses are fully furnished and the semester rate includes utilities, streaming TV and internet connectivity. Campus apartments feature a select number of co-ed housing options, where students may share other student(s) of any gender identity. A limited number of campus houses are available for single students without a roommate and include one bedroom, a study room, kitchen, living room and bathroom.

Student Family Housing

Completed applications for Student Family Housing should be submitted at least six weeks in advance. Family Housing occupants are assigned once the application process is completed. Applications are considered incomplete and cannot be processed if requested information and supporting documents are not provided and payment of the associated fees is not received. Family Housing applicants may select six-, nine- or twelve-month agreement, with thirty (30) day notice to vacate or request for renewal, prior to an expiration of the agreement.

Family units include married couples, married couples with children, single parents with dependent children and domestic partners (as defined by NMSU Policy found at <https://benefits.nmsu.edu/hr-benefits/other1/domestic-partner.html>).

Consideration is also given to veterans and non-traditional dependent family units. As part of the application process, a criminal history check will be conducted for all adult occupants over the age of 18. Current residents and adult occupants over the age of 18 will undergo a criminal history check no less than once a year. In addition, a rental payment history will also be conducted. By signing the application, the applicant authorizes New Mexico State University to conduct these processes.

Results of the criminal history checks and rental payment history may be shared with the applicant. Single-family homes include two bedrooms, a bath, kitchen and living room. Four-bedroom units include two bathrooms, a kitchen and living room. All units offer a stove and refrigerator and are unfurnished. The monthly rent includes utilities, streaming TV service, and internet connectivity. Some pets are allowed in parts of Student Family Housing, reference the pet policy at <https://housing.nmsu.edu/current-residents/guide.html>.

Community Development

Housing and Residential Life develops safe and engaged communities which support students' efforts to achieve academic success and strong social connections at New Mexico State University.

Our live-in student (Resident Assistants) and professional staff members (Resident Directors) work to meet students' needs, and create a fun, positive experience for our residents. Residents can expect to have meaningful conversations with student staff members; enjoy myriad social, educational, and recreational events; and engage in community meetings and health and safety inspections.

Residents are encouraged to join organizations such as Hall/Community Councils, Residence Hall Association (RHA) and the National Residence

Hall Honorary, or other student organizations to help shape the community experience and learn more about leadership skills. Additionally, as part of our commitment to developing a safe and engaged community in campus housing, we hold students accountable in accordance with the Student Social Code of Conduct and the NMSU Resident Handbook.

Books, Supplies, Parking and Transportation

The New Mexico State University bookstore and parking office are both conveniently located at the corner of Jordan Street and University Avenue. The bookstore provides an avenue for students to obtain assistance with purchasing required books and supplies, along with spirit wear and numerous tech and specialty items. The Parking & Transportation office assists with parking permits and transportation services questions.

ID Card Services

The NMSU Aggie ID Card is the official identification card that provides access to services offered at NMSU. The Aggie ID Card serves as a membership card for meals, Aggie Dining Dollars, Aggie Cash, Aggie Print, as a key to the residential halls, access to various buildings, proof of eligibility for access to athletic events and allows for other student services. This information is added to Aggie ID Card after registration for classes. Please visit idcard.nmsu.edu (<https://idcard.nmsu.edu/>) for more information.

Aggie Cash is a pre-paid account that allows you to use your Aggie ID Card to make purchases at locations all over campus. The NMSU Enhanced Aggie ID Card is your Aggie ID and Wells Fargo bank account all in one! The Parking & ID Card Services Office in Barnes and Noble has the information to link your Wells Fargo account to your Aggie ID. For more information please contact us at (575) 646-2306.

Information and Communication Technologies

Information and Communication Technologies (ICT) provides the university community with the computing and communication resources and services that support the educational, research, and public service missions of the university. These resources include NMSU's central computing systems, the network that supports the systems and the wired and wireless functionality through which the Internet is accessed. ICT operates the student computer labs found throughout the Las Cruces campus; maintains and manages laptop, camera, and projector checkout and rental for students; provides network registration of internet connected devices which is required for access to the NMSU network; and provides student printing known as Aggie print. Information about specific resources are available at <https://studenttech.nmsu.edu/>. ICT also provides support for all NMSU technology users through the ICT Help Desk.

For further information, contact:

Information and Communication Technologies (ICT)
MSC 3AT, PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-1840
email: help@nmsu.edu

ICT's web homepage can be found at <http://ict.nmsu.edu>. ICT's Helpdesk webpage can be found at <http://help.nmsu.edu/>. The helpdesk is located in room 105 of the Hardman and Jacobs Undergraduate Center. ICT's

Student Technology and Planning Department's webpage can be found at <https://studenttech.nmsu.edu/>.

National Student Exchange Program

National Student Exchange (NSE), a unit within Education Abroad in the Office of Experiential Learning, offers programs at over 180 colleges or universities across the United States, Puerto Rico, Guam, U.S. Virgin Islands, and Canada. Students pay NMSU tuition and study for a semester or academic year at an NSE campus. NSE allows students to broaden their academic, social, and cultural awareness through study in different geographical settings. To qualify for the program, an applicant must be a full-time student with a 2.5 grade-point average and must be a sophomore, junior, or senior at the time of exchange. There is a priority deadline of February 15th for the following academic year, however, many NSE colleges and universities accept students on a rolling admission basis.

Grades and credit hours earned at the host institution become part of the official NMSU transcript upon approval of the academic department and records officer. Grades are recorded according to the NMSU grading system.

New Mexico State University Library

The New Mexico State University Library offers access to research and general collections in two library facilities located in the heart of the campus. Zuhl and Branson libraries house over millions of items and provide electronic access to scholarly journals, databases, and digital collections for general academic and discipline-specific research. The Archives and Special Collections Department at Branson Library holds unique research archives and rare books related to the history and cultural heritage of New Mexico, the U.S./Mexico border region and the Southwest, as well as the original records of the university. A professional team of faculty and staff dedicated to student success provides reference assistance and research support. A variety of quiet work areas, collaborative group spaces, and private study rooms offer a safe environment conducive to study and research. Computers, scanners, printers, laptops, and other resources are available for students to use. The Zuhl Fuel café is a place to recharge your batteries for those marathon study sessions. More information may be found at <http://lib.nmsu.edu>.

Office of Experiential Learning

The Office of Experiential Learning (OEL) provides comprehensive and quality hands-on learning opportunities that assists students with their experiential educational and career goals. OEL encompasses a variety of programs including Corporate Relations and Career Events, Cooperative Education and Internship Program, Education Abroad and National Student Exchange, Community Engagement and Outreach, and the Passport Acceptance Facility. Corporate Relations and Career Events and the Cooperative Education and Internship Program seek to foster self-direction and personal responsibility as well as assisting students with their career and employment goals by increasing knowledge through real life experiences in order to obtain gainful employment upon graduation.

Community Engagement and Outreach focuses on assisting students with opportunities to apply what they have learned in the classroom into real life settings, which leads to develop soft skills in areas such as demonstrated complexity of understanding, problem analysis, problem-solving, and critical thinking, which leads to greater academic learning, leadership skills, and personal efficacy. When used as a way to give back through service learning and volunteering, community engagement

and outreach aims at improving social responsibility and citizenship skills with hopes of Aggies continuing to have greater involvement in community engagement after graduation.

Education Abroad and National Student Exchange provides Aggies an exciting opportunity to continue their education inside and outside of the continental U.S. Studying abroad is great way to learn in an immersive environment as is studying in other areas in the U.S. through National Student Exchange. It is so much more than what students learn in a classroom. Education abroad gives students the opportunity to take classes in a new context as well as provides the opportunity for students to learn and understand different cultures and nationalities. Students who take advantage of education abroad experience academic and personal growth. The Office of Experiential Learning also provides students with an on campus Passport Acceptance Facility Office which provides ease of access to obtain a U. S. Passport to experience the world abroad.

Our goal is to continue to research and introduce innovative initiatives that will offer increased opportunities for Aggies to attain well-rounded experience. For more information about services offered by the Office of Experiential Learning, please call (575) 646-1631.

Office of Student Involvement and Leadership Programs (SILP)

The Office of Student Involvement and Leadership Programs (SILP) supports student success and offers involvement outside the classroom. SILP collaborates with campus and community entities to create opportunities for student engagement, individual and group leadership development, and a wide variety of campus traditions including Fort Keystone, Crimson Kickoff, and Noche de Luminarias. SILP staff train and support recognized student organizations on topics ranging from event planning to personal and professional development to funding and fiscal responsibility, manages the recognition and event registration processes, and helps all students determine where and how they can get involved at NMSU through Crimson Connection.

Areas contained within SILP include ASNMSU, Fraternity and Sorority Life, Leadership, Engagement, & Traditions, and Student Media (KRUX 91.5FM and The Round Up), as well as administrative support for all other 200+ student organizations.

Parking Office

NMSU requires a parking permit to park in campus parking lots or curbside on streets. Parking meters require payment. Free parking is available near the Pan American Center. Parking regulations are enforced 24 hours a day with the exception of a required permit between the hours of 7:30am - 4:30pm. Disabled parking spaces, emergency/fire zones, service zones, yellow curbs and permitted housing areas are enforced 24 hours a day. The campus parking map and Parking Regulations are available at park.nmsu.edu (<http://park.nmsu.edu>).

Information on purchasing a parking permit is also available by phone at 575-646-2306, by emailing parking@nmsu.edu, online at park.nmsu.edu (<http://park.nmsu.edu>) or at the Parking Department located on the second floor of the NMSU Bookstore Monday through Friday from 8am- 4:00pm. All parking permits must be purchased online at <https://park.nmsu.edu/permits-placards/online.html>.

When visiting the Parking & ID Services office, you may park for free in designated spots just south of the building. Aggie Transit is a free

campus shuttle service available to all students. Bus route maps are available at park.nmsu.edu (<http://park.nmsu.edu>).

Transportation and Parking Services is responsible for issuing parking permits, developing parking lots as well as maintaining information related to the university fleet.

NMSU Police Department is responsible for enforcing NMSU parking regulations.

Disability Access Services

In compliance with the federal regulations outlined in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 2008, NMSU is committed to providing accommodations and academic adjustments to ensure equal access for students with disabilities. Students who wish to request an accommodation or academic adjustment for face-to-face and online classes, practicums and internships must follow the established procedures for self-identification by completing the application and interactive process with Disability Access Services (DAS). Our office also receives and processes housing accommodation determinations for students residing in student housing. Our office also provides test proctoring services through our testing center and offers a student resource area for studying and networking with other students on campus.

To submit an application for accommodations or for more information, please visit our website or come by the DAS office in Corbett Center Student Union:

Room. 204
MSC 4149, PO Box 30001
Las Cruces, NM 88003-0001
(575) 646-6840
Email: das@nmsu.edu
<http://das.nmsu.edu>

Student Success Centers

The Student Success Center provides services to assist NMSU students in reaching their academic potential. The Student Success Center provides study skills assistance in such areas as: time management; memory; concentration; note taking; reading; test preparation; test taking; speed reading; critical thinking; financial wellness, as well as graduate school preparation. In addition, the Student Success Center provides career-focused services such as resume/cover letter reviews, mock interviews, and assistance with completing Handshake profiles. The services are available to students in the following formats:

1. Individualized consultations are provided to any student who walks in at the Student Success Center
2. Learning strategies, study-skills and career-focused workshops provide quick assistance in one-hour presentations offered throughout the semester.
3. Professional and graduate school workshops provide development in such areas as speed reading, preparing for graduate school, preparing for the GRE Test.
4. Student Success Center staff provide outreach presentations on learning, study-skills and career-focused topics to classes, programs and organizations on campus.
5. Individual and group financial wellness services are provided through the Nusenda Center for Financial Capability which is housed in the Student Success Center.

For comprehensive information on all programs and services offered by the Student Success Center please visit us at the Hardman and Jacobs Undergraduate Learning Center Room 128, call (575) 646-3136, or review our services online at <http://ssc.nmsu.edu>.

Testing Services

Testing Services provides test information and registration materials for the following tests:

- American College Testing Assessment (ACT);
- College Level Examination Program (CLEP);
- High School Equivalency (HSE) (GED/HiSET);
- Graduate Record Exam (GRE);
- Miller Analogies Test (MAT);
- Pearson VUE Test Site;
- PRAXIS Series;
- Pre-Professional Skills Test (PPST);
- New Mexico Teacher Assessments;
- and others.
- Test of English as a Foreign Language (TOEFL)

For more information contact:

Testing Services

MSC 3DA, PO Box 30001

Las Cruces, NM 88003

Phone: (575) 527-7569

<https://dacc.nmsu.edu/testing> (<https://dacc.nmsu.edu/student-services/admissions/testing-services.html>)

TRIO Student Support Services Program

The TRIO Student Support Services program offers academic and social support to ensure that program participants succeed at New Mexico State University. TRIO SSS uses a holistic approach in providing essential services to participants. Services include tutoring, mentoring, and strategies to assist participants in reaching their academic potential. Tutors and Mentors are certified by the College Reading and Learning Association and assist participants with tutoring, developing study strategies, adjusting to college, learning and using campus resources, developing effective study skills, accessing financial aid, using academic peer pre-advising, staying motivated and dealing with personal issues associated with college.

To qualify for the program, students must be a first generation college student (neither parent received a four-year baccalaureate degree), meet income guidelines set by the US Department of Education, demonstrate an academic need or have a learning or physical disability. Admission to the TRIO Student Support Services is highly competitive with only 350 slots available for eligible students.

For comprehensive information regarding services offered by the TRIO Student Support Services Program please visit at the Student Success Center located in the Hardman and Jacobs Undergraduate Learning Center Room 128, call (575) 646-1336, or visit our website at <http://triosss.nmsu.edu>

Undergraduate Research Programs

New Mexico State University has a variety of faculty-mentored undergraduate research opportunities through which students demonstrate knowledge gained within the classroom and apply it to

scholarly research projects. As a part of the curriculum, students may work individually with a faculty member on an independent study project or Honors capstone project; in some majors, course-based undergraduate research experience courses, or CURE courses, prepare students for advanced research projects. The following NMSU programs engage undergraduates in faculty-mentored research:

- Avian Migration Research Program
- Arts & Sciences Discovery Scholars Program
- Enhancement Research Program in Ecological Sciences
- Fred Hutchinson Partnership for the Advancement of Cancer Research Project (PACR)
- iCREDITS Center for Smartgrid Technologies
- Maximizing Access to Research Careers (MARC)
- McNair Post-Baccalaureate Achievement Program
- New Mexico Alliance for Minority Participation (AMP)
- New Mexico Space Grant Consortium
- NM IDeA Network for Biomedical Research Excellence (INBRE)
- NSF-REU: BIG Data Analytics for Cyber-Physical Systems
- NSF-REU: Immigration Policy and US-Mexico Border Communities
- NSF-REU: Jornada Basin Long-Term Ecological Research

Additional support for undergraduate researchers is available through the Aggie Innovation Space & Workshop and the Center for Undergraduate Research and Creative Activity (CURCA). Undergraduate students seeking guidance on how to engage with the research, scholarship, and creative work of the university are encouraged to contact the Center for Undergraduate Research and Creativity at <https://honors.nmsu.edu/curca.html>.

The NMSU Community Colleges

Chancellor • TBD

Branch Executive Director • Kenneth Van Winkle

President NMSU-Doña Ana • Monica Torres

NMSU's Community College campuses make two years of college education available to students in their home environment. The community colleges provide a high quality program of education for all full-time and part-time students; provide occupational education; and provide noncredit community education courses.

A student attending any NMSU Community College campus is enrolled as a New Mexico State University student and may change campuses without completing additional admission procedures.

Associate Degree Graduation Requirements

Associate degree programs are offered at the NMSU Community College campuses for those desiring specialized training for employment. Community, junior, and technical college transfer students may be admitted and classified on the basis of acceptable credits at two-year institutions. The Associate in prebusiness degree, administered by the College of Business, is available to NMSU Community College campus students completing the requirements as outlined in the "College of Business" section of this catalog. Most courses required for the Associate in Applied Science degree with options in electronics technology offered at the Grants and Alamogordo campuses meet

lower division requirements for the baccalaureate degree program in Electronics Engineering Technology, which is offered on the Las Cruces campus through the College of Engineering.

Math requirements in associate degree and certificate programs vary. ENGL 1110G Composition I and all developmental studies courses in English, math and reading must be completed with a grade of C- or better. Please refer to your NMSU Community College campus catalog for details. The last 15 semester credits for an associate degree must be taken in residence at NMSU or one of the NMSU Community Colleges. Degree requirements remain in effect for six years. The designation, Meritorious Graduate, is awarded to the top 15 percent of the students receiving associate degrees within each college in any one academic year, provided 45 or more credits have been completed at NMSU and/or a NMSU Community College with computable grades.

Certificate Programs

In addition to the regular degree programs offered by the NMSU Community College campuses, certificate programs are available. Students should contact the NMSU Community College campus for information on available certificate programs.

NMSU Community College Campus Information

Information concerning NMSU Community College campus programs, class schedules, catalogs, registration and other data may be obtained from the NMSU Community College campus administration.

Kenneth Van Winkle, Branch Executive Director NMSU-Alamogordo Community College

2400 N. Scenic Dr.
Alamogordo, New Mexico 88310
Alamogordo Course Catalog
(575) 439-3696

Monica Torres, President NMSU-Doña Ana Community College

Box 30001, Dept. 3DA
Las Cruces, New Mexico 88003
Dona Ana Course Catalog
(575) 527-7510

Kenneth Van Winkle, Branch Executive Director NMSU-Grants Community College

1500 Third Street
Grants, New Mexico 87020
Grants Course Catalog
(505) 287-6678

Recognition of Academic Achievement

NMSU has a number of university-wide programs that recognize academic achievement. These include

- the Honors College,
- the Crimson Scholars Program,
- the dean's report of academic achievement and
- graduation with honors.

In addition, many colleges and departments have their own programs and awards that recognize the academic achievement of their students.

The Honors College

The Honors College provides motivated undergraduate students with opportunities to broaden and enrich their academic programs. In small classes taught by master teachers, honors students engage in lively discussion and collaborative investigation of interdisciplinary topics. By taking honors courses, students may also work toward completing general education requirements and disciplinary requirements in the major. There are two program options available to students: University Honors and the Honors Certificate. Each option has separate eligibility requirements, benefits, and forms of recognition for the student. For details concerning eligibility and requirements, see the Honors College (p. 1319) section of the catalog.

Crimson Scholars Program

Crimson Scholars is a recognition program for academically superior students who achieve and maintain a Grade Point Average (GPA) of 3.5 or better. Crimson Scholars receive a number of benefits, including:

- Automatic eligibility for all Honors courses
- Early registration
- Recognition in the commencement program
- Regalia for Commencement that acknowledges the Crimson Scholar designation
- Permission to live in the Honors Residential Community

For eligibility criteria, see the Honors College (p. 1319) section of the catalog.

Dean's Report of Academic Achievement

Following the close of the semester, each college dean publishes a list of students who have achieved honor standing in grades for the previous semester. To be eligible, a student must have been enrolled in 12 or more semester credits with a computable grade in each. The top 15 percent of eligible students by college for that semester will be named to the Dean's Honor List.

Graduation with Honors

To be eligible for a four-year degree with honors, a student must have earned at least 60 semester credits in computable grades while in residence at New Mexico State. Courses taken in the Honors College and graded S will be counted as a part of the minimum of 60 credits. The number of students at graduation, by college, receiving degrees with honors in any one year shall not exceed 15 percent. To receive high honors, a student must be in the top 1.5 percent of the graduating class by college. One person from each college will receive highest honors. In case of a tie, the student with the greatest numbers of credits earned at NMSU with computable grades will be awarded highest honors for each college. Of the students receiving highest honors from the fall and spring commencements, the student with the highest grade-point average and the greatest number of credits earned at NMSU with computable grades will be awarded the Class of 1919 Scholarship Plaque.

Course Listings

New Mexico State University is currently undergoing a renumbering initiative to align with a State regulatory change. While this process is

occurring courses will appear in two ways, a four-digit number or a three-digit number.

Course Numbering:

Four-digit Course

ASTR 1120G The Planets Lecture & Laboratory (4 credits (3+3P))

- **Course Prefix-** the four letter code that represents the subject of the course and where the course can be located in the Courses A-Z list below.
- **Course number-** (1120) indicates the course is a freshman course.
- **Course Title-** will appear after the prefix and number
- **Suffix-** will appear at the end of the number
 - *Suffix (G)-* indicates a New Mexico statewide General Education course.
 - *Suffix (V)-* indicates a Viewing a Wider World course.
 - *Suffix (H)-* indicates a Honors courses outside of the Honors prefix.
 - *Suffix (L)-* indicates a Laboratory course.
 - *Suffix (M)-* indicates a Multicultural course.
- **Credits -** The unit of university credit is the semester hour. In the example the course can be taken and will be charged for 4 credits. The numbers that appear in the parenthesis indicate the number of credits for lecture hours (3) and the number of credits for practicum/ laboratory hours (3).

Three-digit Course

AERT 105 Aerospace Engineering PLTW (4 credits (2+4P))

- **Course Prefix-** the four letter code that represents the subject of the course and where the course can be located in the Courses A-Z list below.
- **Course number-** (105) indicates the course is a freshman course.
- **Course Title-** will appear after the prefix and number
- **Suffix-** will appear at the end of the number
 - *Suffix (G)-* indicates a New Mexico statewide General Education course.
 - *Suffix (V)-* indicates a Viewing a Wider World course.
 - *Suffix (H)-* indicates a Honors courses outside of the Honors prefix.
 - *Suffix (L)-* indicates a Laboratory course.
 - *Suffix (M)-* indicates a Multicultural course.
 - *Suffix (N) -* indicates when the course credits are not applicable to the baccalaureate and specified associate degrees and is only added to developmental coursework.
- **Credits -** The unit of university credit is the semester hour. In the example the course can be taken and will be charged for 4 credits. The numbers that appear in the parenthesis indicate the number of credits for lecture hours (2) and the number of credits for practicum/ laboratory hours (4).

Designation

- 100-299/1000-2999 – Lower Division (Las Cruces and Community College Campuses)
- 300-499/3000-4999 – Upper Division (Las Cruces Campus)

- 450-499/4500-4999 – Senior and graduate courses (Las Cruces Campus)
- 500-799/5000-7999 – Graduate courses (Las Cruces Campus)

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

Course Descriptions:

The course description will follow the prefix, number and credit hours. The description will explain what the course entails and will display any restrictions that the course may have that will be enforced during the registration process.

ASTR 1115G. Introduction Astro (lec+lab)

4 Credits (3+2P)

This course surveys observations, theories, and methods of modern astronomy. The course is predominantly for non-science majors, aiming to provide a conceptual understanding of the universe and the basic physics that governs it. Due to the broad coverage of this course, the specific topics and concepts treated may vary. Commonly presented subjects include the general movements of the sky and history of astronomy, followed by an introduction to basic physics concepts like Newton's and Kepler's laws of motion. The course may also provide modern details and facts about celestial bodies in our solar system, as well as differentiation between them – Terrestrial and Jovian planets, exoplanets, the practical meaning of “dwarf planets”, asteroids, comets, and Kuiper Belt and Trans-Neptunian Objects. Beyond this we may study stars and galaxies, star clusters, nebulae, black holes, and clusters of galaxies. Finally, we may study cosmology—the structure and history of the universe. The lab component of this course includes hands-on exercises that work to reinforce concepts covered in the lecture, and may include additional components that introduce students to the night sky.

A

- A E-AEROSPACE ENGINEERING (p. 1333)
- A EN-AGRICULTURAL ENGINEERING (p. 1335)
- A ST- APPLIED STATISTICS (p. 1336)
- ACCT-ACCOUNTING (p. 1339)
- ACES-AGRI, CONSUMER & ENV SCIE (p. 1341)
- ACOM-AG COMMUNICATIONS (p. 1342)
- AEEC-AGRICULTURAL ECON/ECON (p. 1345)
- AERO-AEROSPACE STUDIES (p. 1351)
- AERT-AEROSPACE TECHNOLOGY (p. 1352)
- AFST-AFRICANA STUDIES (p. 1354)
- AGRO-AGRONOMY (p. 1355)
- AHS-ALLIED HEALTH SCIENCE (p. 1357)
- ANSC-ANIMAL SCIENCE (p. 1358)
- ANTH-ANTHROPOLOGY (p. 1364)
- ARCH-ARCHITECTURE (p. 1380)
- ARSC-ARTS & SCIENCES (p. 1385)
- ARTH-ART HISTORY (p. 1386)
- ARTS-ART STUDIO (p. 1391)
- ASTR-ASTRONOMY (p. 1402)

- AUTO-AUTOMOTIVE TECHNOLOGY (p. 1405)
- AXED-AGRICULTURAL EXTN EDUC (p. 1409)

B

- B A-BUSINESS ADMINISTRATION (p. 1413)
- BCHE-BIOCHEMISTRY (p. 1414)
- BCIS-BUSINESS COMPUTER SYSTEMS (p. 1416)
- BCT-BUILDING CONSTRUCTION TECH (p. 1419)
- BEST-BORDERLAND & ETHNIC STUDIES (p. 1421)
- BFIN-BUSINESS FINANCE (p. 1424)
- BIOL-BIOLOGY (p. 1427)
- BLAW-BUSINESS LAW (p. 1438)
- BLED-BILINGUAL EDUCATION (p. 1440)
- BMGT-BUSINESS MANAGEMENT (p. 1445)
- BUSA-BUSINESS ADMINISTRATION (p. 1447)

C

- C E-CIVIL ENGINEERING (p. 1448)
- C S-COMPUTER SCIENCE (p. 1453)
- CAST-CHILD ADVOCACY STUDIES (p. 1471)
- CCDE-DEVELOPMENTAL ENGLISH (p. 1472)
- CCDM-DEVELOPMENTAL MATHEMATICS (p. 1473)
- CCDD-DEVELOPMENTAL READING (p. 1473)
- CCDS-DEVELOPMENTAL SKILLS (p. 1473)
- CCST-CHICANA/O STUDIES (p. 1474)
- CEPY-COUNSELING & EDUCATIONAL PSYCHOLOGY (p. 1475)
- CHEF-CULINARY ARTS (p. 1498)
- CHEM-CHEMISTRY (p. 1499)
- CHIN-CHINESE (p. 1508)
- CHME-CHEMICAL & MATERIALS ENGR (p. 1510)
- CHSS - COMM HEALTH/SOC SRVCS (p. 1519)
- CJUS-CRIMINAL JUSTICE (p. 1520)
- COMM-COMMUNICATION (p. 1526)
- CSEC-CYBERSECURITY (p. 1533)
- CTEC-CYBER TECHNOLOGY (p. 1534)
- CTFM-CLTHNG/TXTLS/FSHN MRCHDSG (p. 1536)

D

- DANC-DANCE (p. 1538)
- DAS-DENTAL ASSISTING (p. 1545)
- DHYG-DENTAL HYGIENE/HYGIENIST (p. 1546)
- DMS-DIAGNOSTIC MED SONOGRAPHY (p. 1547)
- DRFT-DRAFTING (p. 1550)

E

- E E-ELECTRICAL ENGINEERING (p. 1554)
- E T-ENGINEERING TECHNOLOGY (p. 1568)
- ECDV-ECONOMIC DEVELOPMENT (p. 1582)
- ECED-EARLY CHILDHOOD EDUCATION (p. 1583)
- ECON-ECONOMICS (p. 1599)
- EDLT-EDUCATION (p. 1602)
- EDUC-EDUCATION (p. 1605)

- ELAD-EDUCATIONAL LEADERSHIP ADMINISTRATION (p. 1617)
- ELT - ELECTRONICS TECHNOLOGY (p. 1624)
- ELWK-ELECTRICAL LINEWORK (p. 1625)
- ENGL-ENGLISH (p. 1626)
- ENGR-ENGINEERING (p. 1640)
- ENTR-ENTREPRENEURSHIP AND INNOVATION (p. 1644)
- ENVE-ENVIRONMENTAL ENGINEERING (p. 1644)
- ENVS-ENVIRONMENTAL SCIENCE (p. 1645)
- EPWS-ETMLGY/PLNT PTHLGY/WD SCI (p. 1647)

F

- FCSC-FAMILY & CONSUMER SCI (p. 1650)
- FCST-FAMILY AND CHILD STUDIES (p. 1652)
- FDMA-FILM & DIGITAL MEDIA ARTS (p. 1654)
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G

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H

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I

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M

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P

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T

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U

- UNIV-UNIVERSITY STUDIES (p. 1987)

W

- WATR-WATER UTILITIES (p. 1987)
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- WSAM-WATER SCIENCE & MGT (p. 1990)

A E-AEROSPACE ENGINEERING

A E 339. Aerodynamics I

3 Credits (3)

Fluid properties, conservation equations, incompressible 2-dimensional flow; Bernoulli's equation; similarity parameters; subsonic aerodynamics: lift and drag, analysis and design of airfoils. May be repeated up to 3 credits.

Prerequisite: C- or better grades in ENGR 234 and (M E 228 or MATH 392).

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to design and conduct experiments, as well as to analyze and interpret data;
3. Ability to design a system, component or process to meet desired needs within realistic constraints;
4. Ability to identify, formulate, and solve engineering problems.

A E 362. Orbital Mechanics**3 Credits (3)**

Dynamics of exoatmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 392), ENGR 234, and M E 261.

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to identify, formulate, and solve engineering problems;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

A E 363. Aerospace Structures**3 Credits (3)**

Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques. May be repeated up to 3 credits.

Prerequisite: C- or better grades in C E 301.

Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

A E 364. Flight Dynamics and Controls**3 Credits (3)**

Fundamentals of airplane flight dynamics, static trim, and stability; spacecraft and missile six degree of freedom dynamics; attitude control of spacecraft. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 392), ENGR 234, and M E 261.

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to identify, formulate, and solve engineering problems;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

A E 400. Undergraduate Research**1-3 Credits (1-3)**

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisite(s): Consent of faculty member.

A E 405. Special Topics**3 Credits (3)**

Topics of modern interest to be offered by the departmental staff. Consent of instructor required.

A E 419. Propulsion**3 Credits (3)**

Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in A E 439.

Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

A E 424. Aerospace Systems Engineering**3 Credits (3)**

Basic principles of top down systems engineering and current practice; preliminary and detailed design of aircraft and space vehicles, including requirement, subsystem interaction, and integration, tradeoffs, constraints and non-technical aspects. May be repeated up to 3 credits.

Prerequisite: C- or better grades in A E 362.

Learning Outcomes

1. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
2. an ability to communicate effectively with a range of audiences
3. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
4. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

A E 428. Aerospace Capstone Design**3 Credits (3+2P)**

Team Project-analysis, design, hands-on build test, evaluate.

Prerequisite(s)/Corequisite(s): A E 447. Prerequisite(s): A E 363 and A E 424.

A E 439. Aerodynamics II**3 Credits (3)**

Principles of compressible flow, momentum and energy conservation; thermal properties of fluids; supersonic flow and shock waves; basics of supersonic aerodynamics. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (A E 339 or M E 338), M E 240, and M E 328.

Learning Outcomes

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

A E 447. Aerofluids Laboratory**3 Credits (2+3P)**

Use of subsonic wind tunnels and other flow to study basic flow phenomena and methods of fluid measurement and visualization.

Prerequisite(s)/Corequisite(s): A E 439. Prerequisite(s): M E 345.

A E 451. Aircraft Design**3 Credits (3)**

Conceptual design of aircraft based on existing designs, empirical relationships, and theory. Dimensioning, structural design, and performance analysis of major subcomponents such as fuselage, wing, and propulsion system. Static stability and control analysis.

Prerequisite(s): A E 339 and A E 363.

A E 452. Control System Design**3 Credits (3)**

Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.

Prerequisite: M E 261, M E 328 and ENGR 234.

Learning Outcomes

1. Construct a block diagram to find a transfer function for a dynamical system;
2. Analyze control systems by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques;
3. Design and simulate automatic control systems for mechanical and aerospace engineering applications.

A E 464. Advanced Flight Dynamics and Controls**3 Credits (3)**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile/rocket control systems, and guidance systems.

Prerequisite(s): A E 364 or consent of instructor.

A E 509. Individualized Study**3 Credits (3)**

Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to A E & M E majors.

A E 510. Special Topics**1-6 Credits (1-6)**

Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.

A E 527. Linear Systems Theory**3 Credits (3)**

Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer. May be repeated up to 3 credits.

Learning Outcomes

1. Students are able to design linear multi-input-multi-output (MIMO) control systems.

A E 533. Numerical Methods for Computational Fluid Mechanics and Heat Transfer**3 Credits (3)**

Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data. May be repeated up to 3 credits.

Prerequisite: M E 530.

Learning Outcomes

1. An ability to apply fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior.

A E 564. Advanced Flight Dynamics and Controls**3 Credits (3)**

Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile / rocket control systems, and guidance systems May be repeated up to 3 credits.

Prerequisite(s): A E 364 or consent of instructor.

A E 598. Special Research Programs**1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to A E & M E majors.

A E 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. Graded: Thesis/Dissertation.

A E 600. Doctoral Research**1-15 Credits (1-15)**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Dissertation.

A E 700. Doctoral Dissertation**15 Credits (15)**

Dissertation. Graded: Thesis/Dissertation.

A EN-AGRICULTURAL ENGINEERING

A EN 459. Groundwater, Wells & Pumps**3 Credits (3)**

Occurrence and movement of groundwater; design of water wells; selection and specification of pumps and power units. May be repeated up to 3 credits.

Prerequisite: C E 382 or consent of instructor.

Learning Outcomes

1. Understand the occurrence and movement of groundwater in aquifers, and extraction of it.
2. Ability to interpret pump specifications and data.
3. Select and detail power units for pumping systems.

A EN 478. Irrigation and Drainage Engineering**3 Credits (2+3P)**

Design and operation of surface and sprinkler irrigation systems; pumping and conveyances; introduction to principles and practices of drainage systems and wells.

Prerequisite: C E 382 or consent of instructor.

A EN 498. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

A ST- APPLIED STATISTICS

A ST 311. Statistical Applications

3 Credits (3)

Techniques for describing and analyzing economic and biological data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. May be repeated up to 3 credits.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Describe a data set with graphical tools and computed measures.
2. Explain the relationship between two numerical variables using correlation and regression.
3. Understand how probability and sampling methods are used to make statistical inferences.
4. Draw inference from a sample to a population using confidence intervals and hypothesis tests.
5. Understand the relationship between population parameters and sample statistics.
6. Understand the basic procedure of data production with sampling and experimental design.

A ST 450. Special Topics

1-4 Credits

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

A ST 465. Statistical Analysis I

3 Credits (3)

An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, testing, and simulation. Crosslisted with: A ST 565.

Prerequisite(s): MATH 2530G or consent of instructor.

A ST 466. Statistical Analysis II

3 Credits (2+2P)

Continuation of A ST 465. An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, testing, and simulation. Crosslisted with: A ST 566.

Prerequisite(s): A ST 465 or consent of instructor.

A ST 498. Independent Study

1-3 Credits

Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.

A ST 503. SAS Basics

3 Credits (2+2P)

An introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily PC/SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures.

Corequisite(s): A ST 505.

A ST 504. Statistical Software Applications

1 Credit (1)

Optional Computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506.

Prerequisite(s): A ST 503.

Corequisite(s): A ST 506.

A ST 505. Statistical Inference I

4 Credits (3+2P)

A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, and testing. One-way analysis of variance. Simple linear regression.

Prerequisite: consent of the instructor.

A ST 506. Statistical Inference II

3 Credits (2+2P)

Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots. May be repeated up to 3 credits.

Prerequisite: A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.

Learning Outcomes

1. Formulate models, construct ANOVA tables for balanced designs, and conduct complete analyses accounting for factorial treatment structures, and standard experimental design structures, including the completely randomized design, the randomized complete block design, completely randomized design with subsampling, the completely randomized design with a covariate, and the split-plot design.
2. Assess model adequacy including assessing constancy of variance and normality assumptions.
3. Choose an appropriate multiple comparisons procedure to control the experiment wise or family wise Type I error rate.
4. Use contrasts to conduct pre-planned comparisons.
5. Identify the experimental unit(s) in an experiment; formulate a model and conduct an analysis appropriately accounting for the experimental unit(s).
6. Conduct a complete analysis of data from a designed experiment and interpret findings.

A ST 507. Advanced Regression

3 Credits (3)

Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models. May be repeated up to 3 credits.

Prerequisite: A ST 503 and A ST 505 or consent of instructor.

Learning Outcomes

1. Understand the fundamental philosophy behind regression.
2. Conduct a proper regression analysis, including making inferences and predictions.
3. Address common pitfalls in regression, including model assumption and collinearity issues.
4. Use the R language to perform regression analysis.

A ST 509. Statistical Models for Complex Data Structures**3 Credits (3)**

Statistical models for data that are not normally distributed or data with correlated observations. Covers generalized linear models for discrete and mixed models for correlated data structures. Analysis of data with unbalanced and missing cells.

Prerequisite: A ST 506 with a grade of B or higher, or A ST 507 with a grade of B or higher.

Learning Outcomes

1. Analyze data using classical regression and generalized linear models.
2. Derive quantities of interest from fitted models.
3. Formulate the appropriate hierarchical model for different analytical goals and data structures.
4. Use statistical software to fit hierarchical models and assess the adequacy of the model.
5. Interpret summaries of fitted hierarchical models.

A ST 511. Statistical Methods for Data Analytics**3 Credits (3)**

Statistics fundamentals, with an emphasis on inferential methods, linear regression, and practical applications to data analytics. A ST majors should not take this course if they have already completed A ST 505.

Learning Outcomes

1. Understand descriptive and inferential methods commonly used in data analytics
2. Formulate linear regression models and fit models using statistical software
3. Properly interpret the results of statistical analyses
4. Effectively communicate statistical methods and results orally and in writing

A ST 512. Quantitative Analysis for Business Decisions**3 Credits (3)**

Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making. Crosslisted with: MGMT 512.

Learning Outcomes

1. Understand statistical methods commonly used in business.
2. Identify statistical considerations in the design of studies.
3. Properly interpret the results of statistical analyses and use results to make decisions regarding business problems.
4. Effectively communicate business decisions orally and in writing, using statistics to defend decisions, as appropriate.

A ST 515. Statistical Analysis with R**3 Credits (3)**

Introduction to R data types, basic calculations and programming, data input and manipulation, one and two sample tests, ANOVA, regression, diagnostics, graphics, probability distributions, and basic simulations in the R software environment.

Prerequisite(s): A ST 505 or equivalent with consent of instructor.

A ST 540. Predictive Analytics**3 Credits (3)**

This course covers data analytic techniques that can be used to predict and classify observations outside of the original data. Material includes linear and nonlinear regression models, linear and nonlinear classification models, and classification and regression trees. Students will gain hands-on experience using modern software packages to build predictive models and quantify the accuracy of these models.

Prerequisite(s): A ST 507 or consent of instructor.

A ST 550. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

A ST 551. Introduction to Statistical Consulting**1 Credit (1)**

Consideration of published material in the consulting process. Restricted to majors. Graded S/U.

Prerequisite: consent of instructor.

A ST 552. Advanced Statistical Consulting**1 Credit (1)**

Continuation of A ST 551 with emphasis on dealing with clients in order to identify statistically relevant features of a research study. Restricted to majors. Graded S/U.

Prerequisite: A ST 551.

A ST 553. Practicum in Statistical Consulting**1 Credit (1)**

Supervised experience under the guidance of senior faculty. May be repeated for a maximum of 2 credits. Restricted to majors. Graded S/U.

Prerequisite: A ST 552.

A ST 554. Practicum in Statistics**3 Credits (3)**

Practical experience in data analysis and the reporting of results; selecting and using statistical methods to analyze and interpret real-world problems; written and oral communication of findings

Prerequisite: A ST 503, A ST 506, A ST 507, and A ST 566.

Learning Outcomes

1. Work with real data to gain substantial experience in data analysis, writing, and presentation.
2. Research and apply a variety of statistical methods, some of which students may not have encountered in prior coursework.
3. Apply knowledge and skills gained throughout the program of study, integrating content from across the MS in A ST curriculum.

A ST 555. Applied Multivariate Analysis**3 Credits (3)**

Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques. May be repeated up to 3 credits.

Prerequisite: A ST 506 and A ST 504.

Learning Outcomes

1. Understand the details of various multivariate techniques, emphasizing connections to univariate techniques where applicable.
2. Select appropriate multivariate techniques for a given data set and problem.
3. Use statistical software to perform multivariate analyses.
4. Correctly interpret, write about, and present the results of multivariate analyses.

A ST 565. Statistical Analysis I**3 Credits (3)**

An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z , t , x^2 , F), estimation, testing, and simulation. Crosslisted with: A ST 465.

Prerequisite(s): MATH 2530G or consent of instructor.

A ST 566. Statistical Analysis II**3 Credits (2+2P)**

Continuation of A ST 565. Crosslisted with: A ST 466.

Prerequisite(s): A ST 565 or consent of instructor.

A ST 567. Applied Linear Models I**3 Credits (3)**

The mean model, including constraints, approach to linear models; nonidentity variance-covariance matrices. Some emphasis on computational aspects and relation to statistical packages.

Prerequisite: A ST 566 or consent of instructor.

A ST 568. Applied Linear Models II**3 Credits (3)**

The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects.

Prerequisite: A ST 567.

A ST 596. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval by department head. May be repeated for a maximum of 3 credits.

Prerequisite: consent of instructor.

A ST 598. Special Research Problems**1-6 Credits**

Individual analytical or experimental projects. Restricted to majors. Graded S/U.

A ST 599. Master's Thesis**1-6 Credits**

Thesis.

A ST 609. Linear Model Theory**3 Credits (3)**

Theoretical treatment of linear models. Covers fixed effects and mixed effects models; models that are full rank, less than full rank, and over-parametrized. Some computational aspects are discussed in relation to statistical packages. Prior to enrollment students should have a basic understanding of undergraduate-level matrix algebra.

Prerequisite: A ST 565, A ST 566, and A ST 509.

Learning Outcomes

1. Derive estimators of model parameters using design matrices, including models that are full rank, less than full rank, and over-parameterized
2. Derive the expectation vector and variance matrix of a linear transformation of a random data vector
3. Derive common test statistics and their distributions for fixed effects and mixed effects models with a balanced design
4. Understand the mathematical properties of variance-covariance matrices and their implications for model estimation and inference
5. Derive and interpret diagnostics for linear models

A ST 616. Computational Statistics**3 Credits (3)**

An introduction to topics in computational statistics including: methods for generating random variables, large scale hypothesis testing, resampling, bootstrapping, permutation tests, the Expectation-Maximization algorithm, Markov chain Monte Carlo methods, and computational approaches in Bayesian inference. Includes some applications of computational statistics in the sciences. Previous experience with programming, while helpful, is not required.

Prerequisite: A ST 505 and A ST 566.

Learning Outcomes

1. Conduct large-scale hypothesis testing
2. Generate random numbers and random variables
3. Implement Markov chain Monte Carlo methods for conducting Bayesian inference
4. Import and manipulate data using R
5. Employ bootstrapping methods for making inferences and conduct statistical hypothesis testing using permutation tests

A ST 645. Time Series Methods**3 Credits (3)**

Theory and methods for analyzing, modeling, and forecasting time series. Covers ARIMA models, spectral analysis, filtering, and state-space models. Previous experience using the R programming language is helpful but not required. Students should have a basic understanding of undergraduate-level matrix algebra and trigonometry.

Prerequisite: A ST 565 and A ST 507.

Learning Outcomes

1. Explore time series datasets for autocorrelation, cross-correlation, and stationarity
2. Select appropriate models for analyzing and forecasting time series data
3. Identify regular patterns and frequencies in time series data
4. Fit time series models using statistical software
5. Understand mathematical theory underlying time series models

A ST 665. Bayesian Theory**3 Credits (3)**

Provides an overview of theory underlying Bayesian inference. Topics include Likelihood and Sufficiency Principles, concepts from decision theory, construction of prior distributions, Bayesian point estimation, tests and confidence regions.

Prerequisite: A ST 565 and A ST 566.

Learning Outcomes

1. Understand the theoretical justification for using Bayesian methods as a means of statistical inference
2. Apply decision-theoretic principles to evaluate estimators under different loss functions
3. Develop prior distributions using the concepts of entropy, conjugacy, and non-informativeness
4. Derive basic point estimators using Bayesian principles
5. Understand testing and confidence region methods used for Bayesian inference

A ST 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation for the Applied Statistics doctoral program. Students must have advancement to candidacy in order to enroll in this course. May be repeated up to 36 credits.

Learning Outcomes

1. Make substantive progress towards completing a dissertation that fulfills the requirements for the Applied Statistics doctoral degree.

ACCT-ACCOUNTING

ACCT 101. Supplemental Instruction to ACCT 221**1 Credit (1)**

Collaborative workshop for students in ACCT 221 – Financial Accounting. Course does not count toward departmental degree requirements. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

Corequisite(s): ACCT 221.

ACCT 200. A Survey of Accounting**3 Credits (3)**

Emphasis on financial statement interpretation and development of accounting information for management. For engineering, computer science, and other non business majors. Community Colleges only.

Prerequisite: one C S course or consent of instructor.

ACCT 2110. Principles of Accounting I**3 Credits (3)**

An introduction to financial accounting concepts emphasizing the analysis of business transactions in accordance with generally accepted accounting principles (GAAP), the effect of these transactions on the financial statements, financial analysis, and the interrelationships of the financial statements.

Learning Outcomes

1. Analyze business transactions, their effects on the financial statements and the interrelationships of the financial statements involving the following: Cash transactions; Receivables and Net Realizable Value; Operational Assets and Depreciation; Inventory; Current Liabilities; Long-term Liabilities
2. Define, identify and demonstrate the impact of adjusting entries on financial statements.
3. Explain and demonstrate the differences between cash and accrual basis accounting.
4. Define and identify generally accepted accounting principles.

ACCT 2120. Principles of Accounting II**3 Credits (3)**

An introduction to the use of accounting information in the management decision making processes of planning, implementing, and controlling business activities. In addition, the course will discuss the accumulation and classification of costs as well as demonstrate the difference between costing systems.

Prerequisite(s): ACCT 2110.

Learning Outcomes

1. Identify the differences between financial and managerial accounting.
2. Illustrate the accumulation of costs in cost accounting systems.
3. Describe the basic elements of the budgeting process, its objectives and budget preparation.
4. Define and classify cost behavior.
5. Perform cost-volume-profit analysis for decision-making.
6. Perform differential (incremental) analysis for business decision making.
7. Explain the cause of the variance and its effect on the income statement.
8. Explain and demonstrate the difference between traditional costing and activity-based costing.

ACCT 301. Financial Accounting I**3 Credits (3)**

Concepts, principles, and practices of financial accounting, stressing the determination of income and financial position. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 302. Financial Accounting II**3 Credits (3)**

A continuation of ACCT 301.

Prerequisite(s): C- or better in ACCT 301.

ACCT 351. Accounting Systems**3 Credits (3)**

Covers accounting information systems as processors of data for financial reporting and control of economic organizations.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 353. Cost Accounting**3 Credits (3)**

The development and use of cost accounting information for inventory valuation, income determination, and cost control. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 403. Federal Taxation I**3 Credits (3)**

Basic federal income tax laws; emphasis on determination of taxable income of individuals. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.

Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 451. Auditing Theory and Practices**3 Credits (3)**

Auditing standards, audit evidence, auditors reports and opinions, and professional responsibilities.

Prerequisite(s): ACCT 351 and C- or better in ACCT 302.

ACCT 455. Federal Taxation II**3 Credits (3)**

Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning.

Prerequisite(s): C- or better in ACCT 403 or consent of instructor.

ACCT 456. Accounting for Nonprofit Organizations**3 Credits (3)**

Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports.

Prerequisite(s): C- or better in ACCT 302.

ACCT 458. Accounting Data Analytics**3 Credits (3)**

Data Analytics in financial and managerial accounting and auditing. Restricted to: Accounting majors.

Prerequisite(s): C- or Better in ACCT 301, ACCT 302, and ACCT 351.

ACCT 460. Fraud Examination and Prevention**3 Credits (3)**

Covers business fraud as it is occurring in American society. Emphasis is on occupational fraud and financial statement fraud. Examines various types of fraud, its symptoms and effective investigation techniques. Effective fraud prevention measures are discussed throughout the course. Emphasizes case studies and the application of principles to actual fraud cases.

Prerequisites: a C- or better in ACCT 451 or concurrent enrollment.

ACCT 490. Selected Topics**1-3 Credits**

Current topics in accounting. Prerequisites vary according to the seminar offered. May be repeated for a maximum of 12 credits under different subtitles.

ACCT 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

ACCT 500. Concepts in Accounting**1 Credit (1)**

Development, interpretation, and use of accounting information for financing, investing, operating, and managerial decision making.

Prerequisite(s): Admitted to MBA program.

ACCT 503. Accounting for Managers**3 Credits (3)**

Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to MAcc students.

Prerequisite(s): B or better in both ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 510. Technical and Professional Communication for Accountants**3 Credits (3)**

Effective writing strategies for professional communications. Students will learn to write with a professional style and proper English usage and to work with a variety of technical and lay audiences. Emphasis on initiation, planning, composition, and evaluation of business and accounting workplace scenarios to develop communication skills used in a business environment. Restricted to: Master of Accountancy majors.

ACCT 530. Advanced Accounting**3 Credits (3)**

This course is designed to provide in-depth study of current financial accounting concepts related to business combinations, financial statement consolidations, and foreign currency transactions and translations. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 302 with a grade of C or better.

ACCT 544. Financial Statement Analysis and Valuation**3 Credits (3)**

Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Restricted to: Master of Accountancy majors.

Prerequisite(s): Acct 302; Graduate students only.

ACCT 550. Special Topics**3 Credits (3)**

Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting. Prerequisites vary according to topic being offered.

ACCT 551. Advanced Auditing Theory and Practice**3 Credits (3)**

Understanding and evaluating internal control in an EDP environment. Statistical sampling applications and current issues in auditing.

Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 451.

ACCT 555. Federal Tax Research**3 Credits (3)**

Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 403.

ACCT 559. Ethics and Professionalism in Accounting**3 Credits (3)**

Introduction to ethical reasoning, integrity, objectivity, independence, and professional accounting issues. Students will apply the concepts and theories to accounting-specific cases. Restricted to: Master of Accountancy majors.

Prerequisite(s): C or better in ACCT 451.

ACCT 560. Taxation of Corporations and Shareholders Advanced**3 Credits (3)**

Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 403.

ACCT 564. Financial Accounting Research**3 Credits (3)**

Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of Instructor required. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 302.

ACCT 570. Taxation of Partnerships**3 Credits (3)**

Taxation of partnership contributions and distributions, transfer of partnership interests, and allocations of partnership income. Also includes taxation of S corporations. Restricted to: Master of Accountancy majors.

Prerequisite(s): ACCT 403.

ACCT 580. Professional Accountancy**3 Credits (3)**

Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Restricted to: Master of Accountancy majors.

ACCT 598. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisite: consent of instructor.

ACCT 599. Master's Thesis**15 Credits**

Thesis.

ACES-AGRI, CONSUMER & ENV SCIE

ACES 1120. Freshman Orientation**1 Credit (1)**

Orientation to University life, including the understanding and utilization of resources that promote University success. Designed to promote success in achieving a career objective and perseverance for degree completion. Promotes a recognition of changes required in moving from high school to the University. Eight weeks in length, required for all freshmen in the College of Agricultural, Consumer and Environmental Science.

Learning Outcomes

1. Orient students to NMSU and to the College of Agricultural, Consumer and Environmental Sciences.
2. Develop an understanding of the personal skill set needed for academic success.
3. Develop awareness of the academic and personal resources available to NMSU students.
4. Help students create a peer network that will support their academic and personal success.
5. Strengthen skills in oral and written communications

ACES 1210. Financial Fitness for College Students**1 Credit (1)**

An introduction to personal financial practices in post high school and/or college lives. Emphasis is placed on budgeting, savings, investment, college debt, student loans, credit cards, scams and consumer protection.

Learning Outcomes

1. Discuss the importance of personal financial management during college years.
2. Discuss the essentials of following: a. paying yourself first and budgeting, b. differentiating between needs and wants, c. the significance of building and having good credit, d. managing debt, e. understanding and minimizing student loan debt, f. investing, g. life success principles, e.g., goal setting, time management, stress management.
3. Choose online financial tools to help them succeed financially.

ACES 1220. Academic Excellence**1-3 Credits (1-3)**

Academic curriculum of excellence that includes the development of collaborative learning and student success environment, learning diverse learning styles and multiple intelligences, and developing multi-contextual academic communication styles. Restricted to: Open to all ACES majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Demonstrate an understanding of the relationship between time management and academic success.
2. Express a familiarity with college culture.
3. Communicate a comprehension of study skills and test taking strategies.
4. Apply material learned to other aspects to enhance academic excellence.
5. Develop an academic and career life plan that will highlight goals, taking into account life circumstance
6. Become competent in appropriate professional/academic communication

ACES 301. Agricultural Leadership Development**1-3 Credits (1-3)**

This course will introduce the student to skill sets necessary to engage in the process of leadership through an applied project. A broad spectrum of principles and applications associated with the College of Agricultural, Consumer and Environmental Sciences will be employed. The development of a specific project through a collaborative process will be required. Students will be engaged in hands-on, real-time experiences applicable to agriculture. Student must have a 3.5 GPA and above. Consent of Instructor required. May be repeated up to 4 credits.

Learning Outcomes

1. Learn the key student support services available at NMSU.
2. Develop effective oral and written communication skills.
3. Learn elements of effective peer mentorship.

ACES 305. Advanced Leadership and Communication in Agricultural Sciences**1-3 Credits (1-3)**

Theory and application of advanced communication techniques, focusing on public speaking and public relations, are emphasized in this course for current and potential college ambassadors.

Learning Outcomes

1. Learn the mission, vision and pillars of the NMSU College of Agricultural, Consumer and Environmental Sciences.
2. Learn the key student support services available in ACES and at NMSU.
3. Understand the importance of professionalism and improve individual leadership skillset.
4. Develop effective oral and written communication skills, and employ these skills in delivery of student recruitment presentations and programs.

ACOM-AG COMMUNICATIONS

ACOM 1110. Introduction to Agricultural Communication 3 Credits (3)

Students will learn about the history and theories of agricultural communications, be introduced to the degree program, explore careers in the field, and examine the role of media in agricultural communications. May be repeated up to 3 credits.

Learning Outcomes

1. Identify classes needed in the degree program and relevant clubs.
2. Recall important times in history of agricultural communication and journalism.
3. Comprehend the communication process and identify its components.
4. Identify effective and efficient media for agricultural communication.
5. Analyze the various roles and uses of media in agriculture communication.
6. Apply theories of communication and journalism to class assignments.

ACOM 1120. Introduction to Graphic Design in Agriculture 3 Credits (3)

This course focuses on introducing students to creating and critiquing visual communication materials in agricultural communications by developing understanding of visual communications, graphic design and branding principles as well as basic skills in using Adobe Illustrator and Photoshop software.

Learning Outcomes

1. Understand and demonstrate the correct use of formats, modes, and resolutions when creating or using graphics for various mediums and audiences.
2. Critique and evaluate graphic and photographic design elements in agricultural communications pieces.
3. Demonstrate a working knowledge of the Adobe Illustrator and Photoshop software and their uses for implementing principles of graphic design and branding.

ACOM 1130G. Effective Leadership and Communication in Agriculture 3 Credits (2+2P)

Theory and practice in leadership and communication for professionals who must work effectively in leadership and supervisory roles with people in agricultural business, industry, government agencies, and education. Course focuses on contemporary leadership theories. Oral communication skills in informative and persuasive speaking, parliamentary procedure, and for small groups are developed. May be repeated up to 3 credits.

Learning Outcomes

1. Understanding Leadership: Definitions of Leadership; Agricultural Education, FFA , Leadership; Leadership Categories; Democratic, Authorization, and Situational Leadership; Personality and Leadership Relations; Developing Leaders; Personal Leadership Development; Ability, Experience, and the Opportunity to Lead; Leadership in the Workplace; Human Relations, Technical, and Conceptual Skills
2. Communication Skills: Communication and Leadership; The Purpose of Communication; Forms of Communication; Communication Barriers and Styles; Verbal and Nonverbal Communication; Feedback; Self Communication and Interpersonal Communication
3. Leading Individuals and Groups: Group Dynamics and Team Building; Democratic Group Leadership; Importance of Groups; Types of Groups; Organizing Groups; Group Dynamics, Development, and Discussion
4. Conducting Successful Meetings: Skills Developed by Bring an Officer; Basic Meeting Functions; Characteristics of a Good Meetings; Planning and Preparing for Meetings; The Meeting Room; Committees; Informative and Motivational Meetings; Group Member Involvement; Officer and Member Responsibilities; Developing a Program of Activities

ACOM 2120. Photography in Agriculture 3 Credits (1+2P)

This is a field-based course focused on how to students use the camera as a tool to make the rules of photography and design work for the student's style, creativity, and goals pertaining to application of photography in agricultural communications. Students develop and disseminate a photography portfolio through a variety of communications channels.

Learning Outcomes

1. Utilize a DSLR or mirrorless camera to analyze scenarios to effectively curate a body of work that compliments agricultural communications practice
2. Demonstrate working knowledge of camera equipment and photography principles to create visual stories
3. Evaluate and critique imagery for use of photography skills and principles

ACOM 2998. Early Field- Based Experience in Agricultural Communications**1-4 Credits (1-4)**

This course is designed to help you understand people and how to communicate with people. The key to all journalism or communications-related courses is to understand the audience well enough to know how to speak like them, to them, and to your stakeholders. The most successful communicators exhibit greatness in themselves and in their peers. Communicators cannot do their job if they do not show up with their best attitude and work ethic. Don't let your audience down, and we will make sure you are equipped to do so. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications in the agricultural or science industries.
2. Develop a communication campaign for an agriculturally related client.
3. Identify key principles of communication channels including newswriting, radio production, and communication plans.
4. Create effective internship application materials to meet needs in the industry.
5. Design a job portfolio that includes examples of communications experience.

ACOM 3110. Agricultural Communications**3 Credits (3)**

Principles and practical experience in news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities, especially as related to the fields of agriculture and family and consumer sciences.

ACOM 3115. Global Issues in Agricultural Communications and Marketing**3 Credits (3)**

Global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate agricultural communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.

ACOM 3125. Website User Experience Design in Agriculture**3 Credits (3)**

The purpose of this course is for students acquire user experience development, coding and web design skills in order to create a live personal portfolio website that demonstrates their professional skills and experiences in agriculture.

Learning Outcomes

1. Evaluate websites based on user experience principles
2. Use the fundamentals of HTML and CSS to edit code
3. Implement user experience principles in website design
4. Develop a website using WordPress
5. Explain and justify web design decisions

ACOM 3150. Communications Campaigns in Agriculture**3 Credits (3)**

Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple modes (e.g., written, visual, social). Students in this course will gain an overall understanding of the agricultural communications industry by developing portfolio materials, prepare for the job and internship search process, and identify the skills necessary to grow in and contribute to a communications profession.

Learning Outcomes

1. Students will be able to identify communications-related needs with a client or stakeholder in the food, fiber, and natural resources industries.
2. Direct a communications plan with channels, tactics, steps, and timelines for a client.
3. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
4. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.

ACOM 3160V. Communicating Agriculture & Science to the Public 3 Credits (3)

Principles and practical experience in general communications channels (i.e., news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities) related to the fields of agricultural, consumer, or environmental sciences. Students in this course will gain an overall understanding of the agricultural communications industry and identify the skills necessary to grow in and contribute to a communications profession.

Learning Outcomes

1. Explain the role of communications in the agricultural, consumer, or environmental science industries.
2. Develop a communication campaign for an agricultural, consumer, or environmental science related client.
3. Identify key principles of communication channels including news writing, radio production, and communication plans.
4. Design a social media campaign including Instagram, Facebook, Twitter, and/or other emerging platforms.
5. Develop skills in media communications including public relations, conducting radio and television interviews, developing interview skills and identifying the needs of an audience.
6. Create effective internship application materials to meet needs in the industry.
7. Design a job portfolio that includes examples of communications experience.
8. Examine social, ethical, and legal issues related to communicating components related to the agricultural, consumer, and environmental science industries.
9. Conduct an audience analysis of key issue related to the agricultural, consumer, and environmental science industries by analyzing demographics, psychographics, sociographics, and geographics of affiliated audience personas.

ACOM 4115. Agricultural and Scientific Publications 3 Credits (3)

Learn and gain experience with the principles and concepts of designing, writing, editing, producing and distributing a student insert to the ACES Magazine, including practical applications of writing feature articles, magazine design, layout and graphics.

Learning Outcomes

1. Execute the steps necessary to be a freelance writer.
2. Identify feature story ideas, contact sources and develop publishable stories.
3. Compare and contrast the varying types of publication materials (connection/spotlights, feature stories, social media sprints, etc.).
4. Comprehend publication design principles and current practices used in print communication industries.
5. Create, produce, publish and publicize a print magazine.
6. Connect with an audience through soft news.

ACOM 4120. Advanced Graphic Design and Layout in Agriculture 3 Credits (3)

This class provides an in-depth examination of visual communication principles and theories, design applications, and design topics relevant to the agricultural industry. Students will learn how to more deeply evaluate designs and layouts, create effective design pieces for targeted agricultural audiences, and further utilize the Adobe Creative Cloud software.

Learning Outcomes

1. Analyze and apply the principles underlying effective graphic design and layout
2. Recognize and discuss communication and visual theories for developing effective designs and layouts for intended purposes and audiences
3. Demonstrate an extensive working knowledge of Adobe Illustrator, Photoshop, and InDesign to create effective designs for both print and digital platforms

ACOM 4130. Strategic Brand Identity & Design in Agriculture 3 Credits (3)

The purpose of this course is for students to develop extensive understanding of strategic and visual theory and principles specific to branding as a critical aspect of business development in all aspects of agriculture and natural resources. Students will utilize research and Adobe Creative Cloud to design targeted brand strategy, client brief, and design strategy to effectively build a client pitch.

Prerequisite: ACOM 1120.

Learning Outcomes

1. Articulate the significance of utilizing brand identity for differentiation
2. Apply extensive knowledge of visual and brand theory, principles, strategy and application to various contexts in agriculture and natural resources
3. Research, design and pitch a brand strategy, client brief and design strategy

ACOM 4998. Internship in Agricultural Communications 3-12 Credits (3-12)

The experiential learning experience selected by students and approved by their academic advisor will form the basis of this course. Students will apply problem-solving skills, communication skills, and disciplinary knowledge through an internship related to agricultural communications. During the internship, students will gain real-world experience in their specific field of interest within the discipline. May be repeated up to 12 credits.

Learning Outcomes

1. Synthesize discipline-specific knowledge and its application to real-world contexts
2. Design and implement solutions to meet project-related tasks
3. Produce professional-quality deliverables for the employer and for the course
4. Handle a high level of responsibility with professionalism and care in preparation and presentation

ACOM 5115. Global Issues in Agricultural Communications and Marketing

3 Credits (3)

Graduate-level course broadening global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.
7. Research and dissemination information regarding international issues in agriculture using critical thinking skills.

AEEC-AGRICULTURAL ECON/ECON

AEEC 1110. Introduction to Agricultural Economics and Business

3 Credits (3)

This course is an orientation to agricultural economics and business through the discovery process for the consumer in the food, fiber, and natural resource sectors of the global economy. The course discusses the application of micro-and macro-economic principles as they relate to agricultural economics and business. May be repeated up to 3 credits.

Learning Outcomes

1. Gain a broad understanding of the role of the consumer in the marketplace for agricultural commodities, producers, agencies and the global market structure.
2. Apply introductory economic principles to applied global situations.
3. Employ economic concepts in the application of production level decision making.
4. Employ economic principles to the basic and global agricultural community.
5. Understand relationships that exist between producers and consumers.

AEEC 1120. Careers in Food and Agribusiness

1 Credit (1)

This course provides an orientation to careers in agricultural economics and agricultural business. Students will learn about the agricultural supply chain in New Mexico, the United States, and the world. Students will be introduced to faculty and staff within the department, learn about career opportunities available to AEAB graduates, and develop a greater appreciation of current agricultural issues. Freshman status or consent of instructor required. May be repeated up to 1 credit.

Learning Outcomes

1. Become familiar with career opportunities in agricultural economics and agricultural business
2. Understand knowledge and skills desired by employers
3. Become acquainted with faculty and staff in the Department of Agricultural Economics and Agricultural Economics and resources available to students within the Department
4. Refine written and verbal communication skills

AEEC 2110. Principles of Food and Agribusiness Management

3 Credits (3)

This course introduces business management theory and application of theory related to businesses within the food and fiber supply chain. Topics include management and financial principles, market planning, and organization theory. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate, refine and expand written and oral communication skills
2. Develop an understanding of basic financial statements, their use and analysis
3. Understand the roles management and management styles play in modern agribusiness
4. Learn about the history of agribusiness domestically and internationally
5. Integrate the role of technology into modern agribusiness management

AEEC 2120. Introduction to Food and Agribusiness Accounting

3 Credits (3)

This course outlines the purpose and methods of keeping and analyzing farm and ranch records. Course topics include financial statements, efficiency measures, analysis of the business, and tax computations.

Learning Outcomes

1. Understand the terminology and principles used in modern farm and ranch financial management statements.
2. Evaluate capital investments, analyze farm business performance, and develop tools for financial planning and analysis
3. Evaluate farm and ranch cash flows

AEEC 2130G. Survey of Food and Agricultural Issues**3 Credits (3)**

Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with: FSTE 2130G.

Learning Outcomes

1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulate modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

AEEC 2140. Technology and Communication for Business Management**3 Credits (2+2P)**

This course helps students improve their skills related to data analysis, information management, and communication. Drawing examples from a variety of management, business, technological and research situations, students discover the versatility and functionality of modern computer software. The course emphasizes a 'hands-on' approach. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding terms used to describe common techniques and concepts in business information systems.
2. Demonstrate mastery of spreadsheet design and use.

AEEC 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. Consent of instructor required.

Learning Outcomes

1. Varies

AEEC 300. Internship**1-4 Credits (1-4)**

Professional work experience under the supervision of a faculty member. May be repeated up to 6 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

Prerequisite(s): Consent of instructor.

AEEC 305. Marketing and Food Agricultural Products**3 Credits (3)**

This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. May be repeated up to 3 credits.

Crosslisted with: MKTG 305.

Prerequisite(s): ECON 1110G or ECON 2120G.

Learning Outcomes

1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations
4. Know the basic outline and components of a marketing plan

AEEC 311. Financial Derivative Markets**3 Credits (3)**

This course explores the role of financial derivatives in modern business, including income generation, risk management, and price discovery.

Derivatives markets covered in the course include futures, options, and swaps. Course content focuses on the fundamentals of trading and hedging in a wide variety of markets, e.g., agriculture, interest rates, exchange rates. Students participate in simulated futures and options trading. Same as AECC/BFIN 511 with additional coursework required at the graduate level. Cannot receive credit for both AECC/BFIN 311 and AECC/BFIN 511. Same as BFIN 311.

Learning Outcomes

1. Understand and explain the concept of risk, list various sources of risks observed in businesses, and identify common methods used to manage risk
2. Demonstrate an understanding of the vocabulary associated with derivatives and derivative markets
3. Articulate the role that derivative markets play in reducing risk and illustrate how they can be used in practice to reduce risk
4. Illustrate how derivative markets can be used to generate income and manage risk through hedging

AEEC 313. Food and Agricultural Sales**3 Credits (3)**

This course reviews the techniques of salesmanship. Course topics include identification and classification of buyer type and different approaches to sales based on client base. Improving oral communication skills through individual and/or group sales presentations. Students must be in Junior or above standing to enroll.

Learning Outcomes

1. Analyze sales situations and effectively identify pathways to closing the sale
2. Demonstrate execution of the sales process – prepare, learn, communicate, evaluate
3. Conduct product and customer analysis to build a sales strategy
4. Exhibit enhanced relationship management and communication skills

AEEC 314. Agricultural and Natural Resource Law**3 Credits (3)**

This course discusses the relationship of common-law principles, statutory law and regulatory law to problems involving agriculture with an emphasis on New Mexico issues. Legal problems relevant to agribusiness, torts, fencing laws, liability for agricultural pollution, irrigation water rights, corporations and partnerships, land tenure, farm and ranch tenancy, agricultural labor, farm and ranch management, and taxation.

Learning Outcomes

1. Understand the complexity of law as it relates to agriculture and natural resources
2. Develop a basic understanding of the legal system in the U.S. including the role of federal and state agencies responsible for agricultural and natural resource regulation
3. Articulate at a layperson's level, the roles of the legislative, judicial, and executive branches of the government as they relate to agriculture and natural resources.

AEEC 315V. World Agriculture and Food Problems**3 Credits (3)**

This course examines key concepts and issues relevant to the world's food production systems. Topical highlights include the causes and consequences of hunger, agriculture's economic and environmental significance, sustainable development, biotechnology, and globalization of agricultural markets. As students learn about these issues from both local and global perspectives they are engaged in the development of both their literacy of economic concepts and their core research and communication skills. We do this through a combination of relevant course readings, in-class discussion exercises, and focused writing assignments on current issues of relevance. Same as GEOG 315V. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate conceptual and systems thinking and design
2. Assess the nutrition and healthfulness of food choices
3. Describe the structure and function of food and agricultural systems
4. Analyze roles of and relationships between food producers, consumers, and policymakers
5. Apply basic economic concepts to describe and interpret food and agricultural issues
6. Explain the environmental context and role of agriculture
7. Articulate key arguments that favor and oppose food biotechnology
8. Recognize several of the benefits and barriers in international trade of food and agricultural products

AEEC 337V. Natural Resource Economics**3 Credits (3)**

This course helps students gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as ECON 337V. May be repeated up to 3 credits.

Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

Learning Outcomes

1. Demonstrate knowledge of economic principles to better understand natural resource issues
2. Document understanding of current and emerging natural resource issues
3. Apply economic principles to guide selected natural resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 340. Economics of Food and Agricultural Markets**3 Credits (3)**

This course focuses on the analysis of supply and demand characteristics of commodities with particular attention to agricultural products. Pays special attention to empirical analysis. Includes institutional aspects of pricing, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions.

Prerequisite: ECON 2120G, MATH 1430G, and A ST 311 or MATH 1350G.

Learning Outcomes

1. Become familiar with commonly used data analysis methods and tools
2. Develop an understanding of the factors that influence agricultural prices
3. Use data to analyze and solve real-world problems related to agricultural prices

AEEC 342. Economic Analysis of Food and Agribusiness**3 Credits (3)**

This course uses economic and business theory to analyze business decision making. The course includes a discussion of economic, managerial, and financial considerations relevant to modern agribusinesses.

Prerequisite: ECON 2110G, ECON 2120G.

Learning Outcomes

1. Understand the role of managers within the food and fiber supply chain
2. Develop an understanding of the applications of managerial economics as they related to businesses within the food and fiber supply chain
3. Analyze market conditions and assess the position of a business within the market
4. Identify and articulate optimal business decisions by analyzing economic and business information

AEEC 350. Spreadsheet Applications in Food and Agriculture
3 Credits (2+2P)

This course is an advanced course in electronic spreadsheets. Concepts and tools of data analysis and database management within a spreadsheet, emphasizing agricultural applications, are presented.

Prerequisite: AEEC 2140 or consent of instructor.

Learning Outcomes

1. Ability to effectively utilize some of the advanced features in Microsoft Excel by course end
2. Transforming agricultural and agribusiness problems into spreadsheet models for analysis
3. Increase critical thinking capacity with respect to solving problems/tasks
4. Develop creativity in solving problems/tasks

AEEC 384V. Water Resource Economics
3 Credits (3)

This course uses economic principles to evaluate current and emerging issues in water resources. Applications focus on the use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as ECON 384V. May be repeated up to 3 credits.

Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

Learning Outcomes

1. Demonstrate knowledge of economic principles to better understand water resource issues
2. Show understanding of current and emerging water issues
3. Apply economic principles to guide selected water resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 385. Applied Production Economics
3 Credits (3)

This course introduces students to fundamental economic theories and analytical tools required for managing an agricultural operation. In particular, the principles of microeconomics will be reviewed and applied to the problems faced by farms and ranches. The course focuses only on economic making at the farm or ranch level.

Prerequisite: (ECON 2120G or ECON 2120H) and (MATH 1430G) and (A ST 311 or MATH 1350G).

Learning Outcomes

1. Analyze production function and calculate the total, average, and marginal products
2. Derive profit-maximizing input and output combinations
3. Evaluate the relationship between production, revenue, and profit functions
4. Analyze crop budgets and determine optimal acreage allocation
5. Measure the impact of risk and uncertainty on agricultural production

AEEC 400. Senior Seminar
1 Credit (1)

This course focuses on current topics and cases in the agribusiness literature stressing rigorous qualitative analysis of current problems and policy issues. During the course, students provide feedback about their experience within the Department and help identify ways in which the Department can improve. Restricted to: AEAB; NREP majors. Must be Senior standing to enroll.

Learning Outcomes

1. Illustrate an understanding of economic and business concepts as illustrated and applied in case analyses
2. Articulate ways in which the Department can improve academically
3. Prepare future steps in careers, e.g., resumes, cover letters, mock interviews
4. Develop interpersonal communication skills

AEEC 420. Special Problems
1-3 Credits

Special problems in agricultural economics or agricultural business of particular interest to the individual student. Maximum of 3 credits per semester. No more than 6 credits toward degree. Consent of instructor required.

AEEC 425. Food and Agribusiness Financial Management
3 Credits (3)

This course provides a description and application of techniques and principles of financial management to problem situations faced by agricultural businesses, including financial statement development and analysis, capital budgeting, sources and costs of capital.

Prerequisite: ECON 2120G or ECON 2120H and ACCT 2110.

Learning Outcomes

1. Understand the time value of money and perform capital investment analysis for agricultural firms
2. Interpret financial statements used by agricultural firms
3. Comprehend farm financial risks and returns
4. Discuss financing options for U.S. farm businesses

AEEC 445V. Agricultural Policy
3 Credits (3)

This course provides a historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making, and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts.

Prerequisite: (ECON 2110G or ECON 2110H) and (ECON 2120G or ECON 2120H).

Learning Outcomes

1. Apply economic concepts to deepen understanding of agricultural policy, particularly with regard to macroeconomic importance to agriculture
2. Describe inherent tradeoffs and opportunity costs in policy
3. Identify the global impacts of U.S. agricultural policy
4. Explain and describe important agricultural policy issues for a lay audience

AEEC 451. Food and Agribusiness Market Assessment 3 Credits (3)

This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: MKTG 451.

Prerequisite(s): AEEC 305 or MKTG 305 or consent of instructor.

Learning Outcomes

1. Identify, organize and conduct market research specific to the project
2. Develop an understanding of primary and secondary research collection and analysis
3. Exhibit enhanced relationship management, communication skills, and team building
4. Develop written communication with final deliverable for implementation into the business world

AEEC 452. Food and Agribusiness Marketing Plan Development 3 Credits (3)

This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions.

Learning Outcomes

1. Illustrate abilities to make decisions based on market research and analysis, including financial analysis, analysis of consumer trends, and the business environment
2. Create professional marketing and business presentation
3. Build effective teams to analyze and present real-world marketing opportunities
4. Practice business decision making founded on evidence from market research

AEEC 456. Case Studies in Food and Agribusiness Management 3 Credits (3)

This course integrates production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in the management of agricultural businesses using a decision case approach. Student must be in Senior standing to enroll in this course.

Learning Outcomes

1. Exhibit an ability to understand complex and varying business and resource issues, including financial analysis, natural resource issues, and business operations
2. Provide reasoning and rationale for decision making, identifying the best options from many potential decisions
3. Practice business writing and communication skills

AEEC 458. Economics of Making and Marketing Wine 3 Credits (3)

This course is designed to provide a basic knowledge of the principles of winemaking with emphases on wine production and economics for small wineries and home winemaking. The course also focuses on the investment costs of starting small wineries and the costs of making wine and successful market strategies for small wineries. The class includes a hands-on lab that includes selecting, crushing, fermenting grapes, and all the steps required through bottling the wine. Students must be 21 to enroll in the class. Consent of instructor required.

Learning Outcomes

1. Identify and evaluate production costs, economics, and marketing strategies for small wineries
2. Identify current technologies used in the production of wine for home and in a small winery
3. Identify the processes required to make high-quality wine using hands-on winemaking techniques, sensory analysis, and testing
4. Learn the basics of Viticulture (wine grape growing) practices

AEEC 470. Real Estate Appraisal 3 Credits (2+2P)

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Students must be Junior or above to enroll.

Learning Outcomes

1. Distinguish between the Income Approach, Cost Approach, and Sales Comparison Approach
2. Identify market abstracted influences on value
3. Apply proper appraisal methodology
4. Demonstrate appraisal knowledge by writing a residential appraisal and a farm appraisal

AEEC 499. Senior Thesis 3 Credits (3)

Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. Restricted to AEAB majors.

Prerequisites: consent of department head and have senior standing.

AEEC 501. Microeconomic Theory 3 Credits (3)

A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability.

Prerequisite(s): ECON 371 and ECON 457, or consent of instructor.

AEEC 502. Macroeconomic Theory**3 Credits (3)**

This course provides contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy. May be repeated up to 3 credits.

Learning Outcomes

1. Develop an in-depth understanding of the IS/LM model
2. Understand how fiscal and monetary policy affect output, employment, interest rates and prices
3. Develop and use mathematical models of the economy
4. Derive the effect of a change in tax rates, government spending, or a change in the money supply, on the nation's output through expenditure multipliers
5. Understand how fiscal and monetary policy work in an Open economy
6. Understand the basics of Exogenous and Endogenous Growth Theory

AEEC 503. Introduction to Quantitative Methods**3 Credits (3)**

Introduce students to quantitative tools widely used in applied economic analysis such as regression analysis, statistical tests, and mathematical programming. Restricted to: Agricultural Economics and Business (Masters) majors.

AEEC 506. Economic and Financial Analysis of Agribusiness**3 Credits (3)**

This course focuses on common analytical tools used to evaluate the economic and financial performance of businesses operating in the food and fiber supply chain. The course uses a combination of course discussions, assignments, and case studies to present the material critical to the successful management of agribusinesses. Topics include financial statements and analysis, financial planning/modeling, financial risk and risk management, the time value of money, and capital budgeting methods used in agribusiness.

Learning Outcomes

1. Read, understand, and create financial statements used in agribusiness, including income statements, balance sheets, cash flow statements, and owner's equity statements.
2. Describe and conduct financial analysis including comparative analysis, change analysis, and common-size analysis, and ratio analysis.
3. Describe and understand credit in agricultural production and agribusiness.
4. Understand the importance of capital budgeting within agribusiness and be able to conduct capital budgeting.
5. Describe, calculate, and use standard measures of investment return including net present value, internal rate of return, discounted payback period, and simple payback period.

AEEC 511. Advanced Derivative Markets**3 Credits (3)**

This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC/BFIN 311 and AEEC/BFIN 511. Crosslisted with: BFIN 511. May be repeated up to 3 credits.

Learning Outcomes

1. Define risk and identify methods of managing risk
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets
3. Identify the role that derivative markets play in reducing risk
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation

AEEC 520. International Agricultural Trade Theory and Policy**3 Credits (3)**

This course provides a review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives. May be repeated up to 3 credits.

Prerequisite: ECON 371.

Learning Outcomes

1. Understand and be able to describe the importance of international trade to U.S. agriculture.
2. Familiar with commonly used trade models to describe impacts of trade barriers, for example tariffs, quotas, and subsidies.
3. Analyze trade agreements and their impact on economies of different trade partners.

AEEC 522. Public Sector Economics I**3 Credits (3)**

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as POLS 522.

AEEC 540. Econometrics I**3 Credits (3)**

An integration of quantitative and statistical techniques for research and management in economics and business.

Prerequisite(s): ECON 457 and ECON 405 or A ST 505.

AEEC 545. Advanced Agricultural Policy**3 Credits (3)**

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AEEC 445V with additional work required at the graduate level. Cannot receive credit for both AEEC 445V and AEEC 545.

Prerequisite: consent of instructor.

AEEC 550. Advanced Microcomputer Applications in Agriculture
3 Credits (2+2P)

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Taught with AEEC 450 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 450 and AEEC 550.
Prerequisite(s): AEEC 2140G or consent of instructor.

AEEC 551. Advanced Agribusiness Marketing
3 Credits (3)

Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with emphasis on strategic marketing issues changing trade policies, and global competitiveness.

Prerequisite: consent of instructor.

AEEC 556. Advanced Agribusiness Management
3 Credits (3)

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach.

AEEC 575. Economics of Water Resource Management and Policy
3 Credits (3)

Focuses on issues, approaches and methods used in the assessment of water resource management and policy problems. Extends and further develops student understanding and comprehension of specific economic concepts and methods that are useful in the assessment and management of water resources, including cost-benefit analysis, welfare economics, non-market valuation, watershed management, and consideration of equity and ethical concerns. Students will develop critical reasoning, communication and analytic skills through active class discussions and assignments that emphasize both quantitative and written products.

AEEC 585. Production Economics
3 Credits (3)

Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. May be repeated up to 3 credits.

Prerequisite(s): MATH 1430G, ECON 312, and ECON 457.

AEEC 590. Special Topics
3 Credits (3)

Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.

Prerequisite: consent of instructor.

AEEC 593. Internship
1-6 Credits

Supervised professional on-the-job training experience in policy analysis.

AEEC 594. Internship
1-6 Credits

One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.

AEEC 595. Internship
3 Credits (3)

Supervised professional on-the-job learning experience.

Prerequisite(s): Consent of instructor.

AEEC 596. Individual Study
1-3 Credits

Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.

Prerequisite: consent of instructor.

AEEC 597. Non-Thesis Research Project
1-3 Credits (1-3)

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree.

AEEC 598. Creative Component Project
3-6 Credits (3-6)

Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree. Consent of instructor required. Restricted to AEEC majors.

Prerequisite(s): Consent of Instructor.

AEEC 599. Master's Thesis
1-15 Credits

Thesis.

AERO-AEROSPACE STUDIES

AERO 121. Heritage and Values
2 Credits (1.25+2P)

"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 122. Heritage and Values II
2 Credits (1.25+2P)

"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 221. Team and Leadership Fundamentals
2 Credits (1.25+2P)

"Teams and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 222. Team and Leadership Fundamentals II
2 Credits (1.25+2P)

"Team and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 223. Air Force Leadership Development**1 Credit (2P)**

This course prepares cadets to excel in field training. Cadets are prepared in all facets of field training, including: leadership competency evaluations, the Cadet's Guide to Field Training, individual drill evaluations, attention to detail, dining hall procedures, maintenance of living areas, and the group problem solving process. Restricted to: Main campus only.

AERO 301. Leading People and Effective Communication**4 Credits (3+2P)**

"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Includes Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 302. Leading People and Effective Communication II**4 Credits (3+2P)**

"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Include Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 401. National Security, Leadership Responsibilities and Commissioning Preparation**4 Credits (3+2P)**

"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, and AERO 301/AERO 302, or permission of instructor.

AERO 402. National Security, Leadership Responsibilities and Commissioning Preparation II**4 Credits (3+2P)**

"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.

Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, AERO 301/AERO 302, and AERO 401 or permission of instructor.

AERO 411. Aerospace Studies Independent Study**1 Credit (1)**

This course provides in-depth research on specified topics of the United States Air Force and NMSU's Detachment 505 history. Consent of instructor required.

Prerequisite(s): AERO 301, AERO 302, AERO 401, AERO 402.

AERT-AEROSPACE TECHNOLOGY

AERT 105. Aerospace Engineering PLTW**4 Credits (2+4P)**

Introduce the student to Aerospace Engineering (AE) concepts and history. Studied topics include History of Flight, Aerodynamics, Rocket Science, Orbital Physics, Systems Engineering and Life Support/Environmental Systems. Restricted to: Community Colleges only.

AERT 111. Basic Electricity and Electronics**3 Credits (2+2P)**

Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated fiber optics, and industrial application topics. Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: ELT 105

AERT 121. Introduction to the Aerospace Workplace**4 Credits (2+4P)**

The course covers space history, regulations, controls, aerospace industry terminology and acronyms as well as hands-on activities related to tools, procedures, and standard practices. Restricted to: Community Colleges only.

AERT 122. Aerospace Safety and Quality**3 Credits (2+2P)**

Covers identification of hazards, personal protective equipment, safe practices, and protection of personnel, property, and equipment in the aerospace environment. Basic principles of quality assurance engineering and quality control relating to work processes will be discussed. Restricted to: Community Colleges only.

AERT 145. Introduction to Drone-UAS Technology**3 Credits (3)**

Introduction to drone or Unmanned Aircraft System (UAS) technology and its applications in architecture, engineering, construction, film, media, and other related industries. Best practices, training, permissions, licensing, and documentation requirements will be explored. Obtaining, working with, and managing data obtained by drones will be emphasized. Emerging technologies and future applications will be introduced. Restricted to Dona Ana Campus only.

Learning Outcomes

1. Describe applications of drone technology by industry.
2. Recognize types of drone data.
3. Provide examples of how drone data can be used in project visualization.
4. Identify standard drone features.
5. Utilize related applications, software, and hardware successfully.
6. Demonstrate professional practices.
7. Describe training, permissions, licensing, and documentation requirements.
8. Identify best practices of UAV use.
9. Process and produce imagery and videos from drone data. 1
10. Perform basic data processing. 1
11. Manage point cloud data. 1
12. Create 3D meshes from drone data. 1
13. Explore emerging technologies and future applications.

AERT 195. Introduction to Drone - UAS Equipment Operation and Maintenance

4 Credits (4)

Introduction to drone or Unmanned Aircraft System (UAS) equipment operation and maintenance. Flying and maneuvering drones will be practiced. Pre-flight, in-flight, and post-flight procedures will be emphasized. Drone maintenance will be introduced. Restricted to Dona Ana campus only.

Prerequisite: AERT 145.

Learning Outcomes

1. Describe related safety practices and procedures.
2. Discuss related communications requirements.
3. Demonstrate launch preparation steps.
4. Create a basic flight plan.
5. Demonstrate proper preflight, inflight, and post-flight procedures.
6. Describe standard flight operations.
7. Perform basic drone flight and maneuvers.
8. Identify elements of maintenance and inspection programs.
9. Describe related FAA requirements. 1
10. Demonstrate proper equipment and battery maintenance. 1
11. Describe proper parts and material control.

AERT 211. Electromechanical Devices

4 Credits (2+4P)

Theory and application of electromechanical devices and digital control circuits. Includes AD and DA converters, pneumatics, hydraulics, programmable logic controllers, DC, AC and stepper motors, and servomechanisms. Crosslisted with: MAT 240.

Prerequisite(s): ELT 160.

AERT 212. Materials and Processes (Basic Metallurgy)

3 Credits (2+2P)

Basic Metallurgy: Aluminum and its alloys (Alclad), hardening, tempering, annealing, anodizing, magnetism, titanium, copper, stainless steel, surgical steel, safety wire, iron rust. Metallurgical Processes: Welding and soldering. Inspection Fundamentals: Eddy currents, magnetic particles (ferrous and non-ferrous metals), ultrasonic, x-ray, visual, corrosion and corrosion control, and vacuum bagging. Restricted to: Community Colleges only.

AERT 213. Aerospace Fluid Systems

3 Credits (2+2P)

This course includes a familiarization of fluid system components, characteristics, and applications. Cryogenic and hypergolic materials and high pressure systems are also covered. Restricted to: Community Colleges only.

AERT 214. Aerospace Systems

3 Credits (2+2P)

This course provides an introduction to expendable and reusable spacecraft systems including hydraulic, pneumatic, electrical, propulsion, mechanical, HVAC, and ECLSS (Environmental Control and Life Support System). How systems interact with computer and data acquisition systems is also covered. Restricted to: Community Colleges only.

AERT 221. Inspection Requirements and Planning Metrology

3 Credits (2+2P)

Course teaches the benefits of inspection, quality control, material conditions. Also covers measurements, including temperature, ultrasonic, vibration and more. Restricted to: Community Colleges only.

AERT 222. Electromechanical Systems

3 Credits (2+2P)

Principles and applications of preventive and corrective maintenance procedures on industrial production machines using systems technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams. Crosslisted with: MAT 245.

Prerequisite(s)/Corequisite(s): AERT 221 or MAT 240. Prerequisite(s): ELT 160.

AERT 224. Aerospace Tests and Measurements

3 Credits (2+2P)

This course covers electrical and mechanical testing procedures (primarily non-destructive testing), equipment, measurements, and instrumentation involved in aerospace systems. Verification of tool and equipment calibration is also covered.

Prerequisite(s)/Corequisite(s): AERT 221. Restricted to: Community Colleges only.

AERT 225. Cooperative Experience

1-3 Credits (1-3)

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.

AERT 245. Remote Pilot Certificate Test Preparation

3 Credits (3)

Preparation course for the FAA Unmanned Aircraft General – Small (UAG) aeronautical knowledge exam. Overview of applicable regulations, restrictions, procedures, and operations will be provided. Process for obtaining an FAA Tracking Number (FTN), registering for the FAA Unmanned Aircraft General – Small (UAG) aeronautical knowledge exam, and certificate registration requirements will be explored. Restricted to Dona Ana campus only.

Prerequisite: AERT 195.

Learning Outcomes

1. Demonstrate increased knowledge related to topics covered in the FAA UAG exam.
2. Demonstrate increased skills related to topics covered in the FAA UAG exam.
3. Demonstrate increased abilities related to topics covered in the FAA UAG exam.
4. Describe processes related to obtaining a FAA Unmanned Aircraft General – Small (UAG) aeronautical certificate.
5. Practice certification test-taking skills.

AERT 255. Special Topics

1-4 Credits (1-4)

Specific topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

AERT 290. Independent Study

1-3 Credits (1-3)

Individual studies in areas directly related to aerospace. Consent of instructor required. Restricted to: Community Colleges only.

AFST-AFRICANA STUDIES

AFST 1110G. Introduction to Africana Studies

3 Credits (3)

An interdisciplinary course that introduce students to the histories, cultures, and experiences of global people of African descent. NMSU Specific Description This course presents a survey of the experiences of Blacks across the African Diaspora with particular attention given to the experience of Blacks in the United States. This course will examine the experiences of Black people across various disciplines and fields of academic inquiry. African people, and their descendants across the diaspora, have contributed to the political, cultural, economic, and social landscape of the world. This course will assist you in understanding the Black/Africana experience in the U.S. and around the world.

Learning Outcomes

1. Students will carry out critical analysis and engagement with complex, interdependent global systems and legacies (natural, physical, social, cultural, economic, and political) and their implications for people's lives and the earth's sustainability.
2. Students will explore issues/objects/works through collection and analysis of evidence that result in informed conclusions/judgments, understanding and analysis of critical literacy and ethics pertaining to the dynamics of diversity, equity, inclusion and social change.
3. Students will examine habits of mind characterized by the comprehensive exploration of issues, ideas, artifacts and events related to diversity, equity and inclusion before accepting or formulating an opinion or conclusion.
4. Students will demonstrate the capacity to combine or synthesize existing ideas, images, or expertise in original ways.
5. Students will prepare, purposeful presentations designed to increase knowledge, foster understanding, or promote change in listener's values, beliefs, or behaviors pertaining to the dynamics of diversity, equity, inclusion and social change.
6. Students will develop and express ideas in writing and learning in many genres and styles using different writing technologies, mixing texts, data and images that relate to the dynamics of diversity, equity, inclusion and social change.
7. Students will show the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situation.
8. Students will demonstrate the ability to know a need for information or visual literacy and understanding of the dynamics of historic and contemporary inequality and how they shape individual and community power, biases, structural arrangements and social justice bias.
9. Students will enact behaviors and efforts and interact with others on the team to enhance the quality and quantity of contributions made to team discussions. 1
10. Students will design, evaluate and implement strategies to answer open-ended questions in multiple ways. 1
11. Students will work to make a difference in the civic life of communities and develop the combination of knowledge, skills and values and motivation to make a difference. 1
12. Students will develop their cognitive, affective and behavioral skills and characteristics to support effective and appropriate interaction in a variety of cultures. 1
13. Students will develop their ethical self-identity as they practice ethical decision making skills while learning how to describe and analyze positions on ethical issues. 1
14. Students will engage in self-reflection regarding one's own history and position in contemporary U.S. society as well as in a global context. 1
15. Student learners will connect perspectives and integrate relevant

AFST 2110G. African American History

3 Credits (3)

This course surveys the long and turbulent journey of African-Americans, the rich culture they have cultivated, and their persistent struggle for freedom from the perspective, interests, aspirations, possibilities and envisioned destinies of African descended peoples. From African antiquity to the 21st century, students will study: 1) The African background; 2) The Holocaust of Enslavement; 3) Black Resistance and Abolition; 4) Reconstruction; 5) The Jim Crow Era; 6) Civil Rights and Black Power, and; 7) The Post-Industrial/Post Civil Rights Era. (unique)

Learning Outcomes

1. Demonstrate a full ability to analyze and interpret how enslavement and oppression shape the racial, gendered, social, economic, and political realities of African descended people in the U.S.
2. Recognize and respond to ethical challenges/social justice issues that affect African American people.
3. Acquire a critical understanding of the human condition.

AFST 2140G. Black Women in the African Diaspora

3 Credits (3)

This survey course reviews the contributions of Black women to the Black Diasporic Story. NMSU Specific Description This course critically surveys Black women's history and experiences across the African Diaspora. Particular attention is given to Black women's experiences in North America. Some of the topics covered include: Black women and the building of nation-states; Black women in the U.S. slave system; Black women in race and gender movements in the U.S. and Latin America; systemic and institutionalized violence against Black women; Black motherhood; Black Latinas and the politics of identity; representations of Black women in popular culture; radical activism and Black lesbian identity, as well as the emergence and growth of Black feminist theory and selected other topics. In addition, students will engage in an autobiographical project on a Black woman they select to study.

Learning Outcomes

1. Students will gain theoretical knowledge of the field of Black feminist thought.
2. Students will explore the relationship between Black feminist theory and the larger more general body of work on feminism.
3. Students will study the historical, political and social experiences of Black women in the Americas.
4. Students will understand the intersecting relationship between race, gender, class and sexuality.
5. Students will critically analyze the representations of Black women in popular culture.

AFST 4110. Race, Culture, and Education**3 Credits (3)**

This course deconstructs the history of education through the lens of culture and race. Using a intersectionality framework, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/ multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today.

Learning Outcomes

1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

AGRO-AGRONOMY

AGRO 1110G. Introduction to Plant Science (Lecture & Lab)**4 Credits (3+2P)**

This is an introductory course for understanding plant science. Basic biological, chemical, and physical principles of various plants are covered. The focus of this course is on plants/crops used in agriculture production of food and fiber as well as pasture and range plants. Plant taxonomy and soil properties will also be discussed. Same as HORT 1115G.

Learning Outcomes

1. Describe the basic structure of plants including growth and function.
2. Define photosynthesis, respiration, and translocation
3. Utilize plant taxonomy techniques to identify various plants.
4. Classify soils based on their chemical and physical properties.
5. Explain how different soil properties affect plant growth and sustainability.

AGRO 2160. Plant Propagation**3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Crosslisted with HORT 2160.

Learning Outcomes

1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, "hands-on" laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

AGRO 2996. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

AGRO 300. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

AGRO 303V. Genetics and Society**3 Credits (3)**

Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: GENE 303V.

AGRO 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

AGRO 311. Introduction to Weed Science**4 Credits (4)**

Principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Same EPWS 311.

Prerequisite: CHEM 1215G and BIOL 2110G.

AGRO 315. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 315

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

AGRO 365. Principles of Crop Production**4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production.

Crosslisted with: HORT 365

Prerequisite(s): AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.

AGRO 377. Introduction to Turfgrass Management**4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with:

HORT 377

AGRO 391. Internship**1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/ U, Audit).

Prerequisite(s): Consent of instructor.

AGRO 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: HORT 447, ENVS 447 and SOIL 447.

AGRO 449. Special Problems**1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

AGRO 450. Special Topics**1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

AGRO 462. Plant Breeding**3 Credits (3)**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

Prerequisite(s): ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

AGRO 471. Plant Mineral Nutrition**3 Credits (3)**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as HORT 471 and EPWS 471. May be repeated up to 3 credits.

Prerequisite/Corequisite: EPWS 314/BIOL 314, or concurrent enrollment, or consent of instructor.

AGRO 483. Sustainable Production of Agronomic Crops**4 Credits (3+2P)**

Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of cereal grain, fiber, forage and oilseed crops.

Corequisite(s): AGRO 365/ HORT 365.

AGRO 492. Diagnosing Plant Disorders**3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and HORT 492.

Prerequisites: EPWS 303 and EPWS 310.

AGRO 500. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

AGRO 505. Research Orientation**4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, SOIL 505 and ENVS 505.

AGRO 511. Introduction to Weed Science (f)**4 Credits (4)**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Same as EPWS 511.

Prerequisites: CHEM 1215G or BIOL 2110G, or consent of instructor.

AGRO 515. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: HORT 515

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

AGRO 516. Molecular Analysis of Complex Traits**3 Credits (3)**

Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Same as HORT 516.

Prerequisite: AGRO 305 or consent of instructor.

AGRO 525. Scientific Writing- How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: HORT 525, EPWS 525, SOIL 525, AGRO 625, HORT 625 and SOIL 625.

AGRO 590. Graduate Seminar**1 Credit (1)**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as HORT/ SOIL 590. Crosslisted with: HORT 590 and SOIL 590.

AGRO 595. Internship**1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

AGRO 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: ENVS 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

Prerequisite(s): Master level graduate students.

AGRO 597. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ES course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Restricted to: Main campus only. Restricted to Agronomy and Horticulture Graduate Students. Crosslisted with: HORT 597 and SOIL 597

AGRO 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.

AGRO 599. Master's Thesis**15 Credits**

Thesis.

AHS-ALLIED HEALTH SCIENCE

AHS 115. Dietary Guidelines & Meal Planning**4 Credits (4)**

A combination of the science of nutrition and the current Dietary Guidelines for Americans with practical application to meal planning and preparation. Strategies and techniques used to plan and prepare healthful and appetizing meals are explored. Evidenced-based dietary guidelines are provided to meet the needs of individuals and groups with chronic diseases. Menu development, modification and analysis are reviewed. Restricted to Community Colleges campuses only.

AHS 120. Medical Terminology**3 Credits (3)**

The study and understanding of medical terminology as it relates to diseases, their causes and effects, and the terminology used in various medical specialties. Emphasis will be placed on learning the basic construction of medical words, appropriate spelling, use of medical terms, and use of medical abbreviations. Same as HIT 150. May be repeated up to 3 credits. Crosslisted with: NURS 150, BOT 150 and HIT 150. Restricted to Community Colleges campuses only.

AHS 140. Essentials of Anatomy and Physiology**4 Credits (3+3P)**

Essentials of anatomy and physiology for those considering a career in health as well as those interested in understanding their own body and the basics of health.

AHS 153. Introduction to Anatomy and Physiology I**4 Credits (3+3P)**

Survey of human anatomy and physiology.

Prerequisite: high school biology or high school chemistry, or CHEM 1120G, or consent of instructor.

AHS 155. Special Topics**1-6 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

AHS 190. Clinical Skills & Concepts for Medical Assisting I**6 Credits (3+6P)**

A core course designed to provide an introduction to the theory, concepts, and skills needed for entry-level medical assisting positions. Content includes basic theory and concepts designed to support safe and effective practice as a medical assistant in ambulatory care settings. Includes a skills laboratory for hands-on practice and 96 hours of supervised clinical in the work environment. Restricted to Community Colleges campuses

Learning Outcomes

1. Apply theoretical knowledge associated with medical assisting in providing basic healthcare services.
2. Perform essential clinical skills within the medical assistant scope of practice in ambulatory clinic settings.
3. Recognize factors that affect procedures and results, and take appropriate actions with predetermined limits when indicated, including patient compromise or complications.
4. Demonstrate professional conduct and interpersonal communication skills with patients, other health care professionals, and with the public.
5. Recognize the responsibilities of other health care personnel and interact with them with respect for their jobs and patient care.
6. Apply basic scientific principles in learning new techniques and procedures.
7. Relate vital sign and laboratory findings to common disease processes.

AHS 202. Legal and Ethical Issues in Health Care**3 Credits (3)**

Consideration of legal and ethical issues in modern health care delivery.

AHS 250. Spanish for Health Professionals**3 Credits (3)**

Spanish for Health Professionals is a 3 credit course geared toward individuals working or majoring in health related areas. The course focus is on conversation and vocabulary needed for the workplace and task based practical skills. Restricted to: Community Colleges only.

AHS 280. Medical Office Administration & Management**4 Credits (2+4P)**

A core course designed to provide the theory, concepts, and skills needed in preparation for entry-level medical assisting positions. Content includes theory and concepts related to medical office administration. The course includes skills, hands-on practice, and 40 hours of supervised clinical in the work environment in ambulatory care settings. Restricted to Community Colleges campuses only.

AHS 290. Clinical Skills & Concepts for Medical Assisting II
6 Credits (3+6P)

A core course designed to provide the theory, concepts, and skills needed in preparation for entry-level medical assisting positions. Content includes theory and concepts related to specialty areas of healthcare practice, as well as consideration for conditions affecting persons throughout the life span. The course includes a skills laboratory for hands-on practice and 96 hours of supervised clinical in the work environment with specialized populations and procedures in both ambulatory and acute care settings. Restricted to Community Colleges campuses

Learning Outcomes

1. Apply theoretical knowledge associated with medical assisting in providing basic healthcare services.
2. Perform essential clinical skills within the medical assistant scope of practice in ambulatory clinic settings where specialized care is given, as well as, acute care settings.
3. Recognize factors that affect procedures and results, and take appropriate actions within predetermined limits when indicated, including patient compromise or complications.
4. Demonstrate professional conduct and interpersonal communication skills with patients, other health care professionals, and with the public.
5. Recognize the responsibilities of other health care personnel and interact with them with respect for their jobs and patient care.
6. Apply basic scientific principles in learning new techniques and procedures.
7. Relate vital sign and laboratory findings to common disease processes.

ANSC-ANIMAL SCIENCE

ANSC 1110. Animal Science Careers
1 Credit (1)

Introduction to scientific disciplines and career options in animal-agriculture career skill development, including resume preparation, networking, importance of internships, and leadership experiences in animal agriculture.

Learning Outcomes

1. Increasing the understanding of career opportunities in animal agriculture.
2. Gain a broad experience in the development of creative thinking about the career choices available in animal agriculture.
3. Apply the increased knowledge of career development in the career path and internship directions for each student.
4. Gain leadership experience that will be impactful for the student in their pursuit of a career in animal agriculture.

ANSC 1120. Introduction to Animal Science
3 Credits (3)

This course is designed to provide an introduction to nutrients and their function in livestock animals. Basic feed identification, evaluation, and diet formulation will be discussed. The anatomy of the digestive tract of animals and their ability to utilize feedstuffs is presented. Classification, digestion, absorption, transport and metabolism of major nutrients required by animals are studied

Learning Outcomes

1. Identify conventional and non-conventional feedstuffs that are fed to livestock animals.
2. Describe various methods for feed processing and storage.
3. Assess the nutritional value of a ration or feed ingredients.
4. Interpret the NRC (Nutrient Requirement Council) guidelines for feeding livestock.
5. List the basic digestive anatomy for all classes of livestock.
6. Describe nutritional deficiencies and digestive disorders common to livestock animals

ANSC 1120H. Introduction to Animal Science Honors
3 Credits (3)

This course is designed to provide an introduction to nutrients and their function in livestock animals. Basic feed identification, evaluation, and diet formulation will be discussed. The anatomy of the digestive tract of animals and their ability to utilize feedstuffs is presented. Classification, digestion, absorption, transport and metabolism of major nutrients required by animals are studied. Additional course work will be required. Restricted to Las Cruces campus only.

Prerequisite(s): Eligibility for membership in honors college.

Learning Outcomes

1. Identify conventional and non-conventional feedstuffs that are fed to livestock animals.
2. Describe various methods for feed processing and storage.
3. Assess the nutritional value of a ration or feed ingredients.
4. Interpret the NRC (Nutrient Requirement Council) guidelines for feeding livestock.
5. List the basic digestive anatomy for all classes of livestock.
6. Describe nutritional deficiencies and digestive disorders common to livestock animals

ANSC 1120L. Introduction to Animal Science Lab
1 Credit (2P)

Students will observe and participate in activities related to farm animal management and will include areas of livestock selection, nutrition, reproductive physiology, animal ID and animal health. This lab is required for animal science majors.

Prerequisite(s)/Corequisite(s): ANSC 1120.

Learning Outcomes

1. To provide the students with an understanding of the principles, concepts and terminology of today's livestock industry

ANSC 1130. Western Equitation I
2 Credits (4P)

Basic principles of Western riding, including care and management of the riding horse, equitation equipment, and development of riding skills.

ANSC 1140. Introduction to Dairy Science**3 Credits (3)**

Introduction to the basic aspects of dairy science and how to apply key concepts to the practical feeding and management of dairy cattle and production of dairy products. Students should also obtain an appreciation for the size and diversity of the dairy industry.

Prerequisite(s)/Corequisite(s): ANSC 1120. Restricted to Las Cruces campus only.

Learning Outcomes

1. Learn key concepts in dairy production and management
2. Be familiar with terms used in production of milk and milk products

ANSC 1160. Introductory Horse Science**3 Credits (2+2P)**

The light horse industry; breeds; introduction to feeding, breeding, marketing and management; handling and selecting horses for breeding and performance.

Learning Outcomes

1. Describe and identify breeds of horses, their characteristics and their uses.
2. Demonstrate knowledge of basic physiology of horses by recalling parts of the horse, including bones, muscle, tendons and ligaments. Also, by ageing horses via teeth, body condition scoring and taking vital signs.
3. Demonstrate safe and proper handling of horses.
4. Demonstrate comprehension of basic nutrition and feedstuffs by formulating/correcting diets in clinical and non-clinical situations.
5. Recall aspects of basic reproduction by calculating a stallion book and recalling appropriate procedures for breeding.
6. Create informative articles that seek to educate the lay horse person about a topic covered in class.

ANSC 1170. Introduction to Animal Metabolism**3 Credits (3)**

Principles underlying the mechanisms of animal metabolism as they relate to production, maintenance, and health of animals.

Prerequisite: CHEM 1215G.

Learning Outcomes

1. This course provides an introduction to the study of the physiology of life.
2. The first part of the course covers acids and bases and the chemical nature of organic compounds.
3. The second part of the course relates to the chemistry of biomolecules (nutrients) and summarizes the chemical reactions of life (metabolism).

ANSC 1180. Companion Animal in Society**3 Credits (3)**

Examination of the historical, current, and potential future roles of companion animals in human society. Topics include animal domestication, breeds, exotic companion animals, the companion animal industry, and competitions and sports involving companion animals. Emphasis is on canine and feline species. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Discuss the theories regarding why, how, and when companion animals became domesticated.
2. Describe how selective breeding has optimized certain physiological and behavioral traits of companion animals in order to fulfill the needs of individual people and society.
3. Explain the concept of human-companion animal interaction (HAI) and the influence this bond has on human behavior, health, society, and government policy/laws.
4. Understand the breadth and economic impact of the rapidly expanding companion animal industry and the recent expenditure trends of pet owners.
5. Discuss the past and present uses of companion animals and theorize regarding the future uses of companion animals in society
6. Be effective in searching for, and critically evaluating, scientific based resources.

ANSC 2120. Equine Management**3 Credits (3)**

Introduction and application of the business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

Prerequisite: ANSC 1160.

Learning Outcomes

1. Develop a working knowledge of the business principles needed to operate a successful entrepreneurial enterprise.
2. Increase the awareness of the need for business principles in the aggregate function of an equine operation.
3. Gain a greater perspective of accounting, economic and financial principles in an equine business operation.

ANSC 2130. Western Equitation II**2 Credits (4P)**

Intermediate principles of Western riding, including reading horse behavior, limbering-up exercises, and developing riding skills. Introduction to rollbacks, turnarounds and stops.

Prerequisite: consent of instructor.

Learning Outcomes

1. Increasing the understanding of the student relative to equitation practices
2. Increase the students' ability to apply principles of Western Equitation to applied settings across a broad spectrum of outlets
3. Prepare the student to engage equine in a professional manner

ANSC 2140. Introduction to Companion Animal Science**3 Credits (3)**

Introduction to the care of common companion animal species. Species specific housing and nutrition are covered in the context of maximizing animal health and well-being and reducing disease. May be repeated up to 3 credits.

Learning Outcomes

1. Accurately use scientific terminology common to the companion animal discipline.
2. Compare and contrast the physiological similarities and differences between the various companion animal species studied in class.
3. Create dietary plans based on the nutritional needs of different companion animal species to optimize animal health and lifespan.
4. Identify symptoms of disease/injury at the early stages of illness in order to obtain Veterinary care and treatment as quickly as possible.
5. Design and construct species specific cages/vivariums to maximize animal well-being and health.
6. Educate others regarding providing the best possible care for a variety of companion animal species.

ANSC 2150. Management of Equine Operations**3 Credits (3)**

Introduction and application of business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

Prerequisite(s): ANSC 1160.

Learning Outcomes

1. Acquire a working knowledge of different sectors of the equine industry, including business practices, management and marketing skills.

ANSC 2310. Introduction to Meat Science**3 Credits (2+3P)**

Fundamental aspects of the red meat industry. Lecture topics and laboratory exercises include the nutrient value of meat, meat preservation, meat safety, muscle structure and contraction, slaughter and processing of beef, lamb and pork, sausage manufacture, meat curing, meat cookery, and muscle and bone anatomy.

Learning Outcomes

1. Increasing the understanding of meat science applications across animal agriculture.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat science in a global situation.
4. Gain an understanding of the components involved in the development and processing of the red meat industry.

ANSC 2330. Animal Production**3 Credits (2+2P)**

Production and utilization of beef cattle, sheep, and swine; emphasis on feeding, breeding, management problems and marketing; selection of animals for breeding and market

Learning Outcomes

1. Increasing the understanding of meat animal production.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat animal production to global situations.
4. Gain a broader understanding of the importance of meat animals in the global food system.

ANSC 2340. Genetics in Animal Science**3 Credits (3)**

Introduction to genetics and inheritance relative to livestock production. Introduction to procedures for collection and use of performance information in livestock improvement programs.

Prerequisites: BIOL 2610G.

Learning Outcomes

1. Gain a broader understanding of the role genetic impacts in the livestock industry.
2. Employ an increased knowledge of impact of genetics in the food animal industry and the production and economic principles that apply.
3. Recognition of the global impacts of genetics in the food animal industry in a global setting.

ANSC 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

Learning Outcomes

1. Varies

ANSC 301. Animal and Carcass Evaluation**3 Credits (2+2P)**

Determination of the market value of meat animals by relating live animal and carcass traits. Topics include the identification of economically important traits, grading, growth and development, wholesale and retail pricing, and futures and options markets.

ANSC 303. Livestock, Meat and Wool Evaluation**4 Credits (3+2P)**

Selection, classification, grading, and judging of livestock, meat, and wool.

ANSC 304. Feeds and Feeding**3 Credits (2+2P)**

Digestibility of feeds, their nutritive values, grades, and classes, principles of ration formulation and computer ration formulations, and practical feeding of farm animals. Prerequisite(s): CHEM 1215G

ANSC 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

ANSC 308. Horse Evaluation**4 Credits (2+4P)**

Students will acquire a working knowledge of selection and classification of horses, learn criteria for evaluation and selection of breeding and show animals, gain a broad understanding of judging conformation and performance in the horse, and learn effective oral and written communication skills through defense of class placings. This course is considered an introduction to the NMSU Horse Judging Team.

ANSC 310. Exhibiting Livestock**3 Credits (1+4P)**

Fitting and showing beef cattle, dairy cattle, sheep and swine.

ANSC 312V. Companion Animals and the Human- Animal Interaction**3 Credits (3)**

The science behind human-animal interactions (HAI). An examination of the interactions between humans and companion animals and the effects on human and animal health and wellness. Cultural differences in HAI will be explored. Topics will include Animal Assisted Activity (AAA), Animal Assisted Therapy (AAT), and service animals. Emerging and future uses of companion animals in HAI will be discussed.

ANSC 320. Equine Behavior and Training**3 Credits (6P)**

Basic principles, methods and philosophies of handling, breaking and training the two-year-old Western horse. May be repeated up to 6 credits.

Prerequisite(s): ANSC 2130 or consent of instructor.

ANSC 321. Advanced Equine Behavior and Training**3 Credits (6P)**

Continuation of ANSC 320. Further development of skills required to advance the training of the two-year-old Western horse. Emphasis will be placed on lateral work, lead changes, turn-arounds, obstacles, and making the horse accustomed to ranch and trail riding situations.

Prerequisite(s): ANSC 320 or consent of instructor.

ANSC 350. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

ANSC 351V. Agricultural Animals of the World**3 Credits (3)**

Global study of the development and use of animals for production of food and nonfood products. Climatic, cultural, and economic influences on systems of livestock production and species and breeds of livestock utilized will be evaluated.

ANSC 370. Anatomy and Physiology of Farm Animals**4 Credits (3+2P)**

Structure and function of the animal body. Includes studies of the horse, cow, sheep, pig, and comparisons with the human body.

Prerequisite(s): CHEM 1215G and BIOL 2610G or BIOL 2110G.

ANSC 383. Equine Reproductive Management**3 Credits (1+4P)**

Anatomy, physiology, and endocrinology of reproduction of the mare and stallion; training in modern reproductive techniques employed in the horse industry.

Prerequisites: ANSC 1160, ANSC 2150, and ANSC 370.

ANSC 390. Internship**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

Prerequisite: consent of instructor.

ANSC 391. Undergraduate Research Experience**1-3 Credits (1-3)**

Formal laboratory, library, or field study of problems related to animal sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 392. Animal Sciences Teaching/Extension Experience**1-3 Credits (1-3)**

: Formal teaching experience related to animal sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students may also be involved in development, implementation, or assessment of adult or youth educational programs related to animal sciences, supervised by a faculty member. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 402. Animal Science Seminar**1 Credit (1)**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

ANSC 402 H. Animal Science Seminar**1 Credit (1)**

Taught with ANSC 402 with additional work.

Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status.

ANSC 411. Canine and Feline Behavior and Training**3 Credits (3)**

The influence of domestication, breeds, genetics, and physiology on the behavior of canine and feline species. Training methods and modification of problem behaviors are examined. The impact of the pet parent on their animal's behavior is addressed. May be repeated up to 3 credits.

Prerequisite(s): Junior or Senior status or consent of the instructor.

ANSC 412. Canine and Feline Health and Diseases**3 Credits (3)**

A review of common infectious and non-infectious diseases and the basics of the immune response. Pathophysiology and treatment of these diseases and the role the pet parent plays in pre-disposing their animals to disease. May be repeated up to 3 credits.

Prerequisite(s): ANSC 2140 or consent of instructor.

ANSC 421. Physiology of Reproduction**4 Credits (3+2P)**

Fertility and the role of hormones, nutrition, selection, management and environment in the maintenance of high reproductive rate.

Prerequisite(s): ANSC 370.

ANSC 422. Animal Nutrition**3 Credits (3)**

Nutrient utilization and measurement and nutrient requirements for the various body functions.

Prerequisite(s): CHEM 2115 or CHEM 313 or ANSC 1170.

ANSC 423. Animal Breeding**3 Credits (2+2P)**

Mating systems, and selection procedures; calculation of inbreeding coefficients, genetic relationships, and gene frequency.

Prerequisite(s): ANSC 2340 or 305.

ANSC 424. Swine Production**3 Credits (2+2P)**

Breeding, feeding, and care of swine.

Prerequisite(s): ANSC 304.

ANSC 425. Horse Science and Management**3 Credits (2+2P)**

Senior level course requiring students to apply basic knowledge acquired in the previous courses to solve typical problems encountered in the horse industry. Specific topics include genetics and animal breeding, business and legal issues, reproduction, health, nutrition and exercise physiology.

Prerequisite(s): ANSC 304 and ANSC 370 or concurrent registration.

ANSC 426. Beef Production: Cow-Calf Management**3 Credits (2+2P)**

Senior level course examining management practices for the cow-calf producers. Specifically focusing on nutrition, reproduction, genetics, marketing, and health. May be repeated up to 3 credits.

Prerequisite(s): ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.

ANSC 427. Dairy Production**3 Credits (2+2P)**

Breeding, nutrition, physiology and management of dairy cattle.

Prerequisite(s): ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.

ANSC 428. Sheep and Wool Production**3 Credits (2+2P)**

Genetics, nutrition, physiology and management of sheep. Wool grading, shearing, and disease control.

Prerequisite(s): ANSC 304 and junior status.

ANSC 429. Beef Production: Feedlot Management**3 Credits (2P)**

Senior level course in feedlot management of beef cattle. Topics of interest include cattle handling and processing, health and nutrition, intake management, and growth. Feed mill operation, marketing strategies, and regulatory concerns associated with finishing cattle production may also be discussed.

Prerequisite(s): ANSC 304 or Consent of Instructor.

ANSC 448. Problems**1-4 Credits**

Individual investigation in a specific area of animal science. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 458. Livestock Behavior, Welfare and Handling**3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: RGSC 458

Prerequisite(s): RGSC 2110 or ANSC 1120.

ANSC 462. Parasitology**3 Credits (3)**

Same as EPWS 462.

ANSC 468. Advanced Dairy Herd Management**3 Credits (3)**

The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as topics vary. Consent of instructor required.

Prerequisite(s): ANSC 304.

ANSC 480. Environmental Physiology of Domestic Animals**3 Credits (3)**

Influence of environmental factors on physiological processes of domestic animals.

Prerequisite: ANSC 370.

ANSC 484. Ruminant Nutrition**3 Credits (3)**

Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds.

Prerequisite: ANSC 422.

ANSC 488. Equine Nutrition and Exercise Physiology**3 Credits (2+2P)**

Students will gain an in-depth understanding of nutrition and exercise physiology in the horse. Students will investigate the response of major physiological systems to exercise, conditioning and training, gastrointestinal physiology, nutrition requirements and clinical nutrition of the horse. Students must have Junior standing or higher to enroll in this course.

ANSC 501. Advanced Animal Nutrition (so)**3 Credits (3)**

Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied.

Prerequisite(s): CHEM 2115 or consent of instructor.

ANSC 504. Animal Physiology Techniques (se)**4 Credits (4)**

Radioimmunoassay procedures. Methods and procedures for conducting reproductive physiology research in livestock. Includes animal preparation, sample collection, laboratory and cell culture procedures.

Prerequisite: consent of instructor.

ANSC 507. Laboratory Techniques in Nutrition (f)**4 Credits (2+6P)**

Methodology and experimental procedures in measuring nutrient requirements and value of diets.

Prerequisites: ANSC 422 or consent of instructor.

ANSC 509. Endocrinology of Domestic Animals (f)**3 Credits (3)**

The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.

ANSC 510. Range Nutrition Techniques (se)**3 Credits (3)**

Animal and plant methods of determining quantity and quality of range forage. Same as RGSC 510.

Prerequisite: ANSC 484 or consent of instructor.

ANSC 512. Research Methods in Animal Science (s)**4 Credits (3+2P)**

Procedures used in animal science research, including planning and conduct of investigations and interpretation of results.

ANSC 515. Graduate Seminar**1 Credit (1)**

Current topics.

ANSC 520. Advanced Nutritional Management I: Feedlot (se)**3 Credits (3)**

Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management.

Prerequisite: ANSC 484 or consent of instructor.

ANSC 521. Advanced Nutritional Management II: Cow Calf/Stocker (so)**3 Credits (3)**

Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management.

Prerequisite: ANSC 484 or consent of instructor.

ANSC 522. Animal Nutrition (f)**3 Credits (3)**

Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 with additional requirements for graduate students. Recommended for nonmajors.

Prerequisite(s): CHEM 2115.

ANSC 560. Rumen Microbiology (so)**3 Credits (3)**

Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Same as FSTE 560.

Prerequisites: ANSC 501.

ANSC 580. Environmental Physiology of Domestic Animals**3 Credits (3)**

Influence of environmental factors on physiological processes of domestic animals. Specific focus on fetal and developmental programming, heat and cold stress.

ANSC 598. Special Research Programs**1-4 Credits (1-4)**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.

Learning Outcomes

1. Various

ANSC 600. Research**1-15 Credits**

This course is for Ph.D. students before they have completed qualifiers. Consent of Instructor required. Thesis/Dissertation Grading.

Prerequisite(s): ANSC 421 or consent of instructor.

ANSC 602. Advanced Reproductive Physiology (fo)**3 Credits (3)**

Mechanisms of reproductive function; research methodology.

Prerequisite(s): ANSC 421 or consent of instructor.

ANSC 602 L. Molecular Techniques in Reproductive Physiology (fo)**2 Credits (4P)**

Molecular biology techniques used in the study of reproductive physiology in domestic animals. Extraction of RNA, DNA from endocrine tissues, northern analysis, culture of pituitary/ovarian tissue. Mechanisms of hormone action.

Prerequisite: consent of instructor.

ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)**1 Credit (1)**

Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis.

Prerequisite: ANSC 509.

ANSC 605. Gonadal and Uterine Endocrinology (fe)**1 Credit (1)**

Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts.

Prerequisite: ANSC 509.

ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe)**1 Credit (1)**

Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals.

Prerequisite: ANSC 509.

ANSC 621. Metabolic Functions and Dysfunctions (fe)**3 Credits (3)**

Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology.

Prerequisites: CHEM 345 and ANSC 501.

ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism (fo)**4 Credits (4)**

Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants.

Prerequisite: ANSC 501.

ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics (se)**4 Credits (4)**

Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use.

Prerequisite: ANSC 501.

ANSC 698. Special Research Programs**1-4 Credits**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 700. Doctoral Dissertation**15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

ANTH-ANTHROPOLOGY

ANTH 1115G. Introduction to Anthropology

3 Credits (3)

Anthropology is the systematic study of the humanity both past and present. The course introduces students to the four subfields of anthropology, which include archaeology, biological, linguistic and cultural anthropology. Students will learn about the concepts and methods that anthropologists use to study our species and gain a broader perspective on the human experience.

Learning Outcomes

1. Describe and summarize terms, approaches, and cultural and biological adaptations in the four subfields of anthropology.
2. Explain and analyze conceptual and ethical arguments in the four subfields of anthropology.
3. Effectively communicate content, perspectives, and ideas in four subfields of anthropology.
4. Critically evaluate sources, approaches, and arguments in the four subfields of anthropology.

ANTH 1135G. Introduction to Biological Anthropology

3 Credits (3)

This course provides a basic introduction to the broad field of biological anthropology. The research interests of biological anthropologists include the history and development of modern evolutionary biology, molecular and population genetics, modern primates, the primate and human fossil record, and modern human biological diversity.

Corequisite(s): ANTH 1135L.

Learning Outcomes

1. Summarize the basic principles of evolution and recognize how they apply to the human species.
2. Recognize the biological and behavioral continuity of humans with all life, and especially other modern primate species.
3. Identify ways in which the human species is biologically and behaviorally unique.
4. Summarize fossil evidence for human evolution.
5. Distinguish the major Paleolithic industries and outline the behavioral and cognitive changes indicated by the fossil and archeological evidence.
6. Critically evaluate popular accounts of human variation and human evolution.
7. Interpret modern human dilemmas (e.g., overpopulation, co-evolution of disease, and genetic engineering) from an evolutionary perspective.
8. Discuss in class and analyze in writing scholarly arguments concerning course concepts.

ANTH 1135L. Introduction to Biological Anthropology Lab

1 Credit (2P)

This laboratory course expand on the topics covered in lecture course and uses scientific methods and principles to examine evidence for the process of evolution, the nature of heredity, human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity. Hands-on experience with fossil and skeletal material will be an important part of the learning process. Corequisite(s): ANTH 1135G

Learning Outcomes

1. Demonstrate an understanding of the scientific method.
2. Employ principles of Mendelian genetics to determine genotype and phenotype probabilities, and calculate gene, genotype, and phenotype frequencies using the Hardy-Weinberg Equilibrium formula.
3. Demonstrate an understanding of cell structure and functions.
4. Use common lab and anthropometric equipment such as a compound microscope and calipers.
5. Discuss primate evolution, and compare and contrast members of the Primate order in terms of structure, behavior, and phylogeny.
6. Classify hominid species based upon selected traits such as anatomical changes associated with bipedalism, changes in the size and structure of the brain, and the development of culture.
7. Locate and describe the major bones of the human skeleton, and identify characteristics of human skeletons or skulls such as gender, age, and ancestry.
8. Discuss current research in genome analysis of various hominid populations.

ANTH 1136. Introduction to Historic Preservation

3 Credits (3)

Introduction to historic preservation, its history, goals, methods, legal basis, and economic importance. Explores public role in decision-making. Community Colleges only.

Learning Outcomes

1. Understand why historic preservation is important;
2. be familiar with what is important to preserve;
3. know who among the general public, state, and federal governments is responsible for preserving the past;
4. Have gained experience in how we all preserve.

ANTH 1137G. Human Ancestors

3 Credits (3)

Evolutionary history of the human species from its origin in the primate order, with primary emphasis on the evolution of humankind during the past three million years. Examination of the social lives of apes and consideration of similarities to and differences from them. Biological foundations of human behavior, emphasizing thought, movement, and interaction.

Learning Outcomes

1. Describe the evolution of the human species, from its origin in the primate order to the emergence of Homo sapiens, and to the present-day.
2. Describe the social lives of apes and identify similarities to and differences between apes and humans.
3. Explain the biological foundations of human behavior.

ANTH 1140G. Introduction to Cultural Anthropology**3 Credits (3)**

This is an introductory course that provides an overview of cultural anthropology as a subfield within the broader discipline of anthropology and as a research approach within the social sciences more generally. The course presents core concepts and methods of cultural anthropology that are used to understand the ways in which human beings organize and experience their lives through distinctive cultural practices. More specifically, this course explores social and cultural differences and similarities around the world through a variety of topics such as: language and communication, economics, ways of making a living, marriage and family, kinship and descent, race, ethnicity, political organization, supernatural beliefs, sex and gender, and globalization. This course ultimately aims to present a broad range of perspectives and practices of various cultural groups from across the globe. May be repeated up to 3 credits.

Learning Outcomes

1. Introduce students to the basic concepts and research methods of cultural anthropology as one of the disciplines of social science, including fundamental concepts, such as culture and society, which form the pillars of the discipline (e.g., cultural relativism, cultural persistence and change, world-view and enculturation).
2. Comprehend the importance of studying cultural anthropology.
3. Demonstrate knowledge of the practice of anthropological research in the modern world that is increasingly multicultural, transnational and globally interconnected (e.g., globalization and modern world system).
4. Demonstrate an awareness of how students' own cultures shape their experiences and the way they see the world, as well as help them understand and interact with other cultures.
5. Understand how beliefs, values and assumptions are influenced by culture, biology, history, economic, and social structures.
6. Gain a sense of relationship with people possessing different experiences from their own.
7. Gain a deeper understanding and appreciation for cultural anthropology as a broad discipline through learning about its practices, and differentiating cultural anthropology from other disciplines that study people
8. Become more sensitive and engaged global citizens from culturally relative perspectives.

ANTH 1160G. World Archaeology**3 Credits (3)**

This course is an exploration of human evolution and cultural development throughout the world. Students will be introduced to basic anthropological methods and theories and will learn how anthropological research has contributed to our understanding of major themes in human prehistory, including human evolution, the origins of culture, migration and colonization, animal and plant domestication, and the rise and fall of civilizations.

Learning Outcomes

1. Describe and explain the major developments in human prehistory.
2. Identify and describe major archaeological cultures throughout the world.
3. Employ critical thinking skills in the evaluation of competing theories about the past.
4. Select and use relevant archaeological evidence to explain how prehistoric populations adapted to their natural and cultural environments.
5. Demonstrate competency in written communication.

ANTH 2140G. Indigenous Peoples of North America**3 Credits (3)**

This course is a general survey of the history and ethnology of indigenous groups in North America. The course is designed to give students a comprehensive view of major issues pertaining to the indigenous cultures of North America, such as family structure, social organization, subsistence and contemporary economies, environmental adaptation, Indian-White relations, religious practices, and contemporary issues.

Learning Outcomes

1. Demonstrate familiarity with common elements pertaining to the languages and social organization of indigenous peoples in North America.
2. Recognize fundamental differences and similarities among traditional indigenous cultures.
3. Describe social relations of indigenous peoples in relationship to other ethnic groups.
4. Identify and analyze important ways that European societies and cultures and indigenous societies and cultures interacted from the time of Columbus to the present.
5. Evaluate the impacts of Euroamerican policies and programs on indigenous cultures.
6. Distinguish major social issues facing contemporary indigenous communities in North America.
7. Understand objectives and limitations of cross-cultural analysis in anthropology as they relate to the study of indigenous peoples in North America.
8. Demonstrate research and communication skills as they relate to the study of indigenous peoples in North America.

ANTH 2996. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

ANTH 301. Cultural Anthropology**3 Credits (3)**

The course will introduce students to the basic concepts and methods in cultural anthropology, focusing on the critical role of culture in traditional society and in the modern world. We apply the anthropological perspective to study the components of cultural systems, including language and meaning, ways of making a living, kinship, worldview, power and political systems, and socio-cultural inequalities, among others, across different cultures. By “unpacking” culture, we focus on how local knowledge is put to work in grappling with practical problems of everyday life. May be repeated up to 3 credits.

Learning Outcomes

1. Students will explain the core concepts in cultural anthropology, including the complexities, contradictions, dynamics, and implications.
2. Students will identify the important methods of fieldwork, linking theory to application.
3. Students will explain the critical components of cultural systems and how they operate, comparing and contrasting their different manifestations across different cultures. This identification should also address the complexities, dynamics, and implications.
4. Students will develop anthropological field skills in carrying out field projects, analyzing observed practices, symbols, and activities.
5. Students will identify and explain factors that explain cultural persistence and the relevance of culture in the modern world.

ANTH 305V. Contemporary Native Americans**3 Credits (3)**

Introduction to contemporary native peoples and cultures of North America. Emphasis on sociocultural and socioeconomic history, sociocultural change and persistence, present day reservation life, and current social and economic goals.

Learning Outcomes

1. Identify the major challenges within American Indian communities.
2. Analyze the components and causes of contemporary issues in Indian country.
3. Understand and be able to define sovereignty and self-determination and the relationship of Native nations to the U.S. government.
4. Develop an awareness of the historical and continuing efforts of resistance, adaptation, and endurance of Native peoples.
5. Integrate learned concepts to address contemporary Native American issues.
6. Possess foundation knowledge as preparation for higher-level coursework in NATV.

ANTH 306V. Peoples of Latin America**3 Credits (3)**

The course presents an overview of different cultures in Latin America, covering a range of topics including history, environment, race and ethnicity, religion, health, music, food, popular culture, globalization, and violence. Within this context, the perspective of cultural anthropology looks at the commonality of patterns shared across Latin America, at the same time that we examine the construction of cultural diversity, a diversity that has persisted into the modern era. We also examine how different Latin American peoples use culture, i.e., through their food, music, religion, and politics among other elements, as a way of shaping and conserving their ethnic identity. The class includes a mixture of lecture, discussion, films, music, and good food...

Learning Outcomes

1. Students will explain the major prehistoric Latin American civilizations and their role in shaping distinctive modern cultures today.
2. Students will identify the major ecological zones in Latin America and corresponding cultural adaptations and subsistence strategies.
3. Students will explain the critical role of economic and political history throughout the Colonial Period and Independence in shaping the patterns of cultural diversity, racial boundaries, and ethnic identities.
4. Students will explain the role of cultural practices (such as religion, music, popular culture, and foodways) in supporting indigenous and minority populations' efforts to retain distinct cultural identities.
5. Students will explain the global and historical connections between Latin American and the United States, in particular the role that Latin American culture, migration, and traditions have played in shaping our society's development.

ANTH 307V. Japanese Culture and Society: Anthropological Perspectives**3 Credits (3)**

This course introduces students to Japanese culture from anthropological and philosophical perspective. Learning about Japanese culture (non-Western) enhances students' awareness of the diversity of human values, beliefs, and morals and provides an understanding of cultural differences outside of mainstream American culture.

Learning Outcomes

1. Take a position on an anthropological theory that accounts for how and why Japanese culture has changed through time.
2. Select and integrate relevant anthropological perspectives to argue for or against ethical and moral differences between American and Japanese cultures.
3. Analyze social, political, and religious aspects in Japanese society and compare them with those in America.
4. Investigate sociopolitical and economic status of minority groups in Japan using anthropological approaches and compare them with those of America.
5. Engage in face-to-face interactions with Japanese people in southern New Mexico and discuss similarities and differences between cultures, values, and worldview.

ANTH 312. The Ancient Maya**3 Credits (3)**

Archaeological evidence of culture change in the Maya civilizations of Mexico and Central America from 2000 BC to the Spanish Conquest.

ANTH 313V. Ancient Mexico**3 Credits (3)**

We will explore the archaeology the Aztecs, Zapotecs, and the Maya of Mexico and Central America from 3000BC up to and including the Spanish invasion of 1519-1521. We will examine how the legacies of these great civilizations were erased from written sources and how Mesoamerican heritage can be preserved and reclaimed for descendant communities and the public using archaeological remains. We will address: (1). the origins of agriculture and traditional food systems in Mesoamerica; (2). the rise of cities and urban centers; (3). writing, religion, social inequality, and the circulation of commodities; (4). Political disintegration, fragmentation, and collapse; (5). the formation and expansion of the Aztec and Tarascan empires; and (6). the consequences of the Spanish invasion and colonialism.

Learning Outcomes

1. Take a position on theories that explain how, when, and why human lifeways changed in ancient Mesoamerica.
2. Select and integrate relevant archaeological evidence to argue for and against a theoretical position.
3. Analyze the significance of sites, structures, artifacts, and ecofacts within their archaeological contexts and explain their relevance for people today.
4. Evaluate how practices in research, conservation, and tourism to archaeological sites promote stewardship of non-renewable archaeological resources and intangible heritage.
5. Critique and reflect on designs for virtual public tours of archaeological sites in Mexico or Central America and suggest improvements to best practices for the preservation and public presentation of archaeological resources.

ANTH 315. Introduction to Archaeology**3 Credits (3)**

This course introduces you to the discipline of archaeology, situating this discipline within the wider field of anthropology. The first part of the course presents a brief history of the discipline, introduces some foundational concepts, and explains common field research methods. The second part of the class takes you through the process of identifying, classifying, and interpreting archaeological materials. The third and final part of the class introduces you to different research areas and types of professional work within archaeology. May be repeated up to 3 credits.

Learning Outcomes

1. Identify major figures, sites, and trends in the history of archaeology
2. Identify and describe common field and laboratory methods used in archaeology
3. Construct and critically evaluate material culture typologies
4. Explain and provide examples of different models of archaeological inference
5. Describe and apply different theoretical approaches to the study of the human past
6. Identify and describe significant areas of archaeological research and work

ANTH 318. Historical Archaeology**3 Credits (3)**

This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 518.

Learning Outcomes

1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 320. Anthropological Linguistics**3 Credits (3)**

The study of language and culture with particular emphasis on the cultural factors in the communication process.

ANTH 330V. Magic Witchcraft and Religion**3 Credits (3)**

Provides an introduction to method and theory for the study of religion, ritual, and spiritual practice. Review and discussion of case studies drawn from around the globe to enhance understanding of the varied ways that people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends.

Learning Outcomes

1. Define and identify examples of magic, science, witchcraft, and religion. Develop an understanding of the variation in cultural and behavioral practices associated with each.
2. Develop knowledge and critique early approaches and concepts in the anthropology of religion and its role in explanations of cultural change.
3. Develop knowledge of variation in religion as a cultural system and the experiences of liminality in rites of passage.
4. Identify the statuses and roles of various kinds of religious practitioners and their positionalities vis a vis dominant and resistant ideologies and structural inequality.
5. Develop critical thinking skills that speak to the relevance of different forms of religious thought and ritual practice in our daily lives.

ANTH 345. Introduction to Museology**3 Credits (3)**

This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.

Learning Outcomes

1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 347. Museum Confidential**3 Credits (3)**

This course will introduce students to many of the fundamental concepts behind the creation of a museum exhibition. Drawing from the extensive permanent collection of the University Museum, housed in the basement of Kent Hall, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition in the west gallery of the Museum. By turning the museum inside-out, this course will be a unique behind-the-scenes experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the cabinet of curiosity and wunderkammer, to readymades and Mark Dion's re-imagined museums. Crosslisted with: ANTH 547.

Learning Outcomes

1. Explain the basic concepts and terminology of the museum
2. Differentiate the functions, roles, duties and responsibilities of museums
3. Describe the types of museums and their historical development
4. Discuss the challenges and responsibilities that museums and their staff members encounter, most especially in collections
5. Employ the fundamental principles and practices of museum documentation (knowledge of deaccessioning and the challenges faced by museum and inherited collections)
6. Apply the fundamental principles and practices of collection management
7. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator

ANTH 349. Museum Anthropology**3 Credits (3)**

This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.

Learning Outcomes

1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 350. Anthropological Theory**3 Credits (3)**

This course introduces students to historical and contemporary theory in anthropology with a focus on understanding why theory matters in our discipline. Key questions the course explores include: How have anthropologists thought about the concept of culture in different ways throughout the history of anthropology? What is the relevance of anthropological theory, both inside and outside the discipline? What new and promising trajectories do we see in anthropological theory today? May be repeated up to 3 credits.

Learning Outcomes

1. Trace the history of anthropological theory. You will recognize major figures and schools of thought in anthropological theory and be able to articulate their contributions to the field.
2. Critically analyze anthropological concepts of culture. Throughout the course, you will hone analysis skills through discussing and critiquing various anthropological perspectives on the culture concept.
3. Apply anthropological theory to contemporary anthropological "problems". Throughout the course, you will reflect on the usefulness of anthropological theory to the field and beyond. You will be able to articulate the connections made through writing and class discussion.

ANTH 355. Biological Anthropology**3 Credits (3)**

An introduction to the fundamentals of the scientific method and organic evolution specific to the study of human origins and contemporary biological variation. Non-human primate diversity and behavior are also considered.

Learning Outcomes

1. Increase scientific literacy.
2. Improve specific skill areas including: Critical thinking; Expository writing; Analytical reading; Oral presentation skills.
3. Establish foundational knowledge as a basis for further study in: Evolutionary theory; Human variation and adaptation; Primatology; Human origins and evolution.

ANTH 356. Forensic Anthropology**3 Credits (3)**

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Learn about the scientific method and how to apply scientific findings to field work.
2. Learn about the history and applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Learn to identify human bones and the process of building a biological profile of human remains.
5. Learn about decomposition and how forensic anthropologists process and interpret crime scenes.

ANTH 357V. Medical Anthropology**3 Credits (3)**

This course introduces students to evolutionary, ecological, interpretive, political-economic, and applied anthropological perspectives on health, illness, and healing to address some of the major questions in the field. How do humans adapt to changing environments that bring with them new illnesses and diseases? How do anthropologists understand the multiple meanings of health and illness cross-culturally? How can anthropologists effectively study health inequalities? What can medical anthropological perspectives contribute to addressing the health issues that we face in our current global context?

Learning Outcomes

1. Explain medical anthropology to someone unfamiliar with the field. Meeting this goal requires that you are able to: Define medical anthropology; Define health, illness, sickness, disease, and healing; Explain basic research methods in medical anthropology; Identify the different perspectives within medical anthropology.
2. Evaluate health problems from medical anthropological perspectives. Meeting this goal requires that you are able to: Accomplish goal
3. Identify different medical anthropological perspectives in research and reporting on health problems; Identify what is missing (based on your knowledge of medical anthropological perspectives) in addition to what is present in research and reporting on health problems.
4. Apply medical anthropological perspectives to current health problems. Meeting this goal requires that you are able to: Accomplish goals 1 and 2; Develop deeper understanding of medical anthropological perspectives by formulating "in your own words" definitions of medical anthropological perspectives; Identify multiple facets of major health issues.

ANTH 360V. Food and Culture Around the World**3 Credits (3)**

Study of the interaction between food and human culture from an anthropological perspective. Examines the traditional role of food in local economies, social relations, and identity around the world. Also examines the impact of globalization on traditional food systems and cultures.

ANTH 362V. Environmental Anthropology**3 Credits (3)**

This course examines environmental studies from an anthropological perspective. The class focuses on how cultural values mediate environmental management. The class covers topics such as environmental anthropology, large scale development, biodiversity conservation, sustainable development, indigenous groups, consumption, and globalization.

Learning Outcomes

1. Students will understand the impact of cultural values on how humans interact with the environment.
2. Students will understand how different cultural perspectives can be used to address environmental problems.
3. Students will critically reflect on their own environmental values and recognize how these values are shaped by our own culture.

ANTH 375. Pottery Analysis in Archaeology**3 Credits (3)**

This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 575.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 376. Lithic Technology Organization**3 Credits (3)**

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data.

Prerequisite(s): ANTH 315.

ANTH 378. Introduction to Lab Methods in Archaeology**3 Credits (3)**

Introduction to laboratory techniques used in the analysis of archaeological materials.

Learning Outcomes

1. Identify different categories and types of archaeological materials.
2. Employ common methods for analyzing material culture.
3. Explain how research design determines analytical methods and shapes interpretations.
4. Discuss our ethical obligation to preserve collections for future researchers, while recognizing the challenges involved in this endeavor.

ANTH 385. Internship in Anthropology**3-12 Credits (3-12)**

Applied or field experience to gain professional expertise. Placements with public agencies, NGOs, or research organizations. Topical focus tailored to student's individual needs through consultation with instructor.

Prerequisite(s): Junior status, consent of instructor and GPA 2.8 or better.

ANTH 388. Intermediate Archaeological Field School**2-6 Credits (2-6P)**

Training in archaeological field methods, including excavation of archaeological sites, mapping, and data management and analysis.

Consent of Instructor required.

Learning Outcomes

1. Map sites/site features using a compass and tape, GPS unit, and total station/RTK GNSS receiver.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 389. Archaeological Mapping**3 Credits (3)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.

Learning Outcomes

1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 399. Professionalism & Practice in Anthropology **3 Credits (3)**

This course serves as a capstone for Anthropology majors. It offers students a writing focused opportunity to hone professional anthropological skills including critical thinking and communication strategies. All communication takes a position; it makes an argument. Students will learn and practice these skills through writing, rewriting and then rewriting again a research paper, a curriculum vitae/resume, employment letters of inquiry, and graduate school letters of inquiry. Restricted to Anthropology Majors. May be repeated up to 3 credits.

Learning Outcomes

1. Learn and practice written communication these skills through writing, rewriting and then rewriting again a research paper,
2. Learn and practice professional verbal and visual communications through research presentations, job interviews and elevator speeches
3. Identify and use anthropologically informed ethical responsibilities that pervade written, verbal and visual communication skills (e.g., goals for use of information, use of accurate information, protection of sources of information, honest attribution of credit to sources of scholarly work, sensitivity to others cultural traditions);

ANTH 402. Contemporary Medical Anthropology **3 Credits (3)**

Contemporary Medical Anthropology This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 546.

Prerequisite(s): ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.

Learning Outcomes

1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 414. The Archaeology of Religion **3 Credits (3)**

The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 415. Applied Anthropology **3 Credits (3)**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 515.

ANTH 419. Topics in Prehistoric Archaeology **3 Credits (3)**

Specific subjects in prehistoric archaeology as announced in the Schedule of Classes. May be repeated up to 6 credits.

ANTH 431V. Nutritional Anthropology **3 Credits (3)**

This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.

Learning Outcomes

1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 433V. Sex, Gender and Culture **3 Credits (3)**

This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc., expand our understanding of the various ways gender is defined across space and time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

ANTH 435. Human Health and Biological Variation**3 Credits (3)**

Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 535.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 436. Evolutionary Medicine**3 Credits (3)**

This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.

Learning Outcomes

1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 449. Directed Reading**1-6 Credits**

Comprehensive reading on selected topics. May be repeated for a maximum of 6 credits.

Prerequisite(s): Upper division anthropology majors with consent of instructor.

ANTH 449 H. Directed Reading Honors**1-3 Credits**

Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.

ANTH 456. Native American Intersections in Museums**3 Credits (3)**

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 556.

ANTH 458. Fertility, Reproduction and Birth**3 Credits (3)**

This course examines biocultural variation in reproductive health and birth practices, with topics such as gendered roles and responsibilities, pregnancy and birth as rites of passage, cultural concepts of personhood, global family planning initiatives, the medicalization of pregnancy and birth, developing reproductive technologies, and reproductive health disparities.

Prerequisite: ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.

Learning Outcomes

1. Identify multiple anthropological perspectives on sex, reproduction, and birth. Anthropologists approach questions about human sex, reproduction, and birth in a variety of ways. You will be able to identify and discuss some major perspectives in this area.
2. Critically analyze anthropological concepts of sex, reproduction, and birth. This course focuses on discussion of anthropological ideas about sex, reproduction, and birth. Not all fully agree with one another nor do they all fully answer the questions you may have. You should approach the materials we read and discuss from a critical angle.
3. Apply anthropological concepts about sex, reproduction, and birth to contemporary anthropological "problems" Throughout the course, you will reflect on the usefulness of different perspectives on sex, reproduction and birth to address current issues that we face in our globalized world.

ANTH 463. Cultural Resource Management I**3 Credits (3)**

This course introduces you to the field of cultural resource management (CRM) and to the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Class lectures, readings, and written assignments will cover the major relevant US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on understanding how to evaluate and nominate cultural resources for listing on the National Register of Historic Places (NRHP). Good oral and written communication skills are essential for success in CRM, so students will be provided with numerous opportunities to develop these skills in class.

Learning Outcomes

1. Explain the goals of cultural resource management (CRM)
2. Describe the major laws and regulations that govern CRM in the United States, in the state of New Mexico, and abroad
3. Identify some common challenges with implementing these laws and regulations
4. Determine the eligibility of cultural resources for listing on the NRHP, and justify this determination

ANTH 464. Curation Crisis in Archaeology**3 Credits (3)**

This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#“crisis”#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.

Learning Outcomes

1. Learn about the maintenance of archaeological collections
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about various ways of disseminating archaeological collections to the public
6. Change the perception of the “just digging and we will deal with the collections later” approach.

ANTH 467. Archaeology of the American Southwest**3 Credits (3)**

Description and analysis of the archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures.

Prerequisite: ANTH 315.

Learning Outcomes

1. Learn the culture history of the American Southwest from the Ice-Age through the Spanish Colonial Period.
2. Students will learn the advances in archaeological method and theory developed in the American Southwest such as Tree-ring dating, Pottery Seriation, Paleoindian Archaeology.
3. Students will develop a research interest in the region through a paper specializing in a theme and subregion e.g. Architectural change in the four corners during the 13th century, the adoption of corn in the Late archaic borderlands of southern New Mexico.

ANTH 468. Applied Medical Anthropology**3 Credits (3)**

This course introduces students to applications of medical anthropological perspectives to health care, international development, public health, and health policy.

Learning Outcomes

1. Discuss the usefulness of anthropological perspectives in addressing health issues in a variety of interdisciplinary and professional settings.
2. Assess the health impact of public policy from anthropological perspective.

ANTH 472. Primate Behavior and Ecology**3 Credits (3)**

Survey of the social behavior and ecology of nonhuman primates. Crosslisted with: BIOL 472.

ANTH 474. Human Osteology**3 Credits (3)**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 424.

ANTH 474 L. Human Osteology Lab**1 Credit (1P)**

Laboratory for ANTH 474. Experiences and activities related to identifying teeth and bones of the human skeleton. Students are recommend to take ANTH 355 or an equivalent before enrolling in this course. Crosslisted with: BIOL 424 L.

Corequisite(s): ANTH 474.

ANTH 477. Zooarchaeology**3 Credits (3)**

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. May be repeated up to 3 credits.

ANTH 485. Special Research Project**1-3 Credits**

Anthropological, archaeological, or museum field work or laboratory experience in academic, private, state, or federal agencies. Must spend 30 hours in a field, museum, or laboratory setting per credit hour earned. May be repeated up to 6 credits.

Prerequisite(s): Complete 12 ANTH credits and consent of instructor.

ANTH 486. Community Engagement and Service Learning**3 Credits (3)**

Course combines classroom instruction with a local community service project. Formal instruction component will examine social science research findings and perspectives on a locally relevant social issue or problem. In the service learning component, students will be trained and work on a local community service project. Students will develop field experience and methodological skills in community engagement. Projects and social issues may vary for different semesters.

ANTH 488. Archaeological Field School Advanced**2-6 Credits (2-6P)**

Additional training in archaeological field methods for students with previous fieldwork experience. Consent of Instructor required.

Learning Outcomes

1. Map sites/site features using a compass and tape, GPS unit, and total station/RTK GNSS receiver.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 497. Special Topics**1-6 Credits (1-6)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite(s): Junior or above standing.

ANTH 500. Seminar in Anthropological Theory**3 Credits (3)**

Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 502. Fundamentals of Anthropology**1-4 Credits (1-4)**

Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. Graded S/U.

ANTH 503. Anthropological Theory**3 Credits (3)**

This seminar is designed to introduce graduate students to the major concepts and developments in anthropological theory. Students will develop an understanding of the major principles, contributions, and limitations of anthropological theory from the 1890s to the present. The course will address theoretical developments in biological anthropology, sociocultural anthropology, archaeology, and public and applied anthropology.

Learning Outcomes

1. Articulate the history of theoretical developments in multiple anthropological subfields and explain the holistic connections among them.
2. Explain and critique the major theoretical formulations of the field, including: human biological evolution and variation; cultural relativism; practice theory; life history and formation processes of archaeological, paleontological, and contemporary sites and specimens; historical contingency in culture change and globalization; human ecology and environmental anthropology, past and present; indigenous perspectives, participatory action research, and collaborative research designs; identity and the intersections of gender, sex, race, class, and other categories, past and present; origins and contemporary variation of inequality and socioeconomic disparities; political economy, domination and resistance, past and present; the development and critique of diverse narratives of the past drawn from archaeological/material, visual and performative, documentary, and oral historical media; stewardship of tangible and intangible cultural heritage,
3. Read and practice in the norms of written and verbal expression across multiple theoretical domains in anthropology.

ANTH 505. Issues in Anthropological Practice**3 Credits (3)**

This is a course in professional development in which students design their thesis/non-thesis research projects and write a first draft of their capstone research proposal. The purpose is to connect the MA thesis or non-thesis research project to your future career. Professionals in anthropology should demonstrate competency in research and writing by completing an M.A. thesis or qualification equivalent (e.g. internship report, research report, which increasingly include public scholarship and the development of creative digital media). Successful completion of an original research project demonstrates that a student can conduct applied and collaborative research, complete a scope of work according to standards and guidelines of the agency, institution, or organization, and evaluate the research and contributions of colleagues and peers. Anthropologists are all called to participate in the investigation, management, and evaluation of cultural resources (tangible and intangible), address the intersectionalities within organizations and institutions that differentially impact social groups, and work with individuals and communities to achieve shared objectives that enhance engagement.

Learning Outcomes

1. Students will develop and implement a research project in anthropology. We will focus on research design—from defining the research problem, funding, lit review, logistics of fieldwork, analysis, and write-up. Students will move from exploring a topic of interest to developing a proposal for investigation.
2. Students will develop professional skills, ethics, values, and attitudes necessary for developing and implementing a research project and for employment in the field. They will map out a pathway to a career in anthropology. We will examine anthropological practice in academic and applied contexts. We will consider expectations and qualifications needed for different work environments and degree programs. Students will work towards matching NMSU's MA curriculum to their professional goals. You should make the curriculum and university resources work for you.

ANTH 506. Advanced Studies in Physical Anthropology**1-3 Credits**

Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 507. Advanced Studies in Archaeology**1-3 Credits**

Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 508. Advanced Studies in Cultural Anthropology**1-3 Credits**

Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.

Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 512. Quantitative Analytical Methods in Anthropology **3 Credits (3)**

This class is an introduction to statistical analysis of anthropological and social science data. Students will learn how quantitative and statistical techniques are used in the analysis of anthropological problems and how to evaluate statistical arguments in the literature. No previous background in statistics is required. We will consider data collection, sampling and statistical populations, exploratory summaries of data, and the importance of choosing appropriate statistical techniques. All course work will emphasize anthropological interpretation through applied statistical methods. The course has a four-field focus (archaeology, biological anthropology, cultural anthropology, and linguistics), and students will work with readings, examples, and problem assignments from each subfield.

Learning Outcomes

1. Articulate the difference between descriptive and inferential statistics.
2. Explain the difference between a population and a sample and learn how to draw random samples (various methods – simple random, stratified, systematic, etc.) in the field and using numerical data and statistical procedures within SAS or other STATPACKS (SPSS, R).
3. Use appropriate graphs, tables, and measures of central tendency and dispersion to display and summarize distributions of nominal, ordinal, interval and ratio level data.
4. Understand the Normal Distribution and the assumptions required for hypothesis testing.
5. Perform hypothesis testing and interpret the results for univariate, bivariate, and multivariate statistical procedures, including Chi Square, T-tests, Non-parametric Comparison tests, ANOVA, Correlation, Simple Linear Regression, Multiple Regression, Cluster and Discriminant Analysis (as time permits).
6. Develop an exploratory statistical analysis for original anthropological data and write a final paper interpreting the results.

ANTH 514. Advanced Issues in the Archaeology of Religion **3 Credits (3)**

The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology and be required to lead class discussions.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 515. Applied Anthropology **3 Credits (3)**

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.

ANTH 516. Advanced Archaeology of the American Southwest **3 Credits (3)**

Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.

Learning Outcomes

1. Students will have an advanced understanding of the changes in subsistence, social organization, and material culture in the American Southwest from the Ice Age through the Spanish Entrada.
2. Students will understand the history of archaeological method and theory as it played out in the archaeology of the American Southwest. They will recognize that theory determines the questions asked about the ancient peoples of the region.
3. Graduate students will write a term paper (professional technical and scientific writing) that contributes to their MA projects either directly as part of a specific thesis or as extension of their interest in a topic (e.g., identity, domestication, ritual violence) or method (e.g., pottery sourcing, faunal analysis).

ANTH 517. Advanced Topics in Mesoamerican Archaeology **3 Credits (3)**

Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

Prerequisite: graduate standing.

ANTH 518. Advanced Historical Archaeology **3 Credits (3)**

This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 318.

Learning Outcomes

1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 519. Advanced Topics in Prehistoric Archaeology **3 Credits (3)**

Seminar on specialized research archaeology.

Prerequisite: graduate standing.

ANTH 520. Ethnographic Field Methods **3 Credits (3)**

Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.

ANTH 522. Archaeological Field School-Graduates**2-6 Credits (2-6P)**

Graduate-level training in archaeological field methods, including excavation, survey, mapping, documentation, and processing/analysis of data. Consent of Instructor required.

Learning Outcomes

1. Map sites/site features using a compass and tape, GPS unit, and total station/RTK GNSS receiver.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Process archaeological materials safely so that they can be analyzed in a laboratory environment.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 523. Archaeological Mapping**3 Credits (3)**

Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.

Learning Outcomes

1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 529. Advanced Evolutionary Medicine**3 Credits (3)**

This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.

Learning Outcomes

1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 531. Issues in Nutritional Anthropology**3 Credits (3)**

This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.

Learning Outcomes

1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 533. Advanced Issues in Sex, Gender, and Culture**3 Credits (3)**

Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

ANTH 535. Adv. Human Health and Biological Variation**3 Credits (3)**

Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 435.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 538. Plants, Culture, and Sustainable Development**3 Credits (3)**

Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnoecology, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.

ANTH 539. Culture and Foodways**3 Credits (3)**

Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.

ANTH 540. Cultural Resource Management**3 Credits (3)**

Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.

ANTH 541. Advanced Indigenizing Methodologies in Native American Studies**3 Credits (3)**

This course utilizes indigenizing methodologies and praxis to gain insight into the complex effects of oppression and colonization. Critical and indigenous concepts are used to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Research theory and methodology such as community participatory action research that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people is emphasized.

Learning Outcomes

1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

ANTH 542. Cultural Resource Management II**3 Credits (3)**

Continuation of ANTH 540. This course introduces students to the business and practice of doing contractual cultural resource management in the United States.

Learning Outcomes

1. Map an archaeological site (meeting New Mexico state standards for archaeological survey)
2. Document an archaeological site (using a Laboratory of Anthropology site form)
3. Prepare a written site description suitable for inclusion in a survey report
4. Analyze and present data using relevant software (e.g., Excel, Access)
5. Prepare a research proposal or report (meeting New Mexico state standards)

ANTH 543. Indigenous Ways of Knowing**3 Credits (3)**

This course examines Indigenous knowledge and ways of knowing as a means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather than comparative analysis.

Learning Outcomes**ANTH 545. Advanced Museology****3 Credits (3)**

This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.

Learning Outcomes

1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 546. Advanced Contemporary Medical Anthropology**3 Credits (3)**

This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 402.

Learning Outcomes

1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 547. Museum Field Methods**3 Credits (3)**

This course will introduce students to many of the fundamental concepts behind the creation of a museum exhibition. Drawing from the extensive permanent collection of the University Museum, housed in the basement of Kent Hall, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition in the west gallery of the Museum. By turning the museum inside-out, this course will be a unique behind-the-scenes experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the cabinet of curiosity and wunderkammer, to readymades and Mark Dion's re-imagined museums. Crosslisted with: ANTH 347.

Learning Outcomes

1. Explain the basic concepts and terminology of the museum
2. Differentiate the functions, roles, duties and responsibilities of museums
3. Describe the types of museums and their historical development
4. Discuss the challenges and responsibilities that museums and their staff members encounter, most especially in collections
5. Employ the fundamental principles and practices of museum documentation (knowledge of deaccessioning and the challenges faced by museum and inherited collections)
6. Apply the fundamental principles and practices of collection management
7. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator
8. Object handling and basics of preventive conservation

ANTH 549. Advanced Museum Anthropology**3 Credits (3)**

This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.

Learning Outcomes

1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 556. Advanced Native American Intersections in Museums
3 Credits (3)

This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 456.

ANTH 560. Advanced Forensic Anthropology
3 Credits (3)

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Understand how scientific findings from fields like biological anthropology are applied in forensic anthropology.
2. Understand the history and range of applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Gain a practical understanding of how forensic anthropologists identify human bones and the process of building a biological profile of human remains.
5. Understand processes like decomposition and recovery of remains at crime scenes.

ANTH 564. Advanced Curation Crisis in Archaeology
3 Credits (3)

This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation crisis using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.

Learning Outcomes

1. Learn about the maintenance of archaeological and repository collections over time
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about the development of a small as well as large archaeological database
6. Learn about various ways of disseminating archaeological collections to the public
7. Change the perception of the "just digging and we will deal with the collections later" approach.

ANTH 574. Advanced Human Osteology
3 Credits (3)

Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 574.

ANTH 575. Advanced Pottery Analysis in Archaeology
3 Credits (3)

This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 375.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 576. Lithic Technology Organization
3 Credits (3)

Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data. Consent of Instructor required.

ANTH 577. Advanced Zooarchaeology
3 Credits (3)

Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.

ANTH 578. Advanced Lab Methods in Archaeology
3 Credits (3)

Examination of advanced laboratory techniques used in the analysis of archaeological materials.

ANTH 579. Qualitative Data Analysis and Interpretation
3 Credits (3)

This course focuses on methods for qualitative data analysis, both computer-assisted and non-computer-assisted, and interpretation. It includes writing up data for academic articles or theses.

ANTH 585. Method and Theory in Archaeology
3 Credits (3)

Focus on major methodological and theoretical aspects of contemporary archaeology.

ANTH 587. Field Work in Latin America**3-12 Credits**

Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. No S/U grading.

Prerequisite: consent of instructor.

ANTH 596. Readings**1-6 Credits**

Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.

ANTH 597. Internship**1-9 Credits**

Anthropological or archaeological internship in private, state, or federal agency. May be repeated for a maximum of 18 credits. Consent of instructor required. Restricted to ANTH majors.

Prerequisite(s): graduate standing.

ANTH 598. Special Research Problems**1-6 Credits (6)**

Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required. Restricted to ANTH majors.

Prerequisite(s): graduate standing.

ANTH 599. Master's Thesis**1-15 Credits**

Thesis. Consent of instructor required. Restricted to ANTH majors.

Prerequisite(s): graduate standing.

ARCH-ARCHITECTURE

ARCH 1105. Orientation and Mentoring in Architecture-Construction-Engineering (ACE)**1-6 Credits (1-6)**

This course is intended for high school dual credit students and college/university students wishing to explore careers in Architecture, Construction, and Engineering (ACE), which includes the specific fields of Architectural, Civil, Mechanical, Structural, Interior, Landscape, Sustainability, and Environmental. Students receive one-on-one mentoring, attend field trips, and engage in hands-on activities. May be repeated up to 6 credits. Restricted to Community Colleges campuses

Learning Outcomes

1. Career opportunities related to 'ACE'
2. Career requirements: Education
3. Career requirements: Experience and/or examination(s)
4. Overview of construction/management
5. Overview of Architecture
6. Overview of Civil engineering
7. Overview of Surveying
8. Overview of Mechanical Engineering
9. Overview of Electrical Engineering 1
10. Overview of Landscape Architecture 1
11. Overview of Interior Design 1
12. Overview of Sustainable design 1
13. Overview of the Design Process 1
14. Basic Structural Specifications. 1
15. Structural drafting/detailing principles 1
16. AutoCAD applications: Sheet Layout, Drawing Standards, Efficiency, Speed, Accuracy 1
17. Structural CAD software applications 1
18. Sustainability in Structural Systems

ARCH 1110. Architectural Drawing**4 Credits (2+4P)**

This course is designed as an introduction to architectural drawing and design for students without prior experience in the fine arts. Students are guided through a series of spatial and analytical exercises that focus attention on not only how architects draw, but also the reasoning and processes embedded within the technique. Students are provided exposure to a wide range of interconnected architectural concepts and to manual and digital drawing, as well as modeling techniques for architectural and interior design. Students will learn how to represent composition, form, and space by orthographic drawing, paraline and perspective views, and freehand sketching. Three-dimensional model building techniques will also be introduced.

Learning Outcomes

1. Gain understanding of basic methods of architectural drawing
2. Explore and gain understanding of concepts of spatial design and its representation through exercises
3. That stress analytical ability and an awareness of rational design process
4. Gain an understanding of the design process with practice and various exercises
5. Gain exposure to architectural delineation
6. Demonstrate an understanding of specific skills and concepts related to architectural drawing
7. Create and modify architectural models through various phases of a project
8. Demonstrate a knowledge of graphic standards according to industry conventions
9. Identify the various phases of work with regard to the architectural and interior design professions
10. Develop analytical and critical thinking skills

ARCH 1112. Global Issues and Sustainability**3 Credits (3)**

Introduction to global environmental issues (historic, present, and future), and the impact on tomorrow's design and construction professions. Issues will include, but shall not be limited to global warming, energy consumption, population, natural resource consumption, air and water quality, waste management, facilities operation management, politics, and facilities design & construction. The impact on the design and construction industry, including 'Green Building' and 'LEED Accreditation and Certification/Criteria' will also be addressed. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Discover global environmental history to better understand sustainable topics and change your behavior in the future.
2. Expand your knowledge on environment, natural resource consumption, human intervention, politics, and design and construction industry to support your education and future careers.
3. Learn how the US Green Building Council LEED (Leadership in Energy and Environmental Design) certification and Accredited Professional training expands your knowledge on green building design criteria; will help you determine whether you want to take the LEED exam.
4. Examine the many sides of climate change and its effects on the globe as well as our individual microclimate and personal lives to learn how to adapt to the current changes
5. Learn how to effectively research, report, present, and debate environmental topics to help you in your education and future careers.

ARCH 1114. Introduction to Architectural Design**3 Credits (2+2P)**

This course provides students who possess a basic background in architecture and architectural drawing with an introduction to architectural design. Students are guided through a series of spatial and analytical exercises that focus attention on two dimensional, three dimensional, and four dimensional design. This course will build on direct linkages to ARCH 1120 and ARCH 1110 to further students' exposure to interconnected architectural concepts of process, organizational strategies, and analysis of material methodology while utilizing abstract and practiced graphical architectural conventions. Consent of Instructor required. Restricted to Community Colleges campuses only.

Prerequisite(s): ARCH 1120 and ARCH 1110.

Learning Outcomes

1. Develop critical thinking strategies through a series of connected exercises in order to explain, demonstrate, categorize, compare, contrast and assess information/evidence.
2. Explore concepts of design through spatial design and apply these concepts through a series of progressive representational exercises that stress analytical ability and an awareness of rational design process.
3. Gain skills in the application of graphical communication in a range of media.
4. Enhance abilities in selecting specific information and applying that information to problem solve issues/concerns required to complete a task, while considering other implications.
5. Develop skill sin writing and speaking effectively and use representational media appropriate for both within the profession and with the public.
6. Gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.
7. Utilize basic formal, organizational and environmental principles and the capacity of each to inform two- and three-dimensional design.
8. Apply fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three-dimensional design.
9. Demonstrate basic principles of structural systems and their ability to withstand gravitational, seismic, and lateral forces, as well as the selection and application of the appropriate structural system

ARCH 1120. Introduction to Architecture**3 Credits (2+2P)**

This course provides students the tools and vocabulary to analyze, interpret and discuss the built environment from the social, historical, perceptual and technical determinants. Students are introduced to elements, principles, and theories of architecture through their social, historical, and technical determinants. The course seeks to lay a foundation in architectural studies, including introducing students to fundamental vocabulary and concepts.

Learning Outcomes

1. Identify and describe significant architects and iconic buildings
2. Discuss social, cultural, and aesthetic contributions of specific architects and projects
3. Explain architectural concepts via written and graphic communication
4. Recall basic processes and vocabulary of architectural professional practice
5. Understand our built environment and the language of design and architecture
6. Understand how buildings are constructed and explain the process of development
7. Describe and discuss design elements, principles, and theories
8. Understand the relationships among owner, surveyors, designers, architects, engineers, and contractors
9. Research design texts and analyze buildings, landscapes, interiors, sustainability, and products to increase knowledge of important elements of architecture and design
10. Identify the various styles, periods, and movements and their social, historical, and technical impacts on architecture

ARCH 1121. Computers in Architecture**3 Credits (2+2P)**

Explore various software and photography techniques widely used in the architectural field. In addition to using industry standard CAD program as primary 2-d drafting tool, focus is to produce digital architectural models and renderings, presentation boards, and animations. Digital images will be produced and enhanced through basic techniques in photography and integration of various software. Both individual and group work will be required.

Learning Outcomes

1. Demonstrate the use of the computer and plotters/printers
2. Define and understand different terminologies
3. Demonstrate the understanding of different files using windows operating system
4. Understanding the appropriate use of the software in order to produce necessary drafting outcomes
5. Use proper plotting and printing procedures in order to increase efficiency and minimize paper waste
6. Demonstrating the use of different line types as the relate to drafting

ARCH 1122. Architectural Design Studio I**5 Credits (1+8P)**

Enhancement of general graphic communication skills and introduction to fundamental design including exploration, development and defense of design concepts; structural order; 2D and 3D processes in manual and digital architectural graphic expression; model building; general communication and presentation techniques; and development of course portfolio. Course is Studio/critique-based with considerable amount of work/hours required. This course is designed to be taken during student's last year in the Pre-Architecture program at DACC. Consent of Instructor required. Restricted to Community Colleges only.

Prerequisite(s): Grade of B- or better in both ARCH 1120 and ARCH 1110.

Learning Outcomes

1. Write and speak effectively and use representational media appropriate for both within the profession and with the general public.
2. Raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards
3. Gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.
4. Effectively use basic formal, organizational and environmental principles and the capacity of each to inform two-and three-dimensional design.
5. Apply the fundamentals of both natural and formal ordering systems and the capacity of each to inform two-and three-dimensional design.
6. Examine and comprehend the fundamental principles present in relevant precedents and to make informed choices about the incorporation of such principles into architecture and urban design projects.
7. Prepare a comprehensive program for an architectural project that includes an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.
8. Respond to site characteristics, including its context and developmental patterning, the fabric, soil, topography, ecology, climate, and building orientation, in the development of a project design.
9. Design sites, facilities, and systems that are responsive to relevant codes and regulations, and include the principles of life-safety and accessibility standards.
10. Demonstrate the basic principles of structural systems and their ability to withstand gravitational, seismic, and lateral forces, as well as the selection and application of the appropriate structural system.
11. Understand the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

ARCH 1220. Architecture World History I**3 Credits (2+2P)**

A survey of the development of world architecture from the ancient era to the advent of the enlightenment in Europe. Major emphasis is on the visual, intellectual, cultural and technological aspects of the ancient and indigenous cultures of the classical and pre-modern world. Community Colleges only. Restricted to Alamogordo, Dona Ana and Grants campuses.

Learning Outcomes

1. Identify major architectural monuments from prehistory to the Renaissance (1400's) in the Western world
2. Demonstrate an understanding of major monuments, styles of architecture and building traditions of non-Western cultures
3. Recognize the relationship of movements and styles in Western architecture to their counterparts in painting and sculpture from the various historical periods
4. Describe the basic principles of urban design
5. Express an appreciation of architectural achievements and the ways in which the elements of art (line, form, color, texture, light, etc.) combine to produce objects of beauty in the built environment
6. Describe basic engineering concerns and achievements in architecture

ARCH 1310. Introduction to Architecture, Engineering, & Construction**3 Credits (3)**

Introduction to and exploration of careers in the fields of architecture, engineering, and construction. Specific fields to include: architecture, civil engineering, mechanical engineering, structural engineering, engineering technology, residential construction, commercial construction, geographical information systems (GIS), surveying, sustainable design, and green building Crosslisted with: DRFT 100.

Learning Outcomes

1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes ARCT 100 Course Competencies
5. Describe different career options in architecture, engineering, and construction,
6. Define the roles of different design professionals and support staff,
7. Explain related educational and professional licensing requirements,
8. Articulate employer expectations,
9. Explore related courses and programs of study at DACC and NMSU, and
10. Develop good workplace skills and professional, productive work habits.

ARCH 2111. Architectural Delineation I**3 Credits (2+2P)**

Introduction to visual literacy, architectural graphic communication, & basic analytical skills. Architectural concepts primarily explored through the application of technical drawing, descriptive geometry, & material manipulation; primarily black & white media. Use of digital tools and media as applicable. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Develop and utilize visual observation skills
2. Translate visual observations into graphical information
3. Develop and utilize critical thinking in the development of projects
4. Develop effective line drawing techniques
5. Produce graphical representations using various shading techniques
6. Communicate design concepts and ideas clearly

ARCH 2114. Construction Documents**3 Credits (2+2P)**

Basic use of CAD to produce residential, commercial, and industrial architectural working drawings, including floor plans, sections, foundation plans and details, exterior and interior elevations, framing plans, and site plans. Use and application of building and zoning codes, typical construction methods and materials, and accessibility requirements. Basic 3-D modeling, AIA layering standards, sheet layout, and construction document coordination. Restricted to: Community Colleges only.

Prerequisite(s)/Corequisite(s): DRFT 109.

Learning Outcomes

1. Create full 3D architectural project models, both via tutorials, and independently
2. Set models up as working drawings.
3. Have a working knowledge of the tools that the majority of users will use to work with Revit Architecture.
4. Project File management skills

ARCH 2115. Architecture Design Studio II**5 Credits (1+8P)**

Advanced graphic communication, design, and 3D physical model representation. Focus on site analysis, programming and fundamental design issues of context, environment, program development and space planning, 2D and 3D design and presentation techniques. Course is 'Studio/critique-based' with considerable amount of outside work/hours required. This course is designed to be taken during student's last year in the Pre-Architecture program at DACC. Restricted to Alamogordo, Dona Ana and Grants campuses.

Prerequisite(s): Grade of C- or better in ARCH 1122.

Learning Outcomes

1. Write and speak effectively and use representational media appropriate for both within the profession and with the general public.
2. Raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards
3. Gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.
4. Effectively use basic formal, organizational and environmental principles and the capacity of each to inform two-and three-dimensional design.
5. Apply the fundamentals of both natural and formal ordering systems and the capacity of each to inform two-and three-dimensional design.
6. Examine and comprehend the fundamental principles present in relevant precedents and to make informed choices about the incorporation of such principles into architecture and urban design projects.
7. Prepare a comprehensive program for an architectural project that includes an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.
8. Respond to site characteristics, including its context and developmental patterning, the fabric, soil, topography, ecology, climate, and building orientation, in the development of a project design.
9. Design sites, facilities, and systems that are responsive to relevant codes and regulations, and include the principles of life-safety and accessibility standards. 1
10. Demonstrate the basic principles of structural systems and their ability to withstand gravitational, seismic, and lateral forces, as well as the selection and application of the appropriate structural system. 1
11. Understand the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

ARCH 2116. Architectural Delineation**3 Credits (2+2P)**

Continuation of ARCH 2111 with an emphasis in color media.

Prerequisites: ARCH 2111.

Learning Outcomes

1. Develop and utilize visual observation skills
2. Translate visual observations into graphical information
3. Develop and utilize critical thinking in the development of projects
4. Develop effective line drawing techniques
5. Produce graphical representations using various shading techniques
6. Communicate design concepts and ideas clearly

ARCH 2122. LEED Accreditation Exam Prep**3 Credits (3)**

This course is intended for anyone in the construction or architectural design fields who is interested in learning more about green building and the LEED (Leadership in Energy and Environmental Design) strategies, and are also interested in learning about how to become LEED accredited. Overview of the LEED rating systems utilized in the design and operation of buildings, the various LEED building certifications, and accreditation requirements for professionals. Highlights include interpretation of the LEED Reference Guides, accepted strategies for meeting LEED certification, sample practice exams, integrated project delivery methods, and a practical approach to problem solving through the use of design problems. Restricted to Community Colleges only.

Learning Outcomes

1. The student completing this course should gain knowledge and skills for each of the topics covered in the Course Outline.
2. Successful completion of this course should give each student a working knowledge of various LEED Rating Systems, and LEED GA Study Guides.
3. Students will develop critical thinking strategies to enable them to develop preliminary design and plan checking for code compliance.
4. Students should develop acceptable and productive work habits

ARCH 2124. Professional Development and Leadership**1-3 Credits (1-3)**

As members and/or officers of student professional organizations, architecture students gain experience through undertaking leadership roles, participating in team building, and becoming involved in service to the community. Students can also gain actual work experience involving skills related to their field of study. May be repeated up to 6 credits.

Learning Outcomes

1. Leadership skills.
2. Presentation techniques and public speaking.
3. Organizational and teambuilding skills.
4. Architecture-related skills.
5. Community organizations and service.

ARCH 2220. Architectural World History II**3 Credits (2+2P)**

A survey of the development of world architecture from the enlightenment in Europe to the present. Community Colleges only. Restricted to Alamogordo, Dona Ana and Grants campuses.

Prerequisite(s): ARCH 1220 or consent of instructor.

Learning Outcomes

1. Identify major architectural monuments from 1400 to the present in the Western world
2. Identify major architectural monuments from 1400 to the present in the Western world
3. Recognize the relationship of movements and styles in Western architecture to their counterparts in design, painting, and sculpture from the various historical periods
4. Describe the basic principles of urban design
5. Express an appreciation of architectural achievements and the ways in which the elements of art (line, form, color, texture, light, etc.) combine to produce objects of beauty in the built environment
6. Analyze basic engineering concerns and achievements in architecture

ARCH 2994. Portfolio Design in Architecture**3 Credits (3)**

This course is intended for Pre-Architecture students in their last semester of the program. Students develop a comprehensive portfolio that compiles, organizes, and showcases their most accomplished coursework produced in Architecture courses at DACC, in preparation for application to a 4 yr. Architecture program. Skills and techniques in architectural photography, scanning, and design layout using graphic software. Restricted to Community Colleges only.

Corequisite(s): ARCT 2115.

Learning Outcomes

1. Edit and enhance previous drawings, digital files, and models.
2. Research and learn about portfolio and layout styles.
3. Development/Presentation of Final Portfolio for application/transfer purposes, as well as presenting it to the class and other reviewers.
4. Document drawings, models, digital work and other productions accurately and effectively.
5. Organize their coursework and select the images that best showcase learned skills
6. Develop organizational habits to record and document their work and back up digital copies
7. Develop analytical skills to produce an effective layout to then produce a portfolio
8. Organize, layout and design their own portfolio.

ARCH 2995. Cooperative Experience**1-6 Credits**

Supervised cooperative work program. Student employed in approved occupation; supervised and evaluated by employer and instructor. Student meets weekly with instructor. Graded S/U.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

ARCH 2996. Special Topics**1-6 Credits**

Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

ARSC-ARTS & SCIENCES

ARSC 1110. Insights: University Experience for Future Careers**1 Credit (1)**

Research and investigation of college majors and career opportunities.

ARSC 1115. Success Seminar**1 Credit (1)**

Academic and personal strategies and campus resources to enhance scholastic achievement. May be repeated up to 1 credit.

ARSC 1120. Quantitative Foundations**3 Credits (3)**

Course is designed to prepare students for College level mathematics. Initial assessments generate individualized paths to mastery of fundamental skills. Course also covers strategies and campus resources to enhance scholastic achievement. Traditional Grading with RR. May be repeated up to 6 credits.

ARSC 2511. Leadership and Mentorship Training for Arts and Sciences Student Leaders**1 Credit (1)**

Leadership training for student volunteers serving in the Arts and Sciences Student Ambassador program or other student leadership roles. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to identify leadership strengths and techniques to enhance leadership capabilities
2. Students will be able to formulate strategies for goal setting and persistence
3. Students will be able to identify different student support services available on NMSU main campus and their roles.
4. Students will be able to identify the different disciplines in the Arts and Sciences and their missions, and articulate their broader roles in training students.

ARSC 2996. Interdisciplinary Topics**1-4 Credits (1-4)**

An interdisciplinary approach to subject matter cutting across departmental fields. Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

ARSC 3110. Prehealth Internship**1-3 Credits (30P)**

Placement with an office of a health professional. May be repeated up to 3 credits.

Prerequisite: Minimum junior standing, 2.5 GPA.

ARSC 3130. Faculty Led International Travel**1-3 Credits (1-3)**

This is an intensive Faculty Led International Program and earns an additional credit(s) for participation the FLIP. May be repeated up to 3 credits.

ARSC 3996. Interdisciplinary Topics**1-3 Credits (1-3)**

An interdisciplinary approach to subject matter cutting across departmental fields. Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

ARSC 4110. Career Readiness for Majors in Arts and Sciences**1 Credit (1)**

Career preparation for graduating students with majors in the College of Arts and Sciences. Students will evaluate their academic experiences as they relate to their career goals and formulate strategies to begin and build their careers.

Learning Outcomes

1. Students will evaluate their academic experiences as they relate to their career goals.
2. Students will demonstrate an understanding of how their educational experiences relate to post-graduation opportunities.
3. Students will learn to build and present a professional portfolio.

ARSC 4550. Topics in Pharmacy**12-18 Credits (12-18)**

This course accepts the transfer of credits from the University of New Mexico College of Pharmacy to New Mexico State University for students who are participants in the UNM/NMSU Cooperative Pharmacy Program. May be repeated up to 18 credits.

ARSC 4555. Advanced Topics in Pharmacy**12-18 Credits (12-18)**

This course accepts the transfer of credits from the University of New Mexico College of Pharmacy to New Mexico State University for students who are participants in the UNM/NMSU Cooperative Pharmacy Program. May be repeated up to 18 credits.

ARTH-ART HISTORY

ARTH 1115G. Orientation in Art**3 Credits (2+3P)**

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.

Learning Outcomes

1. Identify elements of art principles of design.
2. Articulate the relationship of art to the human experience.
3. Write and discuss critically using the vocabulary of art.
4. Interpret art within cultural, social, personal, and historical contexts.
5. Critically analyze an original work of art.

ARTH 2110G. History of Art I**3 Credits (3)**

This survey course explores the art and architecture of ancient pre-historic cultures through the end of the fourteenth century. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development.

Learning Outcomes

1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2120G. History of Art II**3 Credits (3)**

This survey course will explore the architecture, sculpture, ceramics, paintings, drawings, and glass objects from the 14th century to the modern era. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development. May be repeated up to 3 credits.

Learning Outcomes

1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2136. Writing in Art**3 Credits (3)**

This class looks at the variety of writings associated with art history and studio art practice. It explores the discipline of art history itself, and introduces students to the specific ways in which art historians study art. Within a workshop setting, students will practice approaches to research, understanding art and writing about art. Students will also be introduced to professional writing practices, including digital formats, relating to studio art.

Learning Outcomes

1. Develop visual literacy in looking at art 2. Analyze a complex art historical argument
2. Apply art specific vocabulary to critically-based writings and discussions of art
3. Develop writing skills to articulate the relationship of art to the human experience

ARTH 300. Special Topics in Art History**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes, individual topics may not be repeated. Restricted to Las Cruces campus only. May be repeated up to 12 credits.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.

Learning Outcomes

1. Analysis of specific problems in art history
2. Evaluate approaches to specific problems in art history

ARTH 305. Medieval Art**3 Credits (3)**

History of painting, stained glass, sculpture, architecture and manuscript illumination in Europe from the Early Christian period to the end of the Gothic period; taught with ARTH 505.

Prerequisite(s): ARTH 2110G, ARTH 2120G, and ARTS 2671 or consent of instructor.

ARTH 310. Native American Art**3 Credits (3)**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. Considers the artistic expression and the function of art in diverse cultural and environmental contexts.

Prerequisite(s): ARTH 2110G, ARTH 2120G, and ARTS 2671 or consent of instructor.

ARTH 311. Art of China I: Neolithic to Song Dynasty**3 Credits (3)**

Survey of the art of China from the neolithic period to the end of the Song dynasty. Non-majors welcome.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2670 or HIST 2250G and HIST 2251G or consent of instructor.

Learning Outcomes

1. identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices
4. identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Taoist iconography

ARTH 312. Art of China II: Song Dynasty to Today**3 Credits (3)**

Survey of art, architecture and landscape design of China from the Song Dynasty to the present day Crosslisted with: ARTH 512.

Prerequisite(s): ARTS 2671 or ARTH 2110G or HIST 2250G and HIST 2251G or consent of instructor.

ARTH 330. Modern Architecture**3 Credits (3)**

A survey of the history of Modern Architecture with focus given to major architects, monumental buildings, and building groups stressing construction techniques and style from the 18th century to the present.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 336. Race and Art**3 Credits (3)**

Traces race, representation and appropriation through a historical and cultural lens. Issues of identity up to and including contemporary visual expression are examined. Non-majors welcomed. Each topic may be taken one time.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.

Learning Outcomes

1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience

ARTH 339. History of Photography**3 Credits (3)**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. May be repeated up to 3 credits.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 342. Global Modernisms**3 Credits (3)**

Examines themes and monuments from the late 19th century to 1968, emphasizing modern and avant-garde cultural practices.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136, or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerged in the Twentieth Century
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding Twentieth Century Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the human experience.

ARTH 343. Contemporary Global Art Practices**3 Credits (3)**

Examines the myriad of contemporary art practices, media, and forms from 1968 to the present.

Prerequisite: ARTH 2120G, ARTH 2136; or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the contemporary human experience.

ARTH 344. Gender, Sexuality, and Art in the Americas**3 Credits (3)**

This course examines woman power/trans/ queer discourses of both the global south and those of people of color in the United States in relation to art from Latin, Central, and North America.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 345. Latin American Film**3 Credits (3)**

Surveys films and their histories from Latin American and the LatinX diaspora.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic

ARTH 346. Museum and Curatorial Studies**3 Credits (3)**

This museum and curatorial studies course surveys practices, objects, and histories.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 390. Visual Culture of the 1960s**3 Credits (3)**

Focus on major cultural trends and historical events in 1960's America. Offers analysis of art, films, and pop culture phenomena of the period.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 444. Art and Life in Renaissance Italy**3 Credits (3)**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself. 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, titian, humanism, the Medici, and republican and courtly culture.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 477. Independent Research in Art History**1-9 Credits (1-9)**

Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required.

Learning Outcomes

1. Student will analyze approaches to a problem in art history
2. Student will evaluate approaches to a problem in art history
3. Student will formulate approaches to address a problem in art history

ARTH 478. Seminar in Art History**3 Credits (3)**

Reading, research, and discussion of advanced problems. Topics will be announced in the course schedule. Each topic may be only taken once. Non-art/art history majors, contact instructor for consent.

Prerequisite: ARTH 2110G, ARTH 2120G and ARTH 2136, and one 300 level ARTH course or consent of instructor.

Learning Outcomes

1. Analyze problems in art history
2. Propose a hypothesis relating to a problem in art history and support conclusions through research
3. Evaluate various approaches to problems in art history

ARTH 479. Methodologies and Theories of Art and Art History**3 Credits (3)**

Theories and methodologies in art, art history and art criticism; taught with ARTH 579

Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136 and one 300 level art history course or consent of instructor.

Learning Outcomes

1. understand the history of the discipline of art history, its origins, and its institutional developments
2. Assess the strengths and limitations of various approaches and methods to interpreting works of art
3. identify the methodology employed in an art historical argument
4. apply a variety of methodological and critical approaches to interpreting a work of art and assess the strengths and limitations of those applications
5. recognize strategies of art practice that correspond to different methodological and critical approaches

ARTH 500. Special Topics in Art History**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. Individual topics may only be taken one time. Students must be Graduate students to enroll.

Learning Outcomes

1. Analyze specific problems in Art History
2. Evaluate approaches to specific problems in Art History

ARTH 510. Advanced Native American Art**3 Credits (3)**

Cross-cultural introduction to art of the prehistoric and historic native people of the North, Central, and South Americas. The artistic expression and the function of art considered in diverse cultural and environmental contexts. Crosslisted with: ARTH 310.

Prerequisite(s): Graduate standing.

ARTH 511. Art of China I: Neolithic to Song Dynasty**3 Credits (3)**

Survey of the art of China from the neolithic period to the Song dynasty. Student must be a Graduate student to enroll.

Learning Outcomes

1. Identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. Describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices.
4. Identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Daoist iconography

ARTH 536. Race and Art**3 Credits (3)**

This course explores the visual expression of race and identity in art and visual culture from a diverse geographical and historical range. Each topic may only be taken one time. Crosslisted with: ARTH 336. Students must be Graduate students to enroll.

Learning Outcomes

1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. Identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience.
5. Formulate a question concerning race and art and using analysis, evaluate the research on that question and create an original argument.

ARTH 539. History of Photography**3 Credits (3)**

Course studies history, theory and use of photographic practices in art, especially from formal introduction of the process in 1839 to the present. Crosslisted with: ARTH 339.

Prerequisite(s): Graduate standing.

ARTH 542. Global Modernisms**3 Credits (3)**

Examines themes and monuments of created from the end of the 19th century to 1968 emphasizing modern and avant-garde cultural practices. Crosslisted with: ARTH 342. Students must be Graduate students to enroll.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles that emerged in the early Twentieth Century to 1968
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding the art of this period
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in art history relating to the topic of the course, evaluate and assess research, and create an original argument concerning that problem

ARTH 543. Contemporary Global Art Practices**3 Credits (3)**

Examines the myriad of contemporary art practices, media, and forms from 1968 to the present. Crosslisted with: ARTH 343. Students must be in Graduate standing to enroll.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in contemporary art, evaluate and assess research, and create an original argument concerning that problem

ARTH 544. Gender, Sexuality, and Art in the Americas**3 Credits (3)**

This course examines woman power/trans/ queer discourses of both the global south and people of color in the United States in relation to art from Latin, Central, and North America. Cross-listed with ARTH 344. Students must be in graduate standing to enroll.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 545. Latin American Film**3 Credits (3)**

Surveys films and their histories from Latin American and the LatinX diaspora. Taught with ARTH 345. Students must be in graduate standing to enroll.

Learning Outcomes

1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic works

ARTH 546. Museum and Curatorial Studies**3 Credits (3)**

This museum and curatorial studies course surveys practices, objects, and histories. Taught with ARTH 346. Students must be in graduate standing to enroll.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 578. Seminar in Art History**3 Credits (3)**

Reading, research, and discussion of advanced problems in art history; rotating topics will be announced in the course schedule. Individual topics may only be taken once. Student must be Graduate students to enroll.

Learning Outcomes

1. Analyze advanced problems in art history
2. Evaluate approaches to advanced problems in art history

ARTH 579. Graduate Seminar: Art Theory, Criticism, Historiography**3 Credits (3)**

Theories and methodologies in art history and art criticism.

Prerequisite: graduate standing.

ARTH 597. Independent Study in Art History**3 Credits (3)**

Supervised independent study in topics in art history. Students must be in graduate standing to enroll.

Learning Outcomes

1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

ARTH 599. Art History Thesis**1-15 Credits (1-15)**

Art history master's thesis research. Students must be in Graduate standing to enroll.

Learning Outcomes

1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

ARTS-ART STUDIO

ARTS 1121. Foundations in Art

3 Credits (2+4P)

The Foundations course will focus on a deceptively simple question. "What is Contemporary Art, and how can we make it?" Through the exploration of basic visual design concepts, collaborative learning, and interdisciplinary studio production, this course will help us to discover what it means to be an artist in the 21st century.

Learning Outcomes

1. Create original works of art through the investigation of ideas and concepts resulting in the communication of meaning. Develop forms that convey meaning.
2. Evaluate works of art through critiques that appraise how the form communicates meaning. Justify the decisions that were made in the use and application of the chosen medium and form to communicate meaning in a work of art.
3. Analyze the differences in clarity of communication between works of art based subject matter, medium and form.
4. Apply knowledge provided in lectures to produce works of art that communicate meaning. Demonstrate an ability to express concepts in visual form.
5. Understand how the choice of subject matter, medium and form translate in the expression of concepts through discussion and description.
6. Remember the fundamental tenets of art, elements and principles of design, through the duplication of them in works of art as well their use in discussions.

ARTS 1145G. Visual Concepts

3 Credits (2+4P)

Visual Concepts is an introduction to the philosophies of art, visual thinking, and principles of visual organization. Designed to give students a broad view of aesthetic traditions, ideologies, and techniques basic to the creation and evaluation of art. Principles and concepts are taught in a common lecture and applied in parallel small studio sections. For non-art majors only.

Learning Outcomes

1. Develop understanding of history, major styles and contemporary issues in art.
2. Introduce students to the language of visual perception and aesthetic evaluation.
3. Introduce students to the fundamental processes of visual perception and artistic expression.
4. Develop students' confidence in using various art materials for artistic expression.
5. Develop students' ability to verbalize ideas and processes in art making.
6. Develop student's ability to communicate through writing about art and art experiences.

ARTS 1240. Design I

3 Credits (3)

This course introduces the fundamentals of two-dimensional design as it applies to fine art and commercial contexts. Emphasis will be on basic color theory, elements of dynamic composition, vocabulary of visual arts and design, and development of visual conceptual skills. Students will use a variety of materials and techniques. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Produce art works that apply and organize the elements of two-dimensional form (line, shape, value, texture, color and space).
2. Produce artworks that apply the principles of two-dimensional design (harmony, variety, repetition, balance, rhythm, proportion, dominance, movement, and economy).
3. Demonstrate effective use of materials and techniques with consideration for craftsmanship and presentation.
4. Use visual art vocabulary in the development and critique of work
5. Explore concepts and ideas: from conceptual, realistic/referential to non-representational

ARTS 1250. Design II

3 Credits (3)

This course introduces the basic formal (aesthetic), spatial, and physical aspects of 3-D form as they can be applied to sculptural and functional design. Techniques that explore structure, mass, volume, scale, surface, form, and function are covered, along with various media, which may include paper, wood, clay, and/or metal. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Apply the artistic qualities of the elements of art and principles of design to three-dimensional form.
2. Create 3 dimensional form using varied sculptural methods, construction techniques and media.
3. Produce 3 D design projects safely with proper use of equipment and materials.
4. Apply realistic, referential, and abstract concepts and ideas to projects.
5. Demonstrate knowledge of 3-D related art vocabulary, origin and trends in sculpture, and 3-D design fundamentals.

ARTS 1310. Introduction to Ceramics

3 Credits (2+4P)

This course introduces the technical processes and conceptual concerns of working with ceramic material. Various methods of forming functional and expressive works out of clay are explored. Methods used include handbuilding and throwing, basic clay bodies, slip and glaze, and atmospheric firing.

Learning Outcomes

1. Explain the transformation of the ceramic material from raw clay form to glazed ceramic object
2. Demonstrate proficiency of technical ceramic skills
3. Explain larger concepts and design principles
4. Apply basic 3-D design principles in the formation of a work of art, as they apply to the ceramic media
5. Create ceramic works of art based on conceptual prompts
6. Critically evaluate a variety of artwork
7. Gain an understanding of the history of ceramic art from a multicultural perspective

ARTS 1320. Ceramics I**3 Credits (2+4P)**

An introduction to the medium of clay incorporating hand building and wheel throwing to introduce the student to both the sculptural and utilitarian uses of clay. The student will also be introduced to a variety of glazing and firing techniques

Learning Outcomes

1. Demonstrate through critical discourse or writing an introductory knowledge of the history of ceramics, and ceramic language and terminology.
2. Demonstrate through mechanical application an introductory knowledge of the properties of clays, glazes, and a variety firing techniques.
3. Produce a body of work that exemplifies good ceramic design through the effective use of form, surface, and color.
4. Through the production a body of work demonstrate competency in hand building and throwing on the wheel.

ARTS 1410. Introduction to Photography**3 Credits (2+4P)**

This course introduces the making of photographic images from a broad viewpoint to consider both as an art practice and as a cultural practice. The course covers technical information on camera use and functionality, composition and visual design, digital workflow and editing, professional functions of manipulating and enhancing images, and printing correctly and effectively. The historical aspects of photography are also covered. May be repeated up to 3 credits.

Learning Outcomes

1. Gain fluency with basic camera function as well as a working knowledge of other photographic equipment and software to produce technically competent photographs
2. Have a familiarity with current image-editing software to enhance images as well as developing a digital workflow for the management of digital images
3. Be able to develop creative solutions to visual photographic problems
4. Gain awareness of contemporary issues in contemporary art photographic practice that can be applied to the one's own individual practice
5. Develop the ability to critically analyze and discuss photographic images
6. Print and produce a final project that demonstrates synthesis of ideas presented in the course readings, critiques, and individual research
7. Demonstrate photographic terminology, and the many ways photographs function in society, both currently and historically

ARTS 1520. Digital Media I**3 Credits (2+4P)**

This course provides an introduction to two of Adobe's major software applications, Illustrator and Photoshop, which are essential in creating artwork, designing promotional materials, websites and more. Part of the course deals with creating a variety of documents using the major tools of each program, and gaining an understanding of the contemporary graphic design industry and basic elements and principles of design. Community Colleges only.

Learning Outcomes

1. Demonstrate appropriate skills in configuring and navigating computer systems software applications as appropriate to digital image making needs including organization of files using keywords and running batch processes.
2. Exhibit an understanding of a layer based bitmap editing program, through photo retouching, precise use of selection tools, and color adjustment techniques.
3. Create imagery using a vector based illustration program which demonstrates an understanding of vector based drawing tools.
4. Integrate the use of bitmap and vector images using bitmap and vector based image making applications to demonstrate a basic understanding of composition, color, and appropriate image size and resolution.

ARTS 1610. Drawing I**3 Credits (2+4P)**

This course introduces the basic principles, materials, and skills of observational drawing. Emphasis is placed on rendering a 3-D subject on a 2-D surface with visual accuracy. Other topics include historical and contemporary references as well as an investigation of linear perspective, line, value, shape, space & composition. May be repeated up to 3 credits.

Learning Outcomes

1. Produce drawings that demonstrate techniques and mechanics of observational drawing.
2. Demonstrate competency in the following practices: measuring and sighting, gesture, contour line, negative space, shape, value, space, volume, plane and texture.
3. Create drawings primarily from observation with black and white traditional drawing media.
4. Demonstrate effective verbal or written response to one's own art and the art of others.

ARTS 1630. Painting I**3 Credits (2+4P)**

This course introduces the tradition of painting as a medium for artistic expression. Students will investigate materials, tools, techniques, history and concepts of painting. Emphasis is placed on developing descriptive and perceptual skills, color theory, and composition. May be repeated up to 3 credits.

Prerequisite(s): ARTS 1610.

Learning Outcomes

1. Produce paintings that demonstrate the tradition of methods, techniques, materials, and tools of oil painting.
2. Construct a variety of support structures and grounds on which paintings are created
3. Examine the historical origins and practices of painting from the personal, social and cultural perspective.
4. Identify and apply environmentally safe painting practices, care of tools, equipment, and facilities, as well as disposal of mediums, solvents and paints.
5. Apply basic color theory to representational and non-representational painting.

ARTS 1710. Introduction to Printmaking**3 Credits (2+4P)**

This course provides direct experience of exploring basic printmaking processes, including relief, intaglio, and monoprint processes, as well as the investigation of materials/media, tools, techniques, history, and concepts of printmaking. Emphasis is given to solving problems through thematic development while producing a portfolio of prints.

Learning Outcomes

1. Properly operate a printing press and safely handle materials and equipment.
2. Demonstrate an adequate ability to utilize basic historical printmaking techniques that are widely relevant to contemporary, artistic expressions.
3. Utilize formal elements of art and design (line, shape, value, texture, space, and color), to create prints that are formally sophisticated.
4. Create imagery that contains conceptual depth, which can be interpreted by viewers with regard to social, cultural, political, geographical, and/or psychological experiences and relevance.

ARTS 1711. Computer-Based Illustration**3 Credits (2+4P)**

Introduction to the principles of computerized drawing and design. Using the basic concepts, drawing tools, and vocabulary of Adobe Illustrator.

Prerequisite: ARTS 1610, ARTS 1240, or consent of instructor.

Learning Outcomes

1. Demonstrate drawing with the pen tool.
2. Demonstrate the use of blending color and creating shapes.
3. Create spot colors and effectively use them in a page layout.
4. Demonstrate formatting and creating typography.
5. Demonstrate the use of layers, effects, graphic styles, symbols, and brushes
6. Demonstrate competency in creating digital graphics using of Adobe Illustrator software

ARTS 1712. Digital Graphics**3 Credits (2+4P)**

Importing and exporting images and text into various desktop publishing formats. Exploring imaging, drawing, and page layout applications. Introduction to typography.

Prerequisite: ARTS 1520.

Learning Outcomes

1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 1713. Web Page Design**3 Credits (2+4P)**

Introduction to the creation of well-designed and organized Web sites. Emphasis on building creative but functional user-friendly sites. Introduction to HTML, Flash, Java Script, and Web-authoring software. Community Colleges only.

Prerequisite: ARTS 1520.

Learning Outcomes

1. Outline the structure and functionality of a typical website.
2. Demonstrate design and layout skills.
3. Demonstrate competency in the use of Dreamweaver software.
4. Demonstrate competency in the use of photo editing software.
5. Demonstrate skills learned for website functionality.
6. Create an Internet compatible website.

ARTS 1810. Jewelry and Small Metal Construction I**3 Credits (2+4P)**

This course introduces the basic techniques, materials, and tools traditionally used in the creation of jewelry and/or small-scale sculptural objects.

Learning Outcomes

1. Apply basic jewelry fabrication techniques (such as: piercing, cold connections, soldering, metal forming, casting and stone setting) to complete projects.
2. Create design sketches of the objects prior to fabrication.
3. Demonstrate knowledge of materials and safe practices for making jewelry, as well as small functional and non-traditional objects.
4. Analyze projects through critiques, oral presentations, and discussions.

ARTS 2010. Portfolio Development**3 Credits (2+4P)**

This course presents the practicalities of building an art career with emphasis on developing a professional portfolio through visual aids, resumes, statements, and presentations. It covers professional practices of the studio artist including self-promotion, contracts, research tools for exhibition venues and other art related opportunities.

Prerequisites: ARTS 1712, ARTS 2611, and ARTS 1520, or consent of instructor.

Learning Outcomes

1. Develop a portfolio package with visual aids, photographic documentation, resumes, bios and artist statements.
2. Analyze the qualifications, procedures and portfolio requirements necessary for professional art related opportunities.
3. Complete an oral presentation on a series of personal works.
4. Distinguish pathways for navigating the business side of being a professional artist.

ARTS 2355. Stained Glass**3 Credits (2+4P)**

Instruction in the fundamental fabrication and design techniques for stained glass. Introduction to visual decision making skills, historical, and critical issues of the medium. Community Colleges only.

Learning Outcomes

1. Demonstrate an understanding of the theory, principles and procedures that comprise the art and science of designing at least four (40 stained glass techniques through both written and verbal assessments, as well as, actual completed examples of each technique.
2. Properly select and safely employ various glass studio tools, instruments, procedures, methods and techniques in the fabrication processes of stained glass.
3. Select and apply suitable problem-solving strategies in a practical studio environment.
4. Work cooperatively in a studio classroom.
5. Relate historical background and significant developments of glass in general and stained glass in particular.
6. Understand the chemical processes associated with various processes used in working with and manipulating glass.
7. Develop critical thinking and problem solving strategies in various stained glass fabrication technics.
8. Be able to critically analyze, assess and appreciate the value of glass works of every kind.

ARTS 2410. Black & White Photography**3 Credits (2+2P)**

This course introduces the fundamental techniques of black and white photography, which includes camera functions and use, exposure techniques and film processing, traditional darkroom printing, and presentation of work. Same as ARTS 1410.

Learning Outcomes

1. Demonstrate competent film development and photographic printing skills
2. Demonstrate an emerging understanding of aesthetic, compositional, conceptual, and communicative tools in photography including lighting and dynamic composition techniques.
3. Be able to critically analyze and discuss photographic images using photographic terminology
4. Demonstrate proper image adjustment and correction techniques, and apply proper exposure techniques

ARTS 2430. Photographic Portraiture**3 Credits (2+2P)**

This course covers the study of professional photography that involves people, including studio and environmental portraits. Topics include studio and exterior lighting techniques, and selecting lighting equipment and supplies. Restricted to: Community Colleges only.

Prerequisite(s): ARTS 1410 or FDMA 1545.

Learning Outcomes

1. Demonstrate successful operation of studio lighting equipment and accurately define lighting equipment terminology
2. Illustrate the principles of photographic lighting
3. Demonstrate and apply how to use and modify natural light effectively
4. Demonstrate understanding of different approaches such as formal, informal, candid, vernacular and their cultural implications
5. Distinguish historic and contemporary cultural notions informing different types of portraits

ARTS 2431. Introduction to Graphic Design**3 Credits (2+4P)**

Introduction to the principles of visual communication and digital media, letterforms, typography and identity marks. Projects produced using conventional and digital tools.

Learning Outcomes

1. Demonstrate working knowledge of the graphic design software.
2. Identify and apply basic design concepts for the purpose of visual communication.
3. Conduct visual research and create presentations on design topics.
4. Solve graphic design problems through solving fundamental communication challenges by sketching, drawing, typographic composition, use of image and color.

ARTS 2440. Photo Finishing & Presentation**2 Credits (1+2P)**

Use of visual language for personal expression. Freelance photography; care of original photos; preparation of portfolios, photographic markets, exhibitions and judging, galleries and copyrights. Students will prepare a photographic portfolio. Restricted to: Community Colleges only.

Prerequisite(s): FDMA 1545.

Learning Outcomes

1. Define your target market and create a complete "Personal Promotional Package"
2. Produce a professional Resume Cover Letter.
3. Produce a professional looking Business Card, Letterhead Mailing Labels
4. Produce a single page Promotional Piece, (and possible follow-up material)
5. Produce a PDF Formatted Portfolio (Create in Photoshop Export as PDF)
6. Produce a clean, professional looking traditional hard portfolio with 20-30 pieces
7. Present the Entire Promotional Portfolio and promo materials in a "Job Interview"

ARTS 2610. Drawing II**3 Credits (2+4P)**

This course introduces color and colored media as an element of composition while emphasizing descriptive and perceptual drawing skills and conceptual approaches to contemporary drawing. Restricted to ART and ANVE/DFM majors.

Prerequisite(s): ARTS 1610.

Learning Outcomes

1. Create drawings in wet and dry color media.
2. Practice analyzing and visually translating observed subjects from realistic, referential, and/or objective form, to non-representational or abstract imagery in drawings.
3. Compose fully developed drawings that include a conceptual or historical basis.
4. Engage in effective written and oral critique in response to one's own art and the art of others.

ARTS 2611. Advanced Computer-Base Illustration**3 Credits (2+4P)**

Design custom graphics and create special effects with filtering, special effects on type, graphing, technical illustrations, and three-dimensional drawing using Adobe Illustrator.

Prerequisites: ARTS 1212, ARTS 1711, and ARTS 1520, or consent of instructor.

Learning Outcomes

1. Demonstrate competency in the use of Adobe Illustrator software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 2616. Aspects of Drawing**2-3 Credits**

Continued work in drawing with emphasis on personal creative endeavor. Community Colleges only.

Prerequisites: ARTS 1610 and ARTS 2610.

Learning Outcomes

1. Advanced skill level in the visual dynamics of line involved in the creation of drawing.
2. Advanced skill level in the visual dynamics of shape involved in the creation of drawing.
3. Advanced skill level in the visual dynamics of value involved in the creation of drawing.
4. Advanced skill level in the visual dynamics of color involved in the creation of drawing.
5. Advanced skill level in the visual dynamics in the combination of line, shape, value and color involved in the creation of drawing.

ARTS 2630. Painting II**3 Credits (2+4P)**

This course focuses on the expressive and conceptual aspects of painting, building on the observational, compositional, technical, and critical skills gained previously. Students will investigate a variety of approaches to subject matter, materials, and creative processes through in-class projects, related out-of-class assignments, library research or museum/gallery attendance, written responses, and critiques.

Prerequisite(s): ARTS 1610 and ARTS 1630

Learning Outcomes

1. Produce paintings building on the skills and techniques learned in Painting I
2. Solve unique format, support, ground, over and under texturing surface challenges
3. Practice analyzing and translating observed subjects from realistic, referential, and/or objective form, to non-representational imagery
4. Create paintings that explore personal content, stylization, symbolism, narrative, and/or iconography

ARTS 2635. Painting III**2-3 Credits**

Continuation of ARTS 2630.

Prerequisites: ARTS 1610, ART 1240 (for art majors), ART 1630, or consent of instructor.

Learning Outcomes

1. Color mixing and color relationships
2. Create illusions of space and volume
3. The student will strengthen his or her own personal artistic style.
4. Knowledge of the proper use and maintenance of painting tools
5. Explore and learn the technique of a master painter of the past.
6. Awareness of nature, "eye hand response," and an imaginative or personal use of the medium.
7. Awareness of the creative process, exploring unforeseen possibilities
8. An ability to work independently.
9. Understanding of painting styles and arts vocabulary

ARTS 2839. Introduction to Sculpture**3 Credits (2+4P)**

Beginning sculpture students "explore space" while learning new processes and skills, including mold making, welding and woodworking.

Learning Outcomes

1. Be able to utilize a variety of traditional materials and sculpture processes, including: mold making, metal fabrication/wood fabrication, and the creative integration of mixed media.
2. You will learn to differentiate between objects and installations, and be prepared to explore sculpture in upper division, topics based courses.

ARTS 2993. Art Workshop**0.5 Credits (.5)**

Required for all freshman and sophomore Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 308. Restricted to: BA Studio Art, BA Art History BFA Studio Art, BFA Museum Conservation majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Varies

ARTS 2996. Special Topics in Studio**1-3 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

ARTS 308. Art Workshop**0.5 Credits (.5)**

Required for all junior and senior Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 208. Restricted to: BA studio art, BA Art History BFA studio art, BFA Museum Conservation majors.

ARTS 340. Internship in Art**1-9 Credits (3P)**

This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 350. Special Topics in Intermediate Drawing and Painting**3 Credits (2+4P)**

Intermediate drawing and painting course focusing on the following topics: Realism, Color, Narrative, and Abstraction. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

Prerequisite(s): ARTS 1610 and ARTS 1630, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to drawing and painting.

ARTS 355. Special Topics in Intermediate Graphic Design**3 Credits (2+4P)**

Intermediate graphic design course focusing on the following topics: web design, typography, motion graphics, publication design. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

Prerequisite(s): ARTS 2431 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 360. The Figure**3 Credits (2+4P)**

Introduction to working from live models, anatomical skeletons, source images and the imagination in a variety of two-dimensional media, including painting and drawing. An emphasis is placed on anatomical accuracy and with a focus on the figure as an expressive subject. May be repeated up to 6 credits.

Prerequisite(s): ARTS 1610 or consent of instructor.

ARTS 365. Intermediate Sculpture Special Topics**3 Credits (2+4P)**

Intermediate sculpture students will expand their fabrication skills in metal, wood and mixed media. Assignments incorporate topics such as Pop art, Process Art, and The Body in Contemporary Art. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 6 credits.

Prerequisite(s): ARTS 2839 or consent of instructor.

ARTS 370. Special Topics in Intermediate Digital Photography
3 Credits (2+4P)

Intermediate digital photography course addressing techniques and production of photo media within the context of contemporary art. Course focuses on the following rotating special topics: Networks, Photo-book and Video art. May be repeated up to 12 credits.

Prerequisite(s): ARTS 1410, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.

ARTS 373. Intermediate Analog Photography
3 Credits (2+4P)

Introduction to skills and techniques of black and white film photography within the context of contemporary art. Emphasis on analog camera work and darkroom procedures. 35 mm SLR or rangefinder film camera required for course. May be repeated up to 6 credits.

Prerequisite(s): ARTS 1410, or consent of instructor.

ARTS 374. Intermediate Ceramics Multiples (Design and Production)
3 Credits (2+4P)

Intermediate ceramics course focusing on an introduction to the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. May be repeated up to 3 credits.

Prerequisite(s): ARTS 1310 or consent of instructor.

Learning Outcomes

1. Develop the basic visual and tactile problem solving skills necessary to making one part and two part molds.
2. Demonstrate competency is using these techniques to translate basic cylindrical, spherical, and rectangular forms.
3. Develop ability to make successful clay casts from properly made molds.
4. Apply the principles of design to creating multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Apply the visual element to glazing and surface design of ceramic forms: Line, Shape, Mass, Value, Color, Texture, Pattern, Space
7. Through research, writing, and class critiques develop the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art.

ARTS 375. Intermediate Ceramics Sculptural Concerns
3 Credits (2+4P)

Intermediate ceramics course focusing on the refinement of technical skills with an emphasis on conceptual development related to materiality.

Prerequisite(s): ARTS 1310 or consent of instructor.

Learning Outcomes

1. Refine and master the basic skills in all the standard ceramic building techniques. This includes wheel throwing, coil building, and slab building.
2. Demonstrate competency is using these techniques to replicate complex geometric, organic, and figurative forms
3. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural forms.
4. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural form.
5. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
6. Demonstrate clear understanding of the visual element to glazing and surface design: Line, Shape, Mass, Value, Color, Texture, Pattern, Space
7. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent and nuanced way.

ARTS 376. Museum/Gallery Research Internship
1-9 Credits

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTS 385. Special Topics in Intermediate Metals/Jewelry
3 Credits (2+4P)

Intermediate Metals/Jewelry course focusing on the following topics: design and production, materiality and sculptural concern. Techniques may include casting, complex construction, forming, and mix media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.

Prerequisite(s): ARTS 1810 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level metals/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metals/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.

ARTS 394. Special Topics in Studio
3 Credits (3)

Specific subjects and credits to be announced in the Schedule of Classes online. Topics cannot be repeated. May be repeated up to 9 credits.

ARTS 401. Museum Conservation Techniques I**3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process.

Learning Outcomes

1. Identify and explain strengths and weaknesses of the theory of conservation
2. Analyze a ceramic object through testing and observation; evaluate the results of an object to be conserved.
3. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
4. Apply conservation and restoration techniques to the ceramic object in the lab, after analyzing, evaluating and creating a treatment plan for the object.
5. Create a Condition Report of the ceramic object by describing the condition and its treatment during the conservation process.

ARTS 402. Museum Conservation Techniques II**3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation.

Prerequisite(s): ARTS 401.

Learning Outcomes

1. Analyze different types of materials by examining two objects, a painted canvas and a painted wood panel, through testing and observation and evaluate the results of the objects to be conserved
2. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
3. Apply conservation and restoration techniques to both objects in the lab, a painted canvas and a painted wood panel, after analyzing, evaluating and creating a treatment plan for the object.
4. Create a Condition Report for each object, describing the condition of the object, history, the problems the object presents, its treatment during the conservation process, and any remaining issues after treatment.

ARTS 403. Preventative Conservation/Collections Care**3 Credits (3)**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation.

Learning Outcomes

1. Understand the principles of Preventive Conservation and Collections Care and develop conservation skills through recognizing, describing, explaining, locating, and reporting symptoms and causes of the agents of deterioration that affect all types of art objects
2. Apply methods of Preventive Conservation and collections care for causes of deterioration in museum collections
3. Analyze and Evaluate several museums and create a Museum Assessment that could serve a plan of action to remediate any problems encountered.
4. Create a plan for re-organizing a museum based on the Museum Assessment
5. Create a binder based on the readings from class that includes all the causes of deterioration of materials, how to prevent deterioration, and environmental control of collections.

ARTS 404. Applied Projects in Museum Conservation**3 Credits (3)**

This course provides student with the practical application of techniques and policies learned in previous museum conservation coursework with the underpinnings of basic museum and conservation practices, particularly in collection care, preventive conservation, conservation, ethics, teamwork and security. Rotating special projects. May be repeated up to 6 credits.

Prerequisite(s): ARTS 401, ARTS 402, ARTS 403 or ARTS 501, ARTS 502, ARTS 503.

Learning Outcomes

1. Analyze and examine the different types of materials that compose one or various objects through testing and observation and evaluate the results of the object/s to be conserved
2. Create and defend the conservation treatment plan based on conservation theory and the principles of conservation for cultural objects, the tests results, and the observations.
3. Apply conservation and restoration techniques to the object/s in the lab after analyzing, evaluating and creating a treatment plan for the object/s.
4. Create Condition Reports, one for each object, by describing the condition of the object and its treatment during the conservation process.

ARTS 440. Internship in Art**1-9 Credits (3P)**

This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 450. Special Topics In Advanced Drawing and Painting**3-6 Credits (2-4+4P)**

Advanced drawing and painting course focusing on the following topics: Identity, Place, Spirituality, and Body. Topics will be announced in the course schedule. May be repeated up to 12 credits.

Prerequisite(s): 6 credits of ARTS 350, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting

ARTS 455. Special Topics in Advanced Graphic Design**3 Credits (2+4P)**

Advanced graphic design course focusing on the following special topics: special projects, identity design, storytelling, portfolio. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 15 credits.

Prerequisite(s): 6 credits of ARTS 355, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 465. Advanced Sculpture Special Topics**3-6 Credits (2-4+4P)**

Thematic classes deepen students' knowledge of contemporary sculpture and extended media through a series of interpretive assignments that culminates in a unified body of work. Course topics include: "Artists' Maps", Installation Art/Land Art", "Sculpture and the 1960s", "Sculpture and the 1970's". Topics will be announced in the course schedule. May be repeated up to 18 credits.

Prerequisite(s): ARTS 365 or permission of the instructor.

ARTS 470. Advanced Digital Photography**3 Credits (2+4P)**

Advanced digital photography course addressing technique and production of photo media within the context of contemporary art. Course focuses on the following rotating topics: Temporality, Photo-installation and Video Art. Each topic may only be taken once.

Prerequisite: ARTS 370 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced digital photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in digital photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography

ARTS 474. Advanced Ceramics Design and Production**3-6 Credits (3-6)**

Advanced ceramics course focusing on the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. Discussions may also include issues of professional practice, marketing, and branding. May be repeated up to 6 credits.

Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.

Learning Outcomes

1. Refine the basic visual and tactile problem solving skills necessary to making two part molds, and develop the ability to make complex multipart molds.
2. Demonstrate competency is using these techniques to translate complex geometric and organic forms
3. Develop pertinent conceptual reasoning for creating multiples of a form in ceramic material.
4. Demonstrate clear understanding of the principles of design in designing ceramic multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Demonstrate clear understanding of the visual element of art to the glaze and surface design of ceramic multiples: Line, Shape, Mass, Value, Color, Texture, Pattern, Space,
7. Through research, writing, and class critiques refine the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art and articulate.

ARTS 475. Advanced Ceramics Sculptural Concerns**3-6 Credits (2-4+4P)**

Advanced ceramics course focusing on conceptual development as it relates the creation of a unified body of work. Topics may include discussions of advanced techniques, professional practices, and contemporary issues in ceramics. May be repeated up to 15 credits.

Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.

Learning Outcomes

1. Strive to innovate the standard ceramic building techniques in a way that contributes to, and is informed by, the field of ceramic sculpture.
2. Develop a cohesive body of work, which explores completely original concepts and themes.
3. Demonstrate clear understand of the principles of design by challenging them in an informed way.
4. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
5. Demonstrate clear understanding of the visual element of art by challenging them in an informed way.
6. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent, nuanced, and critical way. Begin to measure one's work against the larger context of contemporary art.

ARTS 485. Special Topics in Advanced Metals/Jewelry**3-6 Credits (2-4+4P)**

Advanced Metals/Jewelry course focusing on the following topics: conceptual development and personal aesthetic and style, professional practices, contemporary issues in Metals/Jewelry, and senior exhibition. Techniques may include enameling, coloring, historical processes, and digital technology. Topics will be announced in the course schedule. Each topic may only be taken once.

Prerequisite: 6 credits of ARTS 385, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level metal/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metal/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.

ARTS 490. Museum Conservation Internship**1-6 Credits (1-6)**

The goal of this internship is to provide a student with a practical learning experience in preventative conservation techniques and policies so that they can relate what they have learned in the classroom from ART 403 Preventative Conservation/Collections Care to applied situations. It will provide the student an opportunity to learn skills and knowledge needing in working with museum collections. Tasks and projects will be assigned by the instructor. 3 credits required for BFA in Museum Conservation. May be repeated up to 6 credits.

Prerequisite(s): ARTS 403.

ARTS 494. Special Topics in Studio**3 Credits (3)**

Specific subjects and credits to be announced in the Schedule of Classes online. May be repeated up to 9 credits.

ARTS 495. Undergraduate Studio Thesis**3-6 Credits (3-6)**

Special research and independent study leading to undergraduate thesis exhibition. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

ARTS 496. Fundamentals of Studio Management**1 Credit (1)**

Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.

Prerequisite: consent of instructor.

ARTS 499. Problems in Studio Art**1-6 Credits (1-6)**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 9 credits. Consent of Instructor required.

ARTS 501. Museum Conservation Techniques I**3 Credits (2+3P)**

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. May be repeated up to 3 credits. Crosslisted with: ARTS 401.

ARTS 502. Museum Conservation Techniques II**3 Credits (2+3P)**

Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ARTS 402.

Prerequisite(s): ARTS 501.

ARTS 503. Preventive Conservation/Collections Care**3 Credits (3)**

Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ARTS 403.

ARTS 504. Applied Projects in Museum Conservation**3 Credits (3)**

This course provides students with the practical application of techniques and policies learned in previous conservation coursework with the underpinnings of basic museum and conservations practices, particularly in collection care, preventative conservation, conservation, ethics, teamwork and security. May be repeated up to 6 credits.

Crosslisted with: ARTS 404.

Prerequisite(s): ARTS 401, ARTS 402, ARTS 403 OR ARTS 501, ARTS 502, ARTS 503.

ARTS 540. Internship in Art**1-9 Credits (3P)**

This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits. Crosslisted with: ARTS 440 and ARTS 340.

ARTS 550. Drawing and Painting Workshop**3-6 Credits (2-4+4P)**

Graduate level drawing and painting course focusing on the development of concepts, expression and visual form. May be repeated up to 27 credits.

Prerequisite(s): Graduate standing.

ARTS 555. Graphic Design**3 Credits (3)**

May be repeated up to 27 credits.

ARTS 565. Sculpture Media**3-9 Credits**

May be repeated up to 27 credits.

ARTS 570. Photography Seminar**3-9 Credits (3-9)**

Graduate students develop and implement a research program using photographic media and processes. Outcomes and program developed in consultation with photography faculty.

Prerequisite: .

Learning Outcomes

1. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography at the graduate level.

ARTS 575. Ceramic Arts**3-9 Credits**

May be repeated up to 27 credits.

ARTS 576. Museum/Gallery Research Internship**1-9 Credits**

Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. May be repeated for a maximum of 9 credits.

Prerequisite: graduate standing.

ARTS 585. Metals and Jewelry Design**3-9 Credits**

May be repeated up to 27 credits.

ARTS 595. Problems in Studio**1-6 Credits**

Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 12 credits. Consent of Instructor required.

ARTS 596. Graduate Studio Seminar**3 Credits (3)**

Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form. May be repeated for a maximum of 18 credits. Restricted to majors.

Prerequisite(s): Graduate standing.

ARTS 598. Studio Thesis**1-15 Credits**

Special research in studio, leading to an exhibition and written thesis statement.

ASTR-ASTRONOMY

ASTR 1115G. Introduction to Astronomy Lecture & Laboratory 4 Credits (3+2P)

This course surveys observations, theories, and methods of modern astronomy. The course is predominantly for non-science majors, aiming to provide a conceptual understanding of the universe and the basic physics that governs it. Due to the broad coverage of this course, the specific topics and concepts treated may vary. Commonly presented subjects include the general movements of the sky and history of astronomy, followed by an introduction to basic physics concepts like Newton's and Kepler's laws of motion. The course may also provide modern details and facts about celestial bodies in our solar system, as well as differentiation between them – Terrestrial and Jovian planets, exoplanets, the practical meaning of "dwarf planets", asteroids, comets, and Kuiper Belt and Trans-Neptunian Objects. Beyond this we may study stars and galaxies, star clusters, nebulae, black holes, and clusters of galaxies. Finally, we may study cosmology—the structure and history of the universe. The lab component of this course includes hands-on exercises that work to reinforce concepts covered in the lecture, and may include additional components that introduce students to the night sky. May be repeated up to 4 credits.

Learning Outcomes

1. Students will discuss the night sky as seen from Earth, including coordinate systems, the apparent daily and yearly motions of the sun, Moon, and stars, and their resulting astronomical phenomena.
2. Students will list and apply the steps of the scientific method.
3. Students will describe the scale of the Solar System, Galaxy, and the Universe.
4. Students will explain telescope design and how telescopes and spectra are used to extract information about Astronomical objects.
5. Students will describe the formation scenarios and properties of solar system objects.
6. Students will describe gravity, electromagnetism, and other physical processes that determine the appearance of the universe and its constituents.
7. Students will describe methods by which planets are discovered around other stars and current results.
8. Students will describe the structure, energy generation, and activity of the sun.
9. Students will compare our sun to other stars and outline the evolution of stars of different masses and its end products, including black holes. 1
10. Students will describe the structure of the Milky Way and other galaxies and galaxy clusters. 1
11. Students will describe the origin, evolution, and expansion of the universe based on the Big Bang Theory and recent Astronomical observations. 1
12. Students will describe conditions for life, its origins, and possible locations in the universe.

ASTR 1116. Introduction to Astronomy Lab, Special 1 Credit (1)

This lab-only listing exists only for students who may have transferred to NMSU having taken a lecture-only introductory astronomy class, to allow them to complete the lab requirement to fulfill the general education requirement. Consent of Instructor required. , at some other institution). Restricted to Las Cruces campus only.

Prerequisite(s): Must have passed Introduction to Astronomy lecture-only.

Learning Outcomes

1. Course is used to complete lab portion only of ASTR 1115G or ASTR 112
2. Learning outcomes are the same as those for the lab portion of the respective course.

ASTR 1120G. The Planets Lecture & Laboratory 4 Credits (3+2P)

Comparative study of the planets, moons, comets, and asteroids which comprise the solar system. Emphasis on geological and physical processes which shape the surfaces and atmospheres of the planets. Laboratory exercises include analysis of images returned by spacecraft. Intended for non-science majors, but some basic math required. May be repeated up to 4 credits.

Learning Outcomes

1. Students will describe the sky as seen from Earth, the apparent daily and yearly motions of the Sun, Moon, planets and stars, and resulting astronomical phenomena.
2. Students will apply the process of the scientific method in an astrophysical setting.
3. Students will describe the structure of the solar system and explain the development of the currently accepted model of solar system formation.
4. Students will explain how telescopes and spectra are used to extract information about astronomical objects.
5. Students will describe properties of minor solar system objects, such as dwarf planets, moons, asteroids, meteoroids, and comets.
6. Students will compare and contrast bulk and unique properties of the Terrestrial and Jovian worlds.
7. Students will describe how gravity and other physical processes determine the appearance of the solar system and its constituents.

ASTR 301V. Revolutionary Ideas in Astronomy 3 Credits (3)

Examines recent fundamental scientific revolutions that have shaped our view of Earth and the universe. Topics in astronomy range from exoplanets to black holes to dark energy and raise questions about the very nature of how we use the scientific method to see the unseen, and how this shapes science research today.

Prerequisite(s): Any general education science course.

ASTR 305V. The Search for Life in the Universe 3 Credits (3)

Use of information from several of the sciences to explore the likelihood that life exists elsewhere in the universe. Subjects include an overview of historical ideas about the possibility of life elsewhere in the universe, the chemistry and biology of life on Earth, recent explorations for life within our solar system, and current search strategies for life in the universe and their scientific basis.

ASTR 308V. Into the Final Frontier**3 Credits (3)**

Exploration of space: a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. Same as HNRS 308V.

ASTR 400. Undergraduate Research**1-3 Credits**

Supervised individual study or research. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

ASTR 401. Topics in Modern Astrophysics**3 Credits (3)**

This course is designed for students interested in astrophysics who have some background in math and physics and want to learn about basic astrophysics and interesting current topics. The course will cover basic astrophysical concepts such as orbital mechanics, light, and radiative processes and transfer. These concepts will be applied to the discussion of exciting modern topics involving planets, exoplanets, stars, galaxies, and/or cosmology, with topical emphasis determined by the instructor.

Prerequisite(s): MATH 1521G and (PHYS 2110 or PHYS 1310G).

ASTR 402. Astronomical Observations and Techniques**3 Credits (3)**

Designed for students interested in astrophysics who have some background in math and astronomy and want to learn about techniques for obtaining and analyzing astronomical data. This course will review the properties of light and discuss the process of experimental design. The course will describe basic observational tools such as telescopes and detectors. It will discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for. Some topics in basic astronomical data analysis will be discussed, with topical emphasis determined by the instructor. Some simple data analysis projects will be assigned. May be repeated up to 3 credits.

Prerequisite: MATH 1511G and (PHYS 2140 or PHYS 1320G) and (ASTR 1120G, ASTR 1115G, or ASTR 401).

Learning Outcomes

1. Review the properties of light and discuss the process of experimental design.
2. Describe basic observational tools such as telescopes and detectors.
3. Discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for.
4. Discuss topics in basic astronomical data analysis.

ASTR 403. Fundamentals of Astronomy**3 Credits (3)**

This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology. While this course is designed for first year graduate students, it is also cross-listed as a undergraduate course for students who have already had some exposure to astronomy and are prepared for a fast-paced review of fundamental topics and concepts in astronomy. Undergraduates will have a reduced homework load. Consent of Instructor required. Crosslisted with: ASTR 505.

Prerequisite(s): ASTR 401 or demonstrated background in astronomy and problem solving.

ASTR 500. Seminar**1 Credit (1)**

Organized group study treating selected topics.

ASTR 503. Fundamentals of Astrophysics**3 Credits (3)**

This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

Learning Outcomes

1. Ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics.
2. Discuss orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

ASTR 506. Dynamics and Hydrodynamics**3 Credits (3)**

Graduate level course on basic stellar dynamics and fundamentals of hydrodynamics. May be repeated up to 3 credits.

Learning Outcomes

1. Learn and be able to apply basics of stellar dynamics and hydrodynamics.

ASTR 535. Observational Techniques**3 Credits (3)**

Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss an introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.

ASTR 545. Stellar Spectroscopy**3 Credits (3)**

This course covers the physics of stellar atmospheres with emphasis on using spectra as a diagnostic tool for understanding the properties of stars. Topics include spectral classification, radiative transfer, gas equilibrium physics, line and continuum opacities, adiabatic and superadiabatic convection, and extraction of observed quantities from spectra for deducing physical conditions of the source.

ASTR 555. Galaxies I**3 Credits (3)**

Fundamentals of the properties of galaxies and galaxy components, including stars and stellar populations, gas and dust, central black holes, and dark matter. Includes a detailed description of the properties of the Milky Way Galaxy.

ASTR 565. Stellar Interiors**3 Credits (3)**

Internal constitutions of stars, computation of stellar models, and stellar evolution.

ASTR 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental.

ASTR 599. Master's Thesis**1-15 Credits (1-15)**

Master's level research in astrophysics or observational astronomy. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

ASTR 600. Pre-dissertation Research**1-15 Credits**

Research.

ASTR 601. Thesis Proposal Preparation**1 Credit (1)**

This is a one-credit course that introduces students to Departmental expectations regarding the Thesis Proposal and provides rigorous training in proposal-writing. Drawing heavily from the presentation in the course textbook, *Writing Science* by Joshua Schimel, students will practice devising, developing, and proposing three new ideas for astronomical research over the course of the academic term. Classroom activity will consist of a mixture of short lecture-discussions and focused peer-editing sessions; homework will consist of readings and writing assignments. While the course will assist students in developing their thesis proposals, its topics are general enough to be useful for any proposal. Students taking Pre-Dissertation Research in their fifth semester are required to register for this course, while students in their fourth and fifth years who have not yet defended their thesis proposals are strongly encouraged to join them. This course should not change the total number of credits for which students are expected to register in a semester

Corequisite: ASTR 600.

Learning Outcomes

1. Provide continuing programmatic/structural support to students as they transition from structured coursework/cumes to unstructured thesis work.
2. Suppress the temptation for students to distance physically starting in the third year.
3. Optimize balance between programmatic progress and ongoing research/outreach commitments.
4. Clarify thesis proposal expectations and improve consistency between experiences of different students.
5. Suppress thesis proposal inflation.
6. Train students in ideation and proposal writing.

ASTR 605. Interstellar Medium**3 Credits (3)**

Basics of radiative transfer and processes in the interstellar medium. Properties of dust and infrared emission from grains. Applications to neutral atomic and molecular gas and ionized plasmas in galaxies. May be repeated up to 3 credits.

ASTR 616. Galaxies II**3 Credits (3)**

Galaxy formation within a cosmological context. Topics include an introduction to cosmology, the growth of linear and nonlinear structures, the formation of dark matter halos, galaxy growth and feedback processes, and their observational signatures in the intergalactic and circumgalactic media.

ASTR 620. Planetary Processes**3 Credits (3)**

Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.). Restricted to Astronomy Majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.)

ASTR 621. Planetary System Formation**3 Credits (3)**

The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy. May be repeated up to 3 credits. Restricted to: ASTR majors.

ASTR 630. Advanced Methods in Astrophysics**3 Credits (3)**

Provides basic background in numerical and statistical methods relevant to astrophysical research. Topics include a review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics. May be repeated up to 3 credits.

Learning Outcomes

1. Perform basic background in numerical and statistical methods relevant to astrophysical research.
2. Review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics.

ASTR 670. Heliophysics, Space Plasmas, and Space Weather**3 Credits (3)**

Explore the Sun and its processes. the heliosphere, and its interactions with the planets. Topics include: A introductory description of space weather and its physics; energy interaction with the space environment; the quiet Sun and its interactions with planetary atmospheres (with an emphasis on Earth); Magnetohydrodynamics; frozen-in flux; the solar wind; magnetized fluid dynamics; the active Sun(flares and coronal mass ejections); the effects of Space Weather. May be repeated up to 3 credits.

Learning Outcomes

1. Manipulate the equations of electromagnetism for any astrophysical plasma, and thereby predict the behavior of any plasma under specific conditions.
2. Use the equations of electromagnetism to explain temporal and spatial size scales throughout the heliosphere.
3. Interpret the role magnetism plays in both the storage and release of energy in plasmas.
4. Analyze the effect and impact of solar particles and radiation on Earth, and at other planets.

ASTR 671. Solar Astrophysics**3 Credits (3)**

Solar astrophysics, including observational and theoretical aspects of the Sun's atmosphere. Although focused on the Sun, the course will be conducted so be of general interest to all astronomy graduate students

Learning Outcomes

1. Develop critical thinking skills in study the solar atmosphere.
2. Asses the validity of solar MHD and other approximations in uncovering the physics of the Sun.
3. Investigate the evolution of solar features at multiple size scales.
4. Determine the connections of the solar plasma oscillations and particle acceleration to energy release processes.

ASTR 698. Special Topics.**1-9 Credits**

Special topics.

ASTR 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

AUTO-AUTOMOTIVE TECHNOLOGY

AUTO 102. Electrical Measuring Instruments**2 Credits (1+2P)**

Selection, operation, and care of electrical measuring instruments.

AUTO 111. Automotive Mechanics Basics**4 Credits (4)**

Basic maintenance procedures of the major components of the automobile using service repair manuals, hand and power tools, precision measurement equipment, fasteners and chemicals. Restricted to: Community Colleges only.

AUTO 112. Basic Gasoline Engines**5 Credits (2+6P)**

Principles of gasoline engine operation. Identification, design, function of engine components; engine disassembly and reassembly; trouble shooting, and rebuilding heads.

AUTO 113. Automotive Electricity and Electronics PT I**4 Credits (2+4P)**

Topics include mastery of DC electricity, use of digital multimeters, troubleshooting electrical problems in starting, charging and accessory systems. Restricted to Community Colleges only.

AUTO 114. Automotive Electricity and Electronics PT II**4 Credits (2+4P)**

Advanced AC and DC automotive electronic circuits. Troubleshooting electronically controlled components including supplemental restraint systems and convenience accessories. Restricted to Community Colleges campuses only.

Prerequisite: AUTO 113.

Learning Outcomes

1. Understand and demonstrate safety rules related to electronically controlled automotive systems.
2. Diagnosis and demonstrate knowledge of series, parallel, and combination circuits, and their applications as applied to automotive repair.
3. Demonstrate use of wiring diagrams as a diagnostic aide.
4. Demonstrate use of meters, handheld labsopes, scan tools, and other diagnostic equipment.
5. Demonstrate use of repair manuals, both hard copy and electronic.
6. Demonstrate knowledge, diagnose and repair Air Bag Supplemental Inflatable Restraint systems
7. Demonstrate knowledge, diagnose and repair various convenience electronic systems.
8. Interpret customer concerns, create and complete a diagnostic routine and successfully repair an electrical problem.
9. Diagnose and repair starting and charging systems.

AUTO 115. Automotive Engine Repair**4 Credits (2+4P)**

Principles of gasoline engine operation. Identification of engine parts, operation, and function. Disassembly and reassembly. Engine problem diagnoses (cooling system, lubrication system, engine noises). Restricted to Community Colleges only. May be repeated up to 5 credits.

Learning Outcomes

1. Understand internal combustion engine theory
2. Identify all components of an engine and their function
3. Identify worn engine components and determine necessary repairs
4. Effectively present engine issues and corrections using verbal and written communication
5. Diagnose cooling system issues and the effect on various components
6. Rebuild/ reassemble an engine to specifications
7. Understand the operation and rationale of forced induction
8. Identify methods of increasing engine efficiency

AUTO 117. Electronic Analysis and Tune-Up of Gasoline Engines**5 Credits (2+6P)**

Theory and operation of ignition and emission control systems and fuel system. Use of troubleshooting equipment and diagnostic equipment.

Prerequisite: AUTO 120 or consent of instructor.

AUTO 119. Manual Transmission/Clutch**5 Credits (2+6P)**

Manual transmission, transfer cases, and clutch operating principles. Students will diagnose problems, remove and replace, disassemble, repair, and assemble units.

AUTO 120. Electrical Systems**4 Credits (2+4P)**

Troubleshooting and repair of starters, alternators, and associated circuits. Reading electrical diagrams, diagnosis and repair of electrical accessories.

Prerequisite: consent of instructor.

AUTO 122. Automotive Brakes**4 Credits (2+4P)**

Focus is on theory, diagnosis, and service of drum, disc, and anti-lock braking systems, brake component machining, hydraulic component reconditioning, friction and hardware replacement. Restricted to Community Colleges only.

AUTO 123. Job Shadowing**1 Credit (1)**

Observing a professional in a real-world work setting, while gaining on-the-job training. Student will meet in a weekly class or online. May be repeated up to 1 credit.

Learning Outcomes

1. Work with colleagues in the diagnosing and repair of automobiles
2. Understand basic tool needs to meet industry requirements
3. Prepare for various pay scales (straight time, flat-rate, hourly)
4. Understand daily operations in a live shop setting
5. Understand the roles in the automotive field to include Technician, Service Writer, Shop Foreman, and Service Manager

AUTO 124. Automotive Heating and Air Conditioning**4 Credits (2+4P)**

R12 and R134A air conditioning systems maintenance diagnosis and repair. R12 to R134A conversion procedures. Troubleshooting automatic temperature controls and leak detection. Restricted to Community Colleges only.

AUTO 125. Brakes**5 Credits (2+6P)**

Theory of operation, diagnosis, repair, and maintenance of disc and drum brakes; safety and use of special tools.

AUTO 126. Suspension, Steering, and Alignment**5 Credits (2+6P)**

Types of steering systems, suspension maintenance and repair, four-wheel alignment procedures.

AUTO 127. Basic Automatic Transmission**4 Credits (2+4P)**

Theory and operation of the automatic transmission; maintenance, troubleshooting, diagnosis, and repair of components.

AUTO 129. Automotive Steering and Suspension**4 Credits (2+4P)**

Diagnosis/service of suspension components including shocks, springs, ball joints, manual and power steering systems and four wheel alignment are some areas covered. Restricted to Community Colleges only.

AUTO 130. Introduction to Transportation Industry**3 Credits (3)**

State and national traffic statutes that relate to the trucking industry. A Commercial Driver's License Learner's Permit will be obtained through successful completion of the course.

Prerequisites: Must be 18 years of age, have a current driver's license and consent of instructor.

AUTO 131. Class A CDL**3 Credits (1+4P)**

Instruction in how to perform proper pre-trip inspection; hands-on training with a tractor-trailer unit on the backing range and street driving to develop skills necessary to pass Class A DCL exam. Restricted to Community Colleges campuses only.

Prerequisite(s): Class A CDL restricted license (permit) and either restriction of D.O.T.

AUTO 132. Automotive Air-Conditioning and Heating Systems**4 Credits (2+4P)**

Theory and operation, reading schematic diagrams, troubleshooting, repair, and replacement operations performed.

AUTO 137. Fuel Systems and Emission Controls**4 Credits (2+4P)**

Covers theory and operation of fuel system and emission control. Troubleshooting, vacuum diagrams, overhaul, repair and adjustment of carburetion and fuel injection.

Prerequisites: AUTO 117 or consent of instructor.

AUTO 139. Automotive Computer Controls**4 Credits (2+4P)**

Same as OEPM 139.

AUTO 160. Hybrid\Electric Vehicles**4 Credits (2+4P)**

Theory and operation of Hybrid and Electric vehicles with emphasis on electrical motor subsystems and battery management systems. May be repeated up to 4 credits.

Prerequisite: AUTO 113, AUTO 115.

Prerequisite/Corequisite: AUTO 205.

Learning Outcomes

1. Use automotive scanners and test equipment effectively
2. Explain the difference between hybrid and electrical vehicles
3. Identify faulty electrical components and determine necessary repairs
4. Effectively present issues and corrections using verbal and written communication
5. Demonstrate proper safety when working with hybrid/EV batteries
6. Demonstrate knowledge of differences between hybrid and fully electric vehicles and their benefits
7. Perform routine service on hybrid and electric vehicles

AUTO 162. Advanced Non-Structural Repair I**4 Credits (2+4P)**

This course will involve the students in all phases of minor non-structural collision damage repairs. It will encompass sheet metal repair, advanced panel replacement and alignment.

Prerequisite(s): AUTO 161.

AUTO 163. Advanced Non-Structural Repair II**4 Credits (2+4P)**

This course is a continuation of AUTO 162 with emphasis in all phases of minor non-structural damage repair. The student will be instructed in sheet metal repair and panel alignment as well as the R&I of automotive glass and related components.

Prerequisite(s): AUTO 162.

AUTO 164. Automotive Industry Collision Repair I**4 Credits (2+4P)**

This advanced course is a continuation of AUTO 161, 162, and 163. This course will incorporate all areas of major non-structural collision damage repair. Through practical application the student will learn how to effectively repair all heavy collision damage using current I-CAR repair standards and procedures.

Prerequisite(s): AUTO 163.

AUTO 165. Automotive Industry Collision Repair II**4 Credits (2+4P)**

This advanced course is a continuation of AUTO 164 with emphasis on time efficiency. This course will involve the student in all areas of major collision damage repair. The student will be exposed to all applicable I-CAR industry procedures and standards involved in sheet metal and composite panel repair.

Prerequisite(s): AUTO 164.

AUTO 172. Introduction to Automotive Refinishing**4 Credits (2+4P)**

This course is designed to incorporate all aspects of surface preparation, paint safety, refinishing materials, and refinishing fundamentals. Students will receive instructions for the application of acrylic enamel and base coat/clear coat refinishing systems.

AUTO 174. Intermediate Automotive Refinishing**4 Credits (2+4P)**

This course encompasses all areas of surface preparation, damage repair and refinishing procedures that are necessary for achieving a proper spot repair. Students will also be exposed to safe work habits in the refinishing area and correct automotive detailing procedures.

Prerequisite(s): AUTO 172.

AUTO 176. Automotive Color Adjustment & Blending**4 Credits (2+4P)**

This course will help develop the skills needed to match any type of paint. It will expose the student to color theory, color evaluation, color matching, and other color adjustment factors. The student will be instructed in multiple panel paint blending techniques as well.

Prerequisite(s): AUTO 174.

AUTO 178. Automotive Overall Refinishing**4 Credits (2+4P)**

This course encompasses all areas of automotive refinishing. This advanced course is a continuation of AUTO 176 with emphasis in achieving industry refinishing times and standards consistent with that of I-CAR. The student will be exposed to surface preparation and refinishing techniques involved with overall coat/clear coat refinishing system.

Prerequisite(s): AUTO 176.

AUTO 181. Frame and Structural Repair**4 Credits (2+4P)**

This course will involve the student in all areas of frame and structural damage repairs. Through theory and practical application, the student will learn how to diagnose and repair various types of damage include: mash, twist, sag, and side sway. This course will expose the students to safe work habits while using measuring and straightening equipment.

Prerequisite(s): AUTO 165.

AUTO 182. Structural Panel Replacement**4 Credits (2+4P)**

This course is a continuation of AUTO 181 with infancies in structural panel replacement. The student will be exposed to frame and unibody measuring equipment and their proper use in sectioning procedures. Through theory and practical application the student will learn how to ID structural components, properly separate spot welds, position and weld new body panels in place.

Prerequisite(s): AUTO 181.

AUTO 200. Engine Performance**4 Credits (2+4P)**

Theory and operation of ignition, emission control systems, fuel systems, and exhaust systems. Use of troubleshooting and diagnostic equipment. May be repeated up to 4 credits.

Prerequisite/Corequisite: AUTO 113, AUTO 115.

Learning Outcomes

1. Use automotive scanners and test equipment effectively
2. Identify all emission control components of an engine and their function
3. Identify faulty ignition components and determine necessary repairs
4. Effectively present engine issues and corrections using verbal and written communication
5. Diagnose fuel system issues and the effect on various components
6. Demonstrate knowledge of differences between different fuel delivery methods and their benefits
7. Understand the operation and rationale of forced induction
8. Identify methods of increasing engine efficiency

AUTO 201. Engine Performance I**4 Credits (2+4P)**

Theory, function, service and analysis of engine related subsystems including ignition, fuel, starting, and charging systems. Emphasis is placed on diagnosis and operation of electronic engine control management systems. Restricted to Community Colleges only.

AUTO 203. Engine Performance II**4 Credits (2+4P)**

Study of engine management systems and emission control systems, their function and relationship to vehicle performance and air pollution. Emphasis is placed on the analysis and repair of non-compliant vehicles. Restricted to Community Colleges only.

Prerequisite: AUTO 201.

Learning Outcomes

1. Be able to explain basic electrical theories.
2. Be able to explain basic and advanced engine designs and engine operating theory.
3. Be able to explain engine cooling and lubricating systems.
4. Be able to explain intake and exhaust systems
5. Test battery, starting and charging systems
6. Test ignition systems including point type, electronic trigger type, and distributor-less systems.
7. Test automotive fuel system including fuel tanks, lines, filters and pumps.
8. Test basic electronic fuel injection systems.
9. Test automotive computer input devices and controlled devices
10. Demonstrate ability to work with PC based automotive software including Alldata,

AUTO 205. Manual Drive Train and Axles**4 Credits (2+4P)**

Operation, diagnosis, maintenance, repair or replacement of manual transmissions, clutch assemblies, differentials, drivelines, axles, and manual transaxles. Restricted to Community Colleges only.

AUTO 206. Automatic Transmissions**5 Credits (2+6P)**

Operation, diagnosis, maintenance, and repair of automatic transmissions including rear wheel drive, front wheel drive, and electronically controlled transmissions and transaxles. Restricted to Community Colleges only.

AUTO 208. Introduction to Alternative Fueled Vehicles**3 Credits (3)**

Course will familiarize student with conditions that are resulting in the alternative fueled vehicle movement as well as the design and safety precautions unique to each alternative fuel. Propulsion systems covered include electric vehicles, bio-fueled vehicles, hybrid-electric vehicles and hydrogen powered vehicles, along with other emerging technologies as appropriate. Restricted to: Community Colleges only.

Prerequisite(s): AUTO 113 and AUTO 114.

AUTO 209. Hybrid Vehicle Service Techniques**3 Credits (3)**

Designed for experienced automotive technicians, this course will cover safety procedures, design, operational overview and service techniques as well as minor diagnosis and repair of all classifications of hybrid-electric vehicles. Each student must possess legal Class 'O' high voltage gloves and liners to attend this class. Restricted to: Community Colleges only.

Prerequisite(s): AUTO 113 and AUTO 114.

AUTO 210. Light Diesel**4 Credits (2+4P)**

Theory and operation of light duty diesel engines with emphasis on highway diesel usage including major engine subsystems and fuel management systems. May be repeated up to 4 credits.

Prerequisite/Corequisite: AUTO 113, AUTO 115.

Learning Outcomes

1. Use automotive scanners and test equipment effectively
2. Identify all emission control components included on diesel engines and their function
3. Identify faulty emission components and determine necessary repairs
4. Effectively present engine issues and corrections using verbal and written communication
5. Diagnose fuel system issues and the effect on various components
6. Demonstrate knowledge of differences between different fuel delivery methods and their benefits
7. Understand the operation and rationale of forced induction
8. Identify methods of increasing engine efficiency

AUTO 221. Cooperative Experience I**1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

Prerequisite: consent of instructor.

AUTO 255. Special Problems in Automotive Technology**1-5 Credits**

Individual studies in areas directly related to automotive technologies.

May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

AUTO 290. ASE Certification Preparation**1 Credit (1)**

This is the capstone course for the Automotive Technology Program and is a requirement for graduation. Consent of Instructor required. Restricted to: AUTO majors. Restricted to Community Colleges campuses

Learning Outcomes

1. write technical reports explaining customers complaint(s), specific component malfunction(s) and related problems to include repair procedures, specifications, parts and costs associated with each specific repair
2. determine, categorize and document component or systems malfunctions which will be discussed in class
3. adequately identify safety hazards associated with electrical, electronic, hydraulic, pneumatic and mechanical systems before participating in any lab project
4. use a systematic approach to identify, diagnose and repair new hydro, electrical and mechanical systems
5. identify all related parts and components before attempting to repair each system
6. clearly identify and understand the specific function of each component before these systems and subsystems are dismantled for repairs
7. demonstrate proficiency in locating, identifying and following procedures for repairs as outlined on the Mitchell and All-DATA computer information systems
8. retrieve all phases of automotive information needed to repair the following: Electrical and Electronics, Engine Repair, Engine Performance, Automatic transmissions, Heating And Air Conditioning Systems
9. demonstrate proficiency in the proper usage of on-board computer scanners used to identify and properly diagnose possible malfunction within a specific on-board computer system 1
10. demonstrate proficiency in the proper use of scanners, information and vehicle specifications to determine needed repairs 1
11. identify, evaluate, diagnosis and repair electrical, electronic and mechanical systems and subsystems

AUTO 295. Special Topics**1-6 Credits**

Topics to be announced in the Schedule of Classes.

AXED-AGRICULTURAL EXTN EDUC

AXED 1110. Introduction to Agricultural, Extension, and Technology Education

3 Credits (3)

Orientation to programs, philosophies, competencies and leadership skills needed by professionals in agricultural and technology education, extension education, agricultural communications, and related career opportunities in industry, governmental agencies, and international organizations.

Learning Outcomes

1. Orient student to the AXED Department and their role as students.
2. Explore career opportunities (and the related skill sets needed for success) in public schools, career and technical institutions, the cooperative extension service, community, and international development, agricultural communications, agricultural industry associations and public service (e.g., NMDA and USDA).
3. Develop an understanding of the self-leadership skills needed to be effective in a variety of professional and personal environments.
4. Familiarize students with the aspects included within a total program in agricultural or technology education.
5. Strengthen skills in oral and written communications.

AXED 1130. Techniques in Agricultural Mechanization

3 Credits (2+2P)

Development of competencies in agricultural mechanics including safety, tool identification, operation and maintenance of hand and power tools, cold metal, drafting, and plumbing procedures. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

Learning Outcomes

1. To understand basic drafting language used in orthographic and isometric drawings.
2. To develop an understanding of the proper use and safety of basic hand and power tools.
3. To develop skills needed to operate basic hand and power tools correctly.
4. To develop an understanding of surveying methods and building layout for construction.
5. To develop an adequate level of competence in workshop techniques.
6. To prepare students to properly teach and demonstrate these techniques to others who may use them as a means of earning a living.

AXED 2110. Metal Fabrication

3 Credits (2+4P)

Instruction and skill development in process and procedures of metal fusion, including gas and electric welding techniques, safety, and oxy-acetylene cutting and welding. Designed to improve mechanical skills needed in agriculturally related occupations in education and industry.

Learning Outcomes

1. To develop students understanding and appreciation for metal fabrication, design and teaching.
2. To develop in the student an adequate level of competence in shop work techniques, so that the student may be able to properly teach and demonstrate multiple metal fabrication techniques to others who may use them as a mean of earning a living.
3. To develop the student's fundamental techniques in shielded metal arc welding, oxy-acetylene welding and cutting operations, metal inert gas welding (MIG), and gas tungsten-arc welding as needed in repair and construction of agricultural equipment.
4. Student will understand appropriate shop management techniques and have an appreciation for mechanized agriculture.
5. To assist the student in developing an understanding and comprehension of the fundamental principles that apply to the area of basic shop work included in this course; such as proper selection of electrodes, oxy-acetylene filler rods, welding processes best suited for given welding conditions, the proper tool for the job, etc.
6. To develop in the student comprehension of safety practices that apply to the areas of basic shop work, tools, and equipment required in the course.

AXED 2130. Early Field-Based Experience

2 Credits (2)

First Hand view of the roles of professional educators through field experiences with Cooperative Extension or other government agencies. Includes 4 weeks of classroom instruction and 30 hours of observation in a work setting. Consent of Instructor required. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify successful characteristics, tips and strategies that an agricultural education professional may use as part of their program.
2. Identify key components of an agricultural education program
3. Actively observe a local agricultural education program.
4. Identify ways that your agency program networks and interacts with clientele and community

AXED 2996. Special Topics

1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Student can only take up to 6 credits per semester, and will not be able to have more than 12 credits count towards their degree. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

AXED 3115. Small Engine Technology

3 Credits (2+2P)

Development of competencies in small gasoline engines; theory, operation, design, maintenance and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3120. Agricultural Structures**3 Credits (2+3P)**

Selection and use of agricultural building materials. Design, construction, and maintenance of agricultural structures. Development of competencies in carpentry, concrete, electricity, masonry, and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3130. Advanced Technology in the Agricultural Mechanization**3 Credits (2+3P)**

Students will construct a project in the area of agricultural mechanization under the direction of instructor. Project must be completed within a semester and of sufficient complexity for 3 credits.

Prerequisite: AXED 1130 and AXED 2110 or consent of instructor.

AXED 3150. Philosophy and Methods of Contests**3 Credits (3)**

Covers the roles that career development events (contests) play in agricultural and technology education and in extension programs. Topics include competition and cooperation, winning and losing, ethics, use of community resources, and academic and employability skills taught through contests. Coaching as a teaching method is introduced and expanded. Students will assist with the coordination of various career development events. May be repeated up to 3 credits.

AXED 3210V. John Muir: Lessons in Sustainability**3 Credits (3)**

This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influenced his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable future. May be repeated up to 3 credits.

AXED 3996. Special Topics**1-4 Credits (1-4)**

Course addresses specific subjects and issues as identified by department. Topics and credits to be announced in the Schedule of Classes. Students can only take up to 4 credits per semester and no more than 6 credits of the course may be applied to a degree. May be repeated up to 12 credits.

Learning Outcomes

1. Various

AXED 4110. Management of Change, Diffusion, and Adoption of Innovations**3 Credits (3)**

Factors that influence the rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 5110. May be repeated up to 3 credits.

Learning Outcomes

1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 4210. Curriculum Development and Assessment in Agricultural Education**3 Credits (3)**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.

Prerequisite: 2.5 GPA.

AXED 4215. Developing Excellent Programs in Career and Technical Education**3 Credits (3)**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability for the program are discussed. May be repeated up to 3 credits.

AXED 4220. Methods for Teaching Agricultural and Technology Education**3 Credits (3)**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. May be repeated up to 3 credits.

Prerequisite: GPA of 2.5 or above.

AXED 4230. Directed Teaching in Agricultural or Technology Education**15 Credits (15)**

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural or technology education supervising teachers. Consent of Instructor required.

Prerequisite: AXED 4215, AXED 4220 and consent of instructor.

AXED 4235. Directed Teaching in Extension Education**3-12 Credits (3-12)**

Four-to-fourteen-week, professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Consent of instructor required. May be repeated up to 12 credits.

AXED 4510. Introduction to Research Methods**3 Credits (3)**

Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Students must be in junior standing to enroll. May be repeated up to 3 credits.

AXED 4520. Methods in Career and Technical Laboratory Instruction**2 Credits (2)**

For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors. May be repeated up to 2 credits.

AXED 4610. Leadership On Agricultural and Natural Resource Issues**3 Credits (3)**

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. May be repeated up to 3 credits.

AXED 4620. Methods of Teaching Biological, Earth and Physical Sciences in Agriculture**3 Credits (3)**

Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered focus on incorporating biological, earth and physical sciences into agricultural instruction and may include: Tissue culture, animal anatomy, hydroponics microscopy, electrophoresis, microbiology, soils and plant nutrients, water quality, water systems, entomology, integrated pest management, and renewable energy applications. Students develop their own modules and/or experiments.

AXED 4710. 4-H Youth Development**1 Credit (1)**

On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension. May be repeated up to 1 credit.

AXED 4715. The FFA Organization: An Overview**1 Credit (1)**

Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education. May be repeated up to 1 credit.

AXED 4991. Undergraduate Research**1-4 Credits (1-4)**

Research experience in agricultural, extension, and technology education with applications to selected issues and problems. May be repeated up to 4 credits.

AXED 4997. Independent Study in Agricultural, Extension, or Technology Education**1-3 Credits (1-3)**

Specific subjects are agreed upon by the student and instructor. Students must be juniors or seniors to enroll. May be repeated up to 6 credits.

AXED 5110. Management of Change, Diffusion, and Adoption of Innovations**3 Credits (3)**

Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 4110 with differential assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 5130. Advanced Agricultural Mechanization**3 Credits (3)**

This course provides an overview of advanced agriculture mechanization techniques and concepts. Precision farming tools and applications will be introduced, and hands-on activities will be utilized. A discussion about applications and benefits will frame the course lectures.

Learning Outcomes

1. Describe and classify various precision agriculture software/hardware technologies
2. Demonstrate usage of various precision agriculture technologies
3. Understand decision making processes associated with implementation of precision agriculture technologies
4. Analyze the costs, time, and application of precision agriculture technologies

**AXED 5150. Strategic Communications Campaigns and Evaluation
3 Credits (3)**

Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple channels (e.g., written, visual, social). Students will also evaluate the materials for their audience reach, visibility, and effectiveness. Strategic communications involve planning, prioritizing, and evaluating. Students will gain experience implementing these needs with a real-world client to keep materials relevant to industry demands. May be repeated up to 3 credits.

Learning Outcomes

1. Identify communications-related needs with a client or stakeholder in the food, agricultural, natural resources, and human (FANH) sciences.
2. Define priority communications areas to address client or stakeholder needs.
3. Direct a communications plan with channels, tactics, steps, and timelines.
4. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
5. Evaluate the reach, visibility, and effectiveness of the communications materials.
6. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.
7. Publish portfolio materials showcasing the client's brand.

**AXED 5155. Youth Program Development and Management
3 Credits (3)**

Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Taught with AXED 415 with differentiated assignments for graduate students. May be repeated up to 3 credits.

**AXED 5160. Teaching Adults in Nonformal Settings
3 Credits (3)**

The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Taught with AXED 430 with differentiated assignments for graduate students. May be repeated up to 3 credits.

**AXED 5165. History and Philosophy of Agricultural and Extension Education
3 Credits (3)**

History and Philosophy of Agricultural and Extension Education serves as a foundational core of graduate studies in Agricultural and Extension Education. The design of the course is to acquaint the student with a broad perspective of cultural and historical conditions that have shaped both education and agricultural education as we know it today. The primary purpose of this course is to explore the nature of selected philosophical concepts and philosophers and to evaluate their influence upon education and agricultural/extension education in the United States. In addition to philosophical influences, students will examine the historical events and governmental laws and policies that have evolved and developed our educational system of today.

Learning Outcomes

1. Understand the principles of philosophy in education and agricultural and extension education.
2. Recognize the influence of philosophers and philosophical documents upon education and agricultural and extension education.
3. Analyze the historical foundations that have established our modern educational system.
4. Develop a personal philosophy regarding education and agricultural education.

**AXED 5170. Keys for Agricultural and Rural Development
3 Credits (3)**

Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally. May be repeated up to 3 credits.

**AXED 5210. Curriculum Development and Assessment in Agricultural Education
3 Credits (3)**

This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.

Prerequisite: 2.5 GPA.

**AXED 5215. Developing Excellent Programs in Career and Technical Education
3 Credits (3)**

Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Taught with AXED 445 with differentiated assignments for graduate students. May be repeated up to 3 credits.

**AXED 5220. Methods for Teaching Agricultural and Technology Education
3 Credits (3)**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Taught with AXED 446. May be repeated up to 3 credits.

Prerequisite: GPA of 3.0 or above.

AXED 5230. Directed Teaching in Agricultural or Technology Education
4-9 Credits (4-9)

Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Students need to have completed a teaching methods class prior to enrolling in this course. Consent of Instructor required.

AXED 5235. Directed Teaching in Extension Education
4-9 Credits (4-9)

Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Taught with AXED 448 with reduced credit hours for graduate students. Restricted to AXED majors. May be repeated up to 9 credits.

AXED 5310. New Mexico Water Issues
3 Credits (3)

Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated. May be repeated up to 3 credits.

AXED 5320. Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences
3 Credits (3)

The purpose of this course is to introduce risk and crisis as interdisciplinary concepts, reviewing theoretical frameworks from a variety of fields and perspectives, such as communication, social psychology and public relations. Students will develop a theoretical understanding of all aspects of strategic communication pertaining to risks. Using readings and reflective writings, you will understand how individuals cognitively process risks and how to leverage trust and knowledge to facilitate public understanding. In addition, you will learn crisis communication and management from an organizational perspective. Using case studies and discussions, students will be able to recommend strategies for managing crises occurred to agricultural and natural resource industries.

Learning Outcomes

1. Develop a critical understanding of theoretical and conceptual frameworks related to risk and crisis communications
2. Use an integrated framework to analyze the communication strategies used by the agricultural and natural resource industries
3. Recommend effective and ethical strategies for managing actual and potential crises

AXED 5510. Research Methods
3 Credits (3)

Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. May be repeated up to 3 credits.

AXED 5515. Data Collection and Analysis
3 Credits (3)

Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended. May be repeated up to 3 credits.

AXED 5610. Leadership on Agricultural and Natural Resource Issues
3 Credits (3)

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students. May be repeated up to 3 credits.

AXED 5615. Effective Management of Volunteer Programs
3 Credits (3)

For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. May be repeated up to 3 credits.

AXED 5993. Workshops in Agricultural, Extension, and Technology Education
1-3 Credits (1-3)

Workshop procedures applied to current trends in agricultural, extension, and technology education. A maximum of seven credits will count towards a degree. May be repeated up to 7 credits.

AXED 5994. Creative Component
1-4 Credits (1-4)

For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. A maximum of six credits will count towards a degree. May be repeated up to 88 credits.

AXED 5996. Special Topics
1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Students can take only a maximum of four credits per semester and no more than six credits will count towards a degree. May be repeated up to 6 credits.

AXED 5998. Internship/Cooperative Experience
1-6 Credits (1-6)

Supervised professional on-the-job learning experience. May be repeated up to 6 credits.

AXED 5999. Master's Thesis
1-6 Credits (1-6)

Thesis. May be repeated up to 88 credits.

B A-BUSINESS ADMINISTRATION

B A 105. Special Topics
1-3 Credits

Current topics in business and economics.

B A 291. Business Administration and Economics Internship and Cooperative Education I**1-3 Credits**

Introduction and applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience, and not by the work experience.

B A 305. Leadership Training for COB Ambassadors**1 Credit (1)**

Leadership development for volunteers serving as COB student ambassadors, focusing on COB undergraduate business degree programs, NMSU student services, public speaking and public relations.

B A 391. Business Administration and Economics Internship and Cooperative Education II**1-3 Credits**

Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.

B A 490. Selected Topics**3 Credits (3)**

Prerequisites vary according to the seminar being offered.

B A 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisite: junior or above standing and consent of instructor.

B A 500. Macroeconomic Essentials**1 Credit (1)**

Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems. Restricted to: MBA Major majors majors.

B A 501. Quantitative Tools for the MBA**1 Credit (1)**

An overview of critical topics in math and statistics that will provide a quantitative foundation for students entering the Master of Business Administration program. Admission to the MBA program.

B A 545. Business Ethics**3 Credits (3)**

Understanding of business ethics, social responsibilities of business organizations, and personal codes of conduct. Complexities of moral reasoning and principles of ethical behavior.

B A 550. Special Topics**3 Credits (3)**

Interdisciplinary seminar in selected current business topics.

Prerequisite(s): Prerequisites vary according to the seminar being offered.

B A 590. Professional Paper/Presentation**3 Credits (3)**

Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Restricted to: MBA majors.

Prerequisite(s): Minimum of 3.0 average in: ACCT 503, BLAW 502, BFIN 503, and MKTG 503 or AEEC 551.

B A 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. A maximum of 3 credits may be earned.

Prerequisite: consent of instructor.

B A 599. Master's Thesis**15 Credits**

Thesis.

BCHE-BIOCHEMISTRY

BCHE 140. Introduction to Biochemistry**1 Credit (1)**

A description of the nature of inquiry in biochemistry, especially with respect to the interaction of chemistry and biology. Both historical development and topics of current interest will be discussed. Graded S/U.

BCHE 241. Introduction to Research in Biochemistry**1-3 Credits**

Techniques and procedures of biochemical research. May be repeated for a maximum of 3 credits.

Prerequisites: 8 credits of chemistry and 3.0 GPA in chemistry.

BCHE 341. Survey of Biochemistry**4 Credits (3+3P)**

Basic principles of biochemical processes and the structure/function of the major classes of biomolecules, with introductions to metabolism and the central dogma of biochemistry. The chemical and biological properties of major biomolecules (DNA, proteins, May be repeated up to 4 credits.

Prerequisite(s): C- or better in CHEM 2115 or CHEM 314.

BCHE 395. Biochemistry I**3 Credits (3)**

Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism.

Prerequisite(s): C or better in CHEM 314.

BCHE 396. Biochemistry II**3 Credits (3)**

Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 H.

Prerequisite(s): C or better in BCHE 395.

**BCHE 396 H. Biochemistry II Honors, Lecture and Laboratory
4 Credits (2.5+3P)**

Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 with additional work required. May be repeated up to 3 credits.

Prerequisite: C- or better in BCHE 395.

Learning Outcomes

1. Recognize the essential biochemical reactions and enzymatic mechanisms required for nucleic acid, amino acid, and fatty acid synthesis.
2. Learn the biochemical reaction mechanisms associated with key elements of the central dogma of molecular biology.
3. Identify the reactions and enzymes required for DNA maintenance and replication, transcription and RNA polymerization, and the translation of mRNA to primary amino acid sequence and protein synthesis.
4. Conduct experiments safely.
5. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation.
6. Obtain relevant DNA sequence information from public databases.
7. Transform and isolate plasmid DNA to be used for cloning procedures.
8. Design DNA specific primers for PCR reactions.
9. Perform restriction digest and ligation reactions. 1
10. Analyze DNA sequence to validate the outcome of recombinant DNA experimentation. 1
11. Demonstrate scientific dissemination skills by attending scientific seminars or review primary literature and provide summary via written or oral presentation.

**BCHE 424. Experimental Biochemistry I
3 Credits (1.25+6P)**

Laboratory techniques required for experimentation with recombinant DNA such as nucleic acid isolation and purification, polymerase chain reaction (PCR), sequence analysis, and directed mutagenesis using genetic material from both prokaryotic and eukaryotic organisms.

Prerequisite(s): C- or better in BCHE 395, and BCHE 396 or GENE 315.

Learning Outcomes

1. Conduct experiments safely
2. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation
3. Obtain relevant DNA sequence information for gene of interest from public databases
4. Make buffers and reagents necessary for transforming and isolating plasmid DNA from E. coli
5. Transform and isolate plasmid DNA to be used for cloning of gene of interest
6. Design primers for PCR to enrich gene of interest from genomic DNA
7. Analyze DNA sequence and choose appropriate restriction enzymes for cloning gene of interest
8. Design primers for PCR to incorporate restriction sites at the ends of gene of interest
9. Perform restriction digest on plasmid DNA and PCR products 1
10. Perform ligation reaction to combine gene of interest with plasmid DNA 1
11. Analyze sequence of plasmid containing gene of interest to validate the outcome of experimentation

**BCHE 425. Experimental Biochemistry
3 Credits (1.25+6P)**

Introduction to fundamental techniques used to explore structure and function of biological macromolecules such as proteins, carbohydrates, lipids, and nucleic acid. Course covers analyzing and reporting experimental data; enzymology; quantitative methods to determine biological molecules; basic principles of electrophoresis, chromatography, and spectroscopic immunochemistry. May be repeated up to 3 credits.

Prerequisite: C- or better in BCHE 395.

Learning Outcomes

1. Understand and implement various methods of protein purification as well as qualitative and quantitative analysis of protein preparations
2. Become proficient in absorbance and fluorescence spectroscopy.
3. Determine ligand binding parameters.
4. Understand and measure enzyme kinetics and inhibition.
5. Perform basic protein crystallization and structure determination.
6. Develop skills in scientific writing and presentation.

BCHE 432. Physical Biochemistry**3 Credits (3)**

This course focuses on modern Biophysical techniques used in protein and nucleic acid research. Topics are covered in some detail at the theoretical level. The course content is delivered entirely by podcast. Podcast contributions are from several different faculty from within their particular area(s) of expertise. Topics covered include (but are not limited to): biomolecular NMR, atomic force microscopy, light scattering, circular dichroism, ultracentrifugation, isothermal titration calorimetry, positron emission tomography, computerized tomography, ultrasound, functional MRI, protein fluorescence, mass spec/ proteomics, protein molecular dynamics simulations, and X-ray diffraction. Course credit qualifies for minor degree in chemistry as a physical-analytical chemistry emphasis. CHEM 431, or CHEM 433.

Prerequisite(s): One semester of undergraduate physical chemistry, e.g.

BCHE 440. Biochemistry Seminar**1 Credit (1)**

Introduction to current literature in biochemistry and molecular biology. Selected topics in the field will be presented by the faculty. Students will present written and oral reports from literature searches. Restricted to: BCHE majors.

Prerequisite(s): BCHE 395.

BCHE 441. Advanced Research in Biochemistry**1-3 Credits**

Investigation of biochemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

BCHE 451. Special Topics**1-3 Credits**

Same as CHEM 451. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

BCHE 455. Independent Studies**1-3 Credits**

Independent studies directed by consulting faculty.

Prerequisite: consent of instructor.

BCHE 542. Biochemistry I**3 Credits (3)**

Relationship between macromolecular structure and function. Basic enzymology. Energy metabolism.

Prerequisite(s): CHEM 314 and CHEM 431 or CHEM 433; or BCHE 395 or equivalent.

BCHE 545. Molecular and Biochemical Genetics**3 Credits (3)**

An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology. Same as BIOL 545.

Prerequisite: BCHE 542 or equivalent.

BCHE 546. Biochemistry II**3 Credits (3)**

Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation.

Prerequisite: BCHE 542 or BCHE 395 with consent of instructor.

BCHE 598. Special Research Programs**1-3 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded S/U.

BCHE 599. Master's Thesis**15 Credits**

May be repeated for a maximum of 6 credits. Same as CHEM 599.

BCHE 600. Research**1-15 Credits**

May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.

BCHE 647. Physical Biochemistry**3 Credits (3)**

Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 451.

Prerequisite(s): 'C' or better in CHEM 431 or CHEM 433 or BCHE 542.

BCHE 649. Topics in Biochemistry**1-3 Credits**

Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.

BCHE 650. Advanced Seminar**1 Credit (1)**

Discussion of biochemical research in progress that relates to a doctoral candidate's thesis research. Intended for students who have earned a master's degree or the equivalent and has made significant research progress for preparation of the doctoral dissertation. May be repeated for a maximum of 3 credits.

BCHE 700. Doctoral Dissertation**20 Credits**

May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.

BCIS-BUSINESS COMPUTER SYSTEMS

BCIS 1110. Introduction to Information Systems**3 Credits (3)**

Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communications, data analysis, information management and decision-making.

Learning Outcomes

1. Describe the social impact of information literacy and systems in relation to commerce, education, and personal activities.
2. Explain how to use the information resources legally, safely, and responsibly in relation to ethical, security, and privacy issues.
3. Evaluate bias, accuracy and relevance of information and its sources.
4. Use productivity tools for communications, data analysis, information management and decision-making.
5. Describe and use current information systems and technologies

BCIS 321. Introduction to Software Development and Programming**3 Credits (3)**

Computer algorithm development and programming logic in the context of business information systems using current programming environments. Includes program design, data types, data structures, control structures, arrays, and principles of object oriented programming.

Prerequisite(s): C- or better in BCIS 1110; and MATH 1215.

BCIS 338. Business Information Systems I**3 Credits (3)**

Application, design and use of computerized information systems in business environment.

Prerequisite(s): BCIS 1110 or consent of instructor.

BCIS 350. Information Systems Analysis and Design**3 Credits (3)**

An introduction to the analysis and design of secure information systems.

Prerequisite(s): Concurrently with BCIS 338 or consent of instructor.

BCIS 461. Business Analytics I**3 Credits (3)**

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Crosslisted with: BCIS 561.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 466. Business Analytics II**3 Credits (3)**

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Crosslisted with: BCIS 566.

Prerequisite(s): BCIS 461 or consent of the instructor.

BCIS 475. Database Management Systems**3 Credits (3)**

Design, development, and use of database management systems in the business environment.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 480. E-Commerce Security**3 Credits (3)**

Introduction to securing network-based applications from internal and external threats. Fundamentals of network security, including TCP/IP, firewalls, intrusion detection, and vulnerability.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 482. Management of Information Security**3 Credits (3)**

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security.

Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 485. Enterprise Resource Planning**3 Credits (3)**

This course covers concepts in enterprise resource planning (ERP).

Topics include how ERP integrates business processes across functional areas—such as the procurement process and the sales order process—and how businesses use ERP information systems in day-to-day operations as well as for performance monitoring. SAP R/3 software will be used in several hands-on examples of ERP software as a real-world example of an ERP system.

Prerequisite(s): C- or better in BCIS 338 or BCIS 350 or ACCT 351.

BCIS 490. Selected Topics**1-3 Credits**

Current topics in business systems analysis. Consent of Instructor required.

BCIS 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of the department head. May be repeated for a maximum of 3 credits.

Prerequisites: junior or above standing and consent of instructor.

BCIS 502. Business Information Systems**3 Credits (3)**

Analysis of information systems as integral parts of business organizations, including the responsibility of management to understand their capabilities and uses in handling the organization's information flow and providing appropriate information for decision making.

Prerequisite: graduate students only.

BCIS 550. Information Systems Analysis and Design**3 Credits (3)**

Information systems development methodologies and the system life cycle. Justifying and managing systems development projects. Not open to students who have taken BCIS 350. Students must be Graduate Students to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Describe foundations of systems development.
2. Explain systems development life cycle and key methodologies.
3. Depict how to conduct planning in systems development.
4. Determine and structure system requirements.
5. Apply principles and guidelines to design interfaces, forms and databases.
6. Understand the major issues in the systems implementation and maintenance.

BCIS 561. Business Analytics I**3 Credits (3)**

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Not open to students who have taken BCIS 461. No S/U or audit option.

Prerequisite: BCIS 338.

Learning Outcomes

1. Identify the reasons for and the evolution of computerized support in managerial decision making.
2. Describe the business intelligence (BI) methodology and concepts.
3. Identify and explain various types of analytics.
4. Explain the nature of data in the context of BI and Business Analytics.
5. Describe statistical modeling and its relationship to business analytics.
6. Apply descriptive and inferential statistics techniques.
7. Explain the importance of data/information visualization and apply different types of visualization techniques.
8. Explain the basic concepts of data warehousing.
9. Explain data integration and the extraction, transformation, and load (ETL) processes. 1
10. Describe the essence of business performance management (BPM). 1
11. Describe balanced scorecard and Six Sigma as performance measurement systems. 1
12. Explain the objectives and benefits of data mining. 1
13. Learn the standardized data mining process. 1
14. Enhance your communication (presentation and report writing), creative thinking, problem-solving, and analytical skills.

BCIS 566. Business Analytics II**3 Credits (3)**

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Not open to students who have taken BCIS 466. No S/U or audit option.

Prerequisite: BCIS 561.

Learning Outcomes

1. Identify and explain various types of analytics.
2. Define data mining as an enabling technology for business analytics.
3. Learn the standardized data mining processes and the different methods and algorithms of data mining.
4. Build working knowledge of the existing data mining software tools.
5. Describe text analytics and understand the need for text mining.
6. Learn the process of carrying out a text mining project and the common methods for sentiment analysis.

BCIS 575. Database Management Systems**3 Credits (3)**

Design, development, and use of database management systems in the business environment. Not open to students who have taken BCIS 475. May be repeated up to 3 credits.

Prerequisite: BCIS 350.

Learning Outcomes

1. Describe fundamental database terminology and explain the primary features of database management systems. (Cognitive Level: Understand)
2. Explain relational database concepts, such as primary key and referential integrity, normalization, and triggers. (Cognitive Level: Understand)
3. Explain what a data model is. (Cognitive Level: Understand)
4. Write SQL--the standard language of relational databases--at an advanced level. (Cognitive Level: Apply)
5. Design a data model and code/implement it as a database solution using SQL. (Cognitive Level: Create)
6. Describe the fundamental concepts of Data Warehouses. (Cognitive Level: Understand)
7. Design and build data warehouses. (Cognitive Level: Create)
8. Describe emergent database topics such as graph databases, big data, data lakes, NoSQL. (Cognitive Level: Understand)
9. Demonstrate how a database can be used with Python programming language and MSExcel. (Cognitive Level: Apply)

BCIS 580. E-Commerce Security**3 Credits (3)**

Introduction to securing network-based applications from both internal and external threats. Fundamentals of network security including TCP/IP, firewalls, intrusion detection and vulnerability discussed. Not open to students who have taken BCIS 480. No S/U or audit option. May be repeated up to 3 credits.

Prerequisite: C- or better in BCIS 460 or consent of instructor.

Learning Outcomes

1. Communication (COMM): Students are effective communicators; a) Students can write effectively. (write); b) Students can make effective oral presentations. (oral)
2. Diversity (DIVERSITY): Students can demonstrate knowledge of diversity; a) Students can identify stereotypes; b) Students can discern between helpful and detrimental stereotypes. c) Students can identify individual characteristics that affect social perception and strategies that counter negative influence on social perception.
3. Information Technology (TECH): Students are effective users of information technology; a) Students can acquire information using relevant information technologies; b) Students can use information technology to manipulate information into a form usable in business decision making; c) Students can use information technology to disseminate information to others.
4. Critical Thinking: Students can solve problems and think critically; a) Students can solve problems. (PROB SOLV); b) Students can think critically. (THINK)
5. Legal and Ethical: Students can recognize legal and ethical issues; a) Students can recognize legal issues. (LEGAL); b) Students can recognize ethical issues. (ETHICS)

BCIS 582. Management of Information Security**3 Credits (3)**

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Not open to students who have taken BCIS 482. May be repeated up to 3 credits.

Prerequisite: BCIS 1110 or equivalent.

Learning Outcomes

1. Explain the fundamental concepts of the management of information security within the context of organizations.
2. Describe commonly used information systems (IS) security standards and guidelines.
3. Create IS security management and policy as well as risk management plans.
4. Explain the behavioral aspects of IS security and discuss the development of security culture within organizations.
5. Explain the technical aspects of IS security, including issues related to cryptography and network security.
6. Describe and evaluate the regulatory aspects of information system security (primarily within the United States and European Union context).

BCIS 585. Enterprise Resource Planning & Business Processes**3 Credits (3)**

Enterprise-wide information systems and their use in enterprise resource planning (ERP). This course will examine the many cross-functional business processes. Other topics include ERP implementation issues, change management, and business process re-engineering. Hands-on exercises use SAP/3 Enterprise software. Not open to students who have taken BCIS 485. May be repeated up to 3 credits.

Prerequisite: C- or better in ACCT 351 or BCIS 502.

Learning Outcomes

1. Business processes common to most businesses, including order processing, procurement, inventory management, etc
2. How a business process often spans different functional areas of the business: accounting, marketing, etc.
3. How enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
4. Process modeling to depict the sequence of tasks completed in a business process.
5. Master data common to most businesses (e.g. customer, vendor, inventory, etc.).
6. The issues involved in implementing an ERP system.

BCIS 590. Special Topics**1-3 Credits (1-3)**

Seminars in selected current topics in business computer systems. May be repeated up to 3 credits.

Prerequisite(s): Vary according to topic being offered.

BCIS 598. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of department head. A maximum of 3 credits may be earned.

Prerequisite: consent of instructor.

BCT-BUILDING CONSTRUCTION TECH**BCT 100. Building Trades I****8 Credits (2+12P)**

Equipment and general safety. Human relations, building construction surveying, footings, foundation form work, framing, sheathing, insulation. Basic electrical wiring and plumbing. Classroom instruction, on-the-job training, and problem solving.

BCT 101. Introduction to Construction I**2 Credits (2+1P)**

Basic safety, including personal protective equipment, how to perform basic construction tasks safely, and what to do if an accident occurs. Includes basic construction methods. May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

Corequisite(s): BCT 102;BCT 103.

BCT 102. Introduction to Construction II**2 Credits (2+1P)**

Introduction to power and hand tools, blueprints, and basic rigging hardware and techniques. May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

Corequisite(s): BCT 101;BCT 103.

BCT 103. Introduction to Construction Laboratory**3 Credits (3)**

Provides students the opportunity to practice skills they have acquired in BCT 101 and BCT 102. It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the National Center for Construction and Education Research (NCCER) Carpentry Program. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Corequisite(s): BCT 101; BCT 102.

BCT 104. Woodworking Skills I**3 Credits (1+4P)**

Use and care of hand tools and elementary power tools, safety procedures, and supervised project construction.

BCT 105. Woodworking Skills II**3 Credits (1+4P)**

Advanced woodworking skills to include use of advanced power tools, power tool safety, and supervised construction.

Prerequisite: BCT 104 or consent of instructor.

BCT 106. Woodworking Theory and Practice**3 Credits (2+2P)**

History of wood manufacturing, industrial techniques, wood characteristics, stains and finishes. Design and construction of minor wood projects.

BCT 109. Plumbing I**3 Credits (2+3P)**

Covers orientation to the trade. Students will learn about materials used in the plumbing industry and the different types of plumbing fixtures. It includes task-oriented projects in which the students apply many of the skills and knowledge that are presented through the National Center for Construction and Education Research (NCCER) Plumbing Program. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): BCT 101, BCT 102. Restricted to Community Colleges campuses only.

BCT 110. Blueprint Reading for Building Trades**4 Credits (2+4P)**

Same as DRFT 151, OEET 101, OEPB 110.

BCT 111. Small Equipment Maintenance and Repair
4 Credits (2+4P)

Covers small engine theory, troubleshooting and repair, auto maintenance, hydraulic theory and repair lubricants, batteries and scheduled tool maintenance. Restricted to: Community Colleges only.

BCT 114. Basic Carpentry
3 Credits (1+4P)

Covers orientation to the trade; wood building materials, fasteners, and adhesives; detailed description and explanations of hand-operated and power tools, including safety; framing basics including laying out and constructing of wood floors, walls and ceilings and includes roughing in of door and window openings. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Corequisite(s): BCT 115; BCT 116.

BCT 115. Carpentry Level I
3 Credits (1+4P)

Describes the various kinds of roofs and provides instructions for lay out of the different roofing systems. Describes the various types of windows, skylights, and exterior doors and provides instruction for installation. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Corequisite(s): BCT 114; BCT 116.

BCT 116. Basic Carpentry Lab
2 Credits (2)

Provides students the opportunity to practice skills they have acquired in BCT 114 and BCT 115. It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the National Center for Construction and Education Research (NCCER) Carpentry Program. May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

Corequisite(s): BCT 114; BCT 115.

BCT 117. Plumbing 1A
3 Credits (2+2P)

This course will introduce students to the plumbing profession. Students will become familiar with the tasks and responsibilities of plumbing professionals in the construction industry and gain a basic knowledge of the plumbing field. Restricted to Community Colleges campuses only.

BCT 118. Math for Building Trades
3 Credits (3)

Geometry, algebra, arithmetic, and basic trigonometry pertaining to mathematical applications in the building trades field. Same as OEET 118, DRFT 118, OEPB 118.

Prerequisite: CCDM 103 N.

BCT 123. Residential Wiring I
3 Credits (2+3P)

Introduction to residential electrical wiring trade, electrical safety practices, basic electrical circuits and theory, reading and interpreting applicable construction prints/drawings, introduction to basic National Electric Code (NEC), and preparation for entry-level employment in residential electrical wiring. Restricted to Community Colleges campuses only.

BCT 130. Professional Development and Leadership
1 Credit (1)

As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing or participating in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: BCT majors. Graded: S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

BCT 150. Forklift Operation
1 Credit (1)

Classroom instruction and hands-on practice to prepare students to operate a forklift safely in the workplace. Students will have the opportunity to earn a forklift operator's permit. Consent of Instructor required. Restricted to Community Colleges campuses only.

BCT 200. Building Trades II
8 Credits (2+12P)

Continuation of BCT 100: roofing; exterior and interior finish; masonry; door, window, and cabinet installation.

BCT 206. Advanced Cabinetmaking
3 Credits (1+3P)

Advanced cabinetmaking skills, to include expert use of hand and power tools, professional construction and finishing techniques.

Prerequisites: BCT 105, BCT 106, or consent of instructor.

BCT 209. Plumbing II
3 Credits (2+3P)

Continuation of BCT 109. Provides students the opportunity to gain more practice in the skills and knowledge learned in Plumbing I. Students will install fixtures and run the various plumbing supply lines from Plumbing Level I. The course included hands on projects in which the students apply many of the competencies that have been presented through the National Center for Construction and Education Research (NCCER) Plumbing Program. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): BCT 109.

BCT 217. Building and the Environment
3 Credits (3)

Introduction to LEED's, and Green Building Fundamentals, sustainability, sustainable design and green building evaluating cost implication of green building. Describes site development; managing site water runoff, improving a project's water use efficiency. Discusses renewable energy sources, and introduces student to generating power on-site using renewable energy sources, improving a building's indoor environment quality, improving the building industries' environmental performance and environmental aspects of building maintenance, re-use and conservation. Restricted to: Community Colleges only.

BCT 218. Plumbing 2
4 Credits (2+4P)

This course builds on the skills and knowledge students have gained in previous BCT introduction to plumbing courses, focusing on installation of plumbing systems. Students will become familiar with the tasks and responsibilities of plumbing professionals in the construction industry and gain a basic knowledge of the plumbing field.

Prerequisite(s): BCT 117 and BCT 119.

BCT 219. Weatherization in Construction
3 Credits (2+2P)

Introduction to industry weatherization standards and practices utilized in the construction of buildings for the purpose of energy conservation. Economic and environmental impacts of the use of energy in heating and cooling building will be examined.

Prerequisite(s): BCT 101, BCT 102 and BCT 103.

BCT 221. Cooperative Experience I
1-4 Credits

Supervised cooperative work program. Student is employed in an approved occupation and is supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

Prerequisite: consent of instructor.

BCT 223. Residential Wiring II**3 Credits (2+3P)**

Introduction to electrical raceways and fittings; electrical conductors and cables; basic electrical construction drawings, residential electrical services, and electrical test equipment. Restricted to Community Colleges campuses only.

Prerequisite(s): BCT 123.

BCT 255. Special Topics**1-6 Credits (1-6)**

Topics to be announced in the Schedule of Classes . May be repeated up to 12 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

BCT 290. Special Problems in Building Technology**1-4 Credits**

Individual studies in areas directly related to building technologies.

Prerequisite: consent of instructor.

BEST-BORDERLAND & ETHNIC STUDIES

BEST 1110G. Introduction to Borderlands and Ethnic Studies**3 Credits (3)**

The field of Ethnic Studies is about 1) critical knowing and 2) unapologetic imagining and creation of a better, more just world. This course explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. The past few decades have borne witness to increasing global diversity and cross-border migrations, which has led many in the U.S. to imagine the nation as "post-racial." Simultaneously, increasing clashes that can only be described as "racist" have led people to wonder about the dark racist underpinnings of a society that believes it has achieved the goals put forth by the distinct and intersecting Civil Rights Movements of the 1960s. Perhaps now, more than any other time in history, there is earnest desire to talk about race and racism and unpack these constructs/activities/outcomes. This course is designed to inform us about how colonization, racism, and hegemony function. Secondly, it is designed for self and collective exploration of these somewhat broad and abstract concepts in an applied manner. Finally, it is designed for us to arrive at a shared understanding of the decolonial turn, or a re-humanization imperative. How do we understand, apply, and heal as these activities each relate to coloniality of power

Learning Outcomes

1. Learn and understand broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies "canon."
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in "everyday life" via course activities
5. Gain a better understanding of your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance
6. Learn mindful and constructive ways to engage peers about sometimes "difficult" topics like race, power, and privilege.

BEST 300. History and Theories in Borderlands and Ethnic Studies**3 Credits (3)**

This course provides a basic understanding of the history and theoretical foundations of Borderlands and Ethnic Studies. It engages in an in-depth analysis of the concepts and history that resulted in reshaping the way we understand race, national borders, immigration, education, and the law. It examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. It explores the history of social movements in the U.S. that sought to illuminate social inequalities and social justice issues and investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. Throughout the course we will ask the following questions: How does the idea of race permeate our everyday lives? How does education reinforce our understandings of race? How do historical struggles over economic resources and political power illuminate the formation and development of the borderlands? How does law relate to power relations and mechanisms of social control?

Learning Outcomes

1. Explain how race and ethnicity has been historically socially constructed in the U.S.
2. Understand how the social construction of race and ethnicity is related to issues of social control.
3. Understand how the idea of race helps to reinforce existing power arrangement.
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the Borderlands.
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Understand how race relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression
9. Gain a better understanding of your own worldviews and opinions towards issues of race, class, , gender, nationalism, migration, borders, social movements, and resistance 1
10. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race

BEST 400. Capstone in Borderlands and Ethnic Studies
3 Credits (3)

This seminar is designed to culminate the undergraduate minor by summarizing knowledge and experience garnered in pre-courses: Intro to Borderlands & Ethnic Studies, History & Theories of Ethnic Studies, as well as the chosen gender course, the chosen race, history & education course, and the chosen elective course. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback.

Prerequisite/Corequisite: BEST 1110G, BEST 300, and either (AFST 2140G, CCST 3120V, or NATV 4110) and either (AFST 4110, CCST 3110, or NATV 4210).

Learning Outcomes

1. Design and develop a semester-long project that draws upon all previous BEST in collaboration with instruction and peers.
2. Re-explain vis-a-vis previous courses how race and ethnicity has been historically socially constructed in the U.S.
3. Critically engage and “think outside the box” when discussing the conceptualization and history of the idea of race.
4. Work with a community organization, agency, or other group to collaborate on the final project.
5. Present project to class as a final product.

BEST 450. Special Topics in Borderlands and Ethnic Studies
3 Credits (3)

This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles. May be repeated up to 9 credits.

Learning Outcomes

1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicanx Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 510. Foundations in Borderlands & Ethnic Studies
3 Credits (3)

This seminar explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. In addition to race, other social locations such as gender, class, and sexual orientation are explored as intersectional. The course uses traditional lecture format, multi-media, guest lecturers, and engaging activities inside and outside the classroom to apply materials in tangible and impactful ways. May be repeated up to 6 credits.

Learning Outcomes

1. Identify, compare and contrast broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies “canon.”
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in “everyday life” via course activities.
5. Demonstrate mindful and constructive ways to engage peers about sometimes “difficult” topics like race, power, and privilege.

BEST 511. Methodologies in Borderlands and Ethnic Studies
3 Credits (3)

This seminar introduces the practice of indigenizing research methods by looking beyond the canon of Eurocentric methodologies that have often trapped marginalized communities outside of normative time frames. Through the deconstruction of colonial apparatuses and their influence on research methods, the class explores key concepts in decolonizing research to move us to new understandings of communities according to indigenous traditions that privilege ancestral ways of knowing. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

BEST 512. Theories in Borderlands and Ethnic Studies**3 Credits (3)**

This seminar provides a basic understanding of theoretical foundations of Borderlands and Ethnic Studies. It also examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. Social movements in the U.S. that sought to illuminate social inequalities and social justice issues are explored. The course investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how race and ethnicity has been socially constructed in the U.S.
2. Recognize how the social construction of race and ethnicity is related to issues of social control
3. Describe how the idea of race helps to reinforce existing power arrangements
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the borderlands
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Distinguish how biopolitics relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain an understanding of and be able to evaluate your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance.
10. Critically engage and "think outside the box" when discussing the conceptualization and development of the idea of race.

BEST 513. Capstone in Borderlands and Ethnic Studies**3 Credits (3)**

This seminar is designed to culminate the graduate certificate by summarizing knowledge and experience garnered in pre-courses: BEST 510, 511, 512. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback.

Prerequisite(s): BEST 510; BEST 511; BEST 512.

Learning Outcomes

1. Summarize, concisely, key concepts and frameworks learned in BEST seminars.
2. Express, reflectively, what these concepts and frameworks mean in the context of historical and contemporary social issues related to power dynamics created and exacerbated by hierarchies associated with racial, gender, class, sexual orientation and other positionalities.
3. Design a culminating project that encapsulates a nuanced understanding of Borderlands and Ethnic Studies, ensuring its impact on a broader audience.
4. Generously evaluate cohort mates' projects as they progress during semester.
5. Receive feedback about one's own project and apply those comments and critiques in useful ways and in collaboration with instructor.
6. Create/generate a culminating project that aligns with rubrics in the most effective manner possible.
7. Present work to cohort and instructor in an effective way.

BEST 550. Advanced Special Topics in Borderlands and Ethnic Studies**3 Credits (3)**

This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles. May be repeated up to 9 credits.

Learning Outcomes

1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicana Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BFIN-BUSINESS FINANCE

BFIN 2110. Introduction to Finance

3 Credits (3)

Introduces tools and techniques of financial management. Includes time value of money; financial planning, diversification and risk; debt and equity investment decisions; and financial statement analysis.

Prerequisite(s): OATS 106 or higher; OATS 120 or ACCT 2110; ECON 1110G or ECON 2110G.

Learning Outcomes

1. Explain the time value of money and its application in decision-making, including calculating present and future values of single payment and series of payments.
2. Identify the major sources of external long-term financing for corporations.
3. Explain risk-return tradeoff as it relates to diversification.
4. Differentiate the role of finance from other related disciplines such as accounting and economics.
5. Demonstrate knowledge of capital markets and securities (debt and equity).
6. Describe basic types of financial ratios and their uses.
7. Demonstrate the ability to prepare cash flows and make qualitative judgments on the relevance of the changes from one time frame to another.

BFIN 303V. Personal Financial Planning and Investing in a Global Economy

3 Credits (3)

Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.

BFIN 311. Financial Futures Markets

3 Credits (3)

Same as AEEC 311.

BFIN 322. Principles of Insurance

3 Credits (3)

Theory and practice of insurance and its economics and social significance; review of the major lines of insurance including life, health, and property liability insurance.

BFIN 323. Life/Health/Employee Benefits

3 Credits (3)

Approaches to problems of employee security from the perspective of businesses. Topics including pensions, profit-sharing plans, 401(k) plans, group life and health plans, and flexible benefit programs. The course also addresses individual life, health, and annuity contracts within a financial planning context. May be repeated up to 3 credits.

Prerequisite/Corequisite: BFIN 322.

Learning Outcomes

1. Understand the various types of life insurance and annuity contracts and their uses.
2. Know how life and health insurers are regulated.
3. Analyze the insurance marketplace and health care reform.
4. Review contractual provisions of life insurance policies.
5. Understand how human life value is determined.
6. Calculate life contingencies and pricing of life and health insurance.

BFIN 324. Property and Liability Insurance

3 Credits (3)

Analysis of property and liability insurance with emphasis on handling of commercial exposures. Review of property and liability company operations including rate making and insurance accounting. May be repeated up to 3 credits.

Prerequisite/Corequisite: BFIN 322.

Learning Outcomes

1. Determine if an insurance policy covers an insurance claim.
2. Calculate the amount payable for an insurance claim.
3. Choose the insurance needed for a given situation.
4. Define frequently used insurance terms and acronyms.
5. Explain the responsibility of the various insurance functions.

BFIN 325. Real Estate Principles and Law I

3 Credits (3)

Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BLAW 325.

BFIN 326. Business Risk Management

3 Credits (3)

The operational risks faced by firms and the study of various methods of handling these risks, including loss prevention, risk retention, self-insurance, corporate insurance programs, and capital markets. May be repeated up to 3 credits.

Prerequisite/Corequisite: BFIN 322.

Learning Outcomes

1. Develop an understanding of risk management and its basic concepts.
2. Discuss alternative approaches to risk management and develop the knowledge to analyze the features and benefits of enterprise risk management.
3. Gain knowledge regarding risk assessments and the fundamental requirements for a successful risk management program through risk classification and risk analysis tools and techniques.
4. Apply risk control techniques to the identified risks and learn the importance of insurance and risk transfer.
5. Explore the importance of risk management strategy and risk management policy while understanding the techniques to implement a successful risk management program.
6. Develop knowledge about creating a risk-aware culture and understanding an organization's risk appetite.
7. Understand risk governance and how corporate governance requirements impact an organization's risks.
8. Learn risk assurance and risk reporting within an organization to expand their knowledge regarding internal control and corporate social responsibility.

BFIN 341. Financial Analysis and Markets

3 Credits (3)

Financial analysis for business financing and investing decisions. Prerequisites ACCT 2110, ECON 2110G, ECON 2120G, MATH 1220G, A ST 311 or MATH 1350G.

BFIN 355. Investments**3 Credits (3)**

Analysis of investment risks and rewards and of the problems of portfolio selection and management. Operation of the securities market.

Prerequisite(s): BFIN 341 with a grade of C- or better.

BFIN 360. Financial Information Technology**3 Credits (3)**

Integrated use of electronic financial information resources with spreadsheet and word processing applications in investigating financial issues and solving financial problems.

Prerequisite(s): a grade of C- or better in BFIN 341 or consent of instructor.

BFIN 385. Analysis of Financial Markets and Institutions**3 Credits (3)**

Analysis of the financial system, emphasizing its institutions and instruments.

Prerequisite(s): BFIN 341 with a grade of C- or better.

BFIN 391. Finance Internship and Cooperative Education I**1-3 Credits**

Introduction and application of finance principles in a work environment. Open only to students in the finance major or minor who will be working with an approved employer in a finance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required.

BFIN 392. Insurance Internship and Cooperative Education I**1-3 Credits (1-3)**

Introduction and application of insurance principles in a work environment. Open only to students in the finance major or insurance minor who will be working with an approved employer in an insurance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required. Restricted to Finance majors.

BFIN 393. Banking Internship and Cooperative Education**1-3 Credits (1-3)**

Professional banking experience with opportunities to engage in business analysis and to observe application of business principles in the management of a banking entity or a regulatory agency with banking oversight. Open only to students in the finance major or banking minor who will be working with an approved employer in a banking related position, over a period of 12 weeks or at least 300 work hours. May be repeated up to 3 credits. Consent of Instructor required.

BFIN 406. Theory of Financial Decisions**3 Credits (3)**

Contemporary financial theory. Firm valuation, investments and financing decisions, risk analysis.

Prerequisite(s): BFIN 341 with a grade of C- or better.

BFIN 421. Personal Financial Planning for Professionals**3 Credits (3)**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.

Prerequisite(s): BFIN 341, or consent of Instructor.

BFIN 435. Investment Analysis**3 Credits (3)**

Efficiency of capital markets, modern portfolio management, special topics of current interest to investment analysts.

Prerequisite: BFIN 355.

BFIN 445. Fixed Income Markets, Instruments and Derivatives**3 Credits (3)**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored.

Prerequisite(s): BFIN 341.

BFIN 455. Derivative Markets and Securities**3 Credits (3)**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles.

Prerequisite(s): BFIN 355.

BFIN 470. Real Estate Appraisal**3 Credits (2+2P)**

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to student in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with: AEEC 470.

Prerequisite(s): Junior or above standing.

BFIN 475. International Managerial Finance**3 Credits (3)**

International aspects of financial transactions, decision-making, banking and financial markets. Crosslisted with: I B 475 and BFIN 575.

BFIN 480. Management of Financial Institutions**3 Credits (3)**

Asset and liability management of financial institutions; emphasis on commercial bank management.

Prerequisite: BFIN 385 or consent of instructor.

BFIN 490. Selected Topics**1-3 Credits**

Current topics in finance.

Prerequisites: vary according to the seminar being offered.

BFIN 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

BFIN 500. Concepts in Finance**1 Credit (1)**

An overview of fundamental principles of finance necessary for prospective MBA students who do not have an undergraduate background in finance. Includes: Time value of money concepts and calculations; risk and calculation of return given appropriate risk measures; bond risk characteristics and calculation of the value of a bond; calculation of the value of common stock (determination as to whether a stock is over-valued or under-valued); and calculation of the costs of capital and capital budgeting problems using the cost of capital.

Prerequisite(s): admitted to MBA Program or consent of course department.

BFIN 503. Financial Management**3 Credits (3)**

Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions.

Prerequisite(s): BFIN 341 with a grade of B or better.

BFIN 511. Advanced Derivative Markets**3 Credits (3)**

This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC/BFIN 311 and AEEC/BFIN 511. Crosslisted with: AEEC 511. May be repeated up to 3 credits.

Learning Outcomes

1. Define risk and identify methods of managing risk
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets
3. Identify the role that derivative markets play in reducing risk
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation

BFIN 521. Personal Financial Planning for Professionals**3 Credits (3)**

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments. For Graduate students only

Learning Outcomes

1. Describe the financial planning process, assess the external environment, use goals to establish financial direction, and analyze a client's present financial position.
2. Estimate the impacts of income tax planning strategies, apply the basic process for retirement planning, and define the considerations for estate planning.
3. Evaluate the roles of various insurance products in managing risks, and recognize the professional and ethical aspects of financial planning

BFIN 535. Investment Concepts**3 Credits (3)**

Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management. For Graduate students only

Learning Outcomes

1. Model forecasted financial statements using Microsoft Excel.
2. Build financial models in Excel to estimate risk and return for individual stock.
3. Build financial models in Excel to construct an efficiently diversified portfolio.
4. Make decisions regarding investments for the Wetherbe Student-Managed Investment Fund.

BFIN 545. Fixed Income Markets, Instruments and Derivatives**3 Credits (3)**

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Assignments and exams will be differentiated from the undergraduate cross-listed course. In addition, graduate students are expected to complete a project. For Graduate students only.

Learning Outcomes

1. Describe basic features of a fixed-income security.
2. Describe mechanisms available for issuing bonds in primary markets.
3. Analyze repurchase agreements (repos) and the risks associated with them.
4. Compute invoice prices, yields, spot rates, and forward rates.
5. Compute PVPB, duration and convexity of a bond, duration of a portfolio of bonds.
6. Construct the term-structure of interest rates, Yield curve strategies.
7. Describe the process of calibrating a binomial interest rate tree to match a specific term structure.
8. Explain the principles underlying, and factors that influence, the market's pricing of CDS.
9. Explain and execute interest rate swaps.

BFIN 555. Derivative Markets and Securities**3 Credits (3)**

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Same as BFIN 455 with differentiated assignments for graduated students. For Graduate students only.

Learning Outcomes

1. Define forward contracts, futures contracts, options (call and puts), swaps, and credit derivatives and compare their basic characteristics.
2. Determine the value at expiration and profit from a long or a short position in a call or put option, or combinations such as straddles, covered calls, spreads, put-call parity etc.
3. Explain how the concepts of arbitrage, replication, and risk neutrality are used in pricing derivatives.
4. Explain how the value of an option is determined using a multiperiod-period binomial model.
5. Describe how the Black-Scholes-Merton model is used to value European options on equities.
6. Interpret each of the option Greeks.
7. Describe how a delta hedge is executed.
8. Define implied volatility and explain how it is used in options trading.
9. Describe a futures contract: long and short positions, hedging, basis risk, and hedge ratios

BFIN 575. International Managerial Finance**3 Credits (3)**

International aspects of financial transactions, decision-making, banking and financial markets. For Graduate students only.

Learning Outcomes

1. Explain and evaluate how the globalization process moves a business from a purely domestic focus in its financial relationships and composition to one truly global in scope.
2. Describe what three major corporate currency exposure arises from multinational business.
3. Define and explain the terms that are used in reference to exchange rates and currency regimes in addition to analyzing the characteristics of an ideal currency.
4. Explain how nations measure their own level of international economic activity and how that is measured by the balance of payments.
5. Show how interest rates and inflation affect each country and currency.
6. Identify the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions.
7. Distinguish between spot, forward, swaps, and other types of foreign exchange financial instruments as well as foreign currency futures and options contracts.
8. Demonstrate how both the diversifiable and non-diversifiable risks of an investor's portfolio may be reduced through international diversification.
9. Evaluate the various internal and external sources of funds available for the financing of foreign subsidiaries.

BFIN 581. Management of Financial Institutions**3 Credits (3)**

Asset and liability management of financial institutions; emphasis on commercial bank management. For Graduate students only.

Learning Outcomes

1. Describe the Financial System and Competing Financial Service Institutions.
2. Describe the impact of government policy and regulation on the banking industry.
3. Explain the array of organizational structures in Banking: Unit, Branch, Holding. Company and Electronic Services.
4. Analyze the Balance Sheets and Income Statements of Banks.
5. Measure and evaluate the performance of Banks and their principal competitors.
6. Apply different liquidity management strategies.

BFIN 590. Selected Topics**1-3 Credits (1-3)**

Current topics in finance. Taught with BFIN 490 with differentiated assignments for graduate students. Consent of instructor required.

BFIN 598. Special Research Programs**1-3 Credits**

Directed individual reading or research.

Prerequisite: consent of instructor.

BIOL-BIOLOGY**BIOL 1120G. Human Biology****3 Credits (3)**

This course is an introduction to modern biological concepts with an emphasis on the relevance to humans and their relationships with the environment.

Learning Outcomes

1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability).

BIOL 1120L. Human Biology Laboratory**1 Credit (3P)**

This course introduces exercises, experiences, and activities exploring biological concepts and theories relevant to humans and their relationship to the environment in a laboratory setting.

Prerequisite(s)/Corequisite(s): BIOL 1120G.

Learning Outcomes

1. Understand general principles of cell structure and function.
2. Understand general principles of genetics.
3. Understand basic human anatomy and physiology.
4. Communicate scientific information effectively.
5. Demonstrate an understanding of the scientific method.
6. Knowledge of appropriate laboratory skills
7. Apply quantitative reasoning and scientific thinking to real world problems.

BIOL 1130G. Introductory Anatomy & Physiology (non-majors)
4 Credits (3+3P)

This course introduces the anatomy (structure) and physiology (function) of the human body, which includes the study of basic chemistry, molecules, cells, tissues, organs, organ systems, and terminology related to these concepts. May be repeated up to 4 credits. Restricted to Community Colleges campuses

Learning Outcomes

1. (Lecture) Define and explain anatomy and physiology.
2. (Lecture) Use anatomic directional, regional, and sectional terminology related to the human body.
3. (Lecture) Explain and describe the basic chemical principles of the human body including the structure and function of carbohydrates, lipids, proteins and nucleic acids.
4. (Lecture) Develop a basic familiarity with cells and cell organelles that include cell division, DNA replication, and protein synthesis.
5. (Lecture) Describe the structure and function of the major tissues in the human body.
6. (Lecture) Identify and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
7. (Lecture) Describe the basic physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
8. (Lecture) Apply and describe the principles of homeostasis in the human body.
9. (Laboratory) Use and apply proper anatomic terms 1
10. (Laboratory) Develop skills using the microscope correctly. 1
11. (Laboratory) Identify basic tissue types. 1
12. (Laboratory) Discuss and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems. 1
13. (Laboratory) Demonstrate and describe physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.

BIOL 1190G. Contemporary Problems in Biology
4 Credits (3+3P)

Fundamental concepts of biology will be presented using examples from relevant problems in ecology, medicine and genetics. For nonscience majors only. Community Colleges only.

Learning Outcomes

1. Identify the unity and diversity of living things
2. Identify the structure and function of cells and biological molecules
3. Recognize and demonstrate patterns of inheritance
4. Describe mechanisms of evolution
5. Describe the human body systems including immune response
6. Discuss population dynamics and ecological systems
7. Describe the process of scientific inquiry, solve problems scientifically, and communicate on a scientific level
8. Apply quantitative analysis and scientific thinking to scientific and real world problems

BIOL 1996. Topics in Biology
1-3 Credits (1-3)

Introductory level coverage of biological topics. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

BIOL 2110G. Principles of Biology: Cellular and Molecular Biology
3 Credits (3)

This course introduces students to major topics in general biology. This course focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, DNA replication, transcription, and translation. Must be taken with BIOL 2110L to meet general education requirements. May be repeated up to 3 credits.

Prerequisite/Corequisite: a C- or better in MATH 1215 or higher and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).

Learning Outcomes

1. Apply the scientific method to develop and evaluate hypotheses and propose an experiment to test a scientific hypothesis related to cell biology and molecular biology.
2. Describe the distinguishing characteristics of various biological molecules (water, carbohydrates, lipids, proteins, and nucleic acids).
3. Compare and contrast the basic features of cells and how prokaryotic cells differ from eukaryotic cells.
4. Understand how organisms maintain homeostasis in a dynamic environment.
5. Describe how biological molecules are acquired and how they are subsequently used to meet the metabolic needs of organisms.
6. Describe membrane structure and function.
7. Describe and analyze the nature of bioenergetic transformations and metabolism within the cell.
8. Describe the processes of cellular respiration and photosynthesis.
9. Analyze with specific detail the processes of DNA replication, transcription, and translation. 1
10. Analyze with specific detail the types, mechanisms, and regulation of cellular division. 1
11. Assess important applications of cell and molecular biology to energy use, medicine, and other day-to-day processes.

BIOL 2110L. Principles of Biology: Cellular and Molecular Biology Laboratory**1 Credit (3P)**

This course introduces students to major topics in general biology. This course focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, genetics, DNA replication, transcription, and translation. May be repeated up to 1 credit.

Prerequisite: MATH 1215 or higher, and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).

Prerequisite/Corequisite: BIOL 2110G.

Learning Outcomes

1. Describe and apply the scientific method to solve problems in biological context
2. Demonstrate knowledge of laboratory safety skills and procedures.
3. Practice principles of scientific method while conducting laboratory activities and experiments.
4. Perform laboratory activities using relevant laboratory equipment, chemical reagents, and supplies to observe biological specimens, to measure variables, and to design and conduct experiments.
5. Operate light microscopes, prepare wet mount slides, and use stains.
6. Exhibit ability to use pipettes and other volumetric measuring devices, chemical glassware, balances, pH meters or test papers, spectrophotometers, and separation techniques, such as chromatography and/or electrophoresis to perform activities relevant to other course competencies.
7. Analyze and report data generated during laboratory activities and experiments.

BIOL 2210. Human Anatomy and Physiology I for the Health Sciences
4 Credits (3+3P)

This course is the first of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on anatomic, directional, and sectional terminology, basic cellular structure and metabolism, tissue differentiation and characteristics, and organ system structure and function; Specifically the integumentary, skeletal, muscular, and nervous systems.

Prerequisite(s)/Corequisite(s): CHEM 1120G or CHEM 1215G. Restricted to: Community Colleges only.

Learning Outcomes

1. Describe and apply anatomical terminology.
2. Describe multi cellular organization.
3. Distinguish and describe major tissue types.
4. Describe the structure and function of the integumentary system.
5. Describe the structure and function of the skeletal system.
6. Describe the structure and function of the muscular system.
7. Describe the structure and function of the nervous system.
8. Describe the structure and function of the special senses.
9. Define homeostasis and describe specific examples for the integumentary, skeletal, muscular, and nervous systems.

BIOL 2221. Human Physiology**3 Credits (3)**

Physical and chemical operation of the organs and systems of the human body. Not open to students who have passed BIOL 354 or BIOL 381.

Prerequisite(s): Grade of at least C- in BIOL 2110G; BIOL 2110L; CHEM 1215G or CHEM 1120G.

Learning Outcomes

1. Understand the central physiological principle of homeostasis
2. Be able to explain why concentration gradients are essential to maintain homeostasis
3. Understand the regulation of homeostasis by neuronal / endocrine chemical messengers
4. Understand that changes in bodily function occur throughout the entire life span of the human animal
5. Incorporate the importance of evolutionary biology to your understanding of human disease
6. Teach a physiological concept to your classmates
7. Design experiments to test physiological concepts
8. Put in plain words how the laws of thermodynamics can explain human disease

BIOL 2225. Human Anatomy and Physiology II**4 Credits (3+3P)**

This course is the second of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on specific cellular, tissue, and organ structure and physiology, and organ system structure and function; specifically the endocrine, cardiovascular, respiratory, urinary, and reproductive systems. Additionally, an analysis of these concepts is included: fluid and electrolyte balance, pregnancy, growth and development from zygote to newborn, and heredity. Restricted to: Community Colleges only.

Prerequisite(s): BIOL 2210, CHEM 1120G or CHEM 1215G.

Learning Outcomes

1. Identify and describe the major anatomical features of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.
2. Analyze the physiological roles of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems in maintaining homeostasis in the human body.
3. Explain how fluid and electrolyte balance is maintained in the human body.
4. Compare and contrast the anatomy and physiology of male and female reproductive systems.
5. Describe pregnancy from conception to parturition including human growth and development from zygote to newborn.
6. Explain heredity and genetic control.

BIOL 2310. Microbiology**3 Credits (3P)**

Introduction to the basic principles of microbiology, microbial pathogenesis, host defenses and infectious diseases. The course will emphasize concepts related to the structure and function of microorganisms, including their mechanisms of metabolism and growth. Host parasite interactions will also be emphasized, including mechanisms of microbial pathogenesis and mechanisms of host defenses against infectious diseases. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEM 1120G or CHEM 1215G or CHEM 1225G.

Corequisite(s): BIOL 2310L.

Learning Outcomes

1. Describe and compare the structure and function of prokaryotic and eukaryotic cells.
2. Describe and compare the techniques used for staining of and microscopic observation of bacteria including morphology.
3. Describe the nutritional requirements for bacterial growth and the impact of environmental factors on bacterial growth (temperature, pH, oxygen, etc.).
4. Describe and compare the mechanisms of aerobic respiration, anaerobic respiration, and fermentative metabolism.
5. Describe the mechanism of bacterial growth by binary fission, and laboratory methods used for observing and measuring bacterial growth.
6. Describe the mechanisms of bacterial DNA replication, RNA transcription, and translation, and compare and contrast with eukaryotic cells.
7. Describe the structure and replication strategies of viruses.
8. Describe and contrast mechanisms of innate nonspecific immunity and adaptive specific immunity.
9. Describe immune hypersensitivity reactions, autoimmune diseases, and immunodeficiency diseases.
10. Differentiate between host microbe relationships, mechanisms of microbial pathogenesis, differentiate between communicable and noncommunicable diseases and describe mechanisms of direct and indirect transmission of communicable diseases.

BIOL 2310L. Microbiology Lab**1 Credit (3P)**

This course will emphasize both the theory and hands-on application of techniques used in a microbiology laboratory for the growth and identification of bacterial species. Students will learn microscopy skills and staining techniques for the observation of bacteria. Students will also learn aseptic techniques used for isolation of bacteria, inoculation of cultures, and interpretation of selective and differential growth media for the identification of bacterial species.

Prerequisite: BIOL 2310 or BIOL 2320 or concurrent enrollment.

Learning Outcomes

1. Demonstrate skills of microscopy.
2. Demonstrate skills of bacterial staining.
3. Demonstrate aseptic technique for inoculation of bacterial growth media.
4. Interpret results from selective and differential media.
5. Demonstrate appropriate use of diagnostic reagents.
6. Interpret results of diagnostic assays.
7. Identify unknown bacterial species through the use of a dichotomous key, inoculation and interpretation of laboratory assays, and application of the scientific method.

BIOL 2320. Public Health Microbiology**3 Credits (3)**

This course introduces microbiology on the health profession level. It incorporates cell structure, metabolism, growth, controls of growth, infectious epidemiology, etiology, pathogenicity, and relative virulence of pathogens. It will lead to students assessing a clinical infection scenario from the microbiological perspective that includes making diagnoses based on data from appropriate diagnostic tests, investigating appropriate treatment options, and making recommendations for prevention.

Prerequisite: BIOL 2110G and BIOL 2110L.

Learning Outcomes

1. Identify key physical features of various infectious agents and describe their structure and function in the pathogen
2. Describe the microbiological, serological, biochemical and genetic tests that are used to identify infectious agents in a laboratory setting and be able to interpret test results in order to identify the pathogen
3. Explain how structural and metabolic differences between infectious agents and human host can be exploited for chemotherapy
4. Explain the observed effect of a particular environmental change on the growth of a given microorganism, and the relationship between bacterial growth patterns and selected foodborne illnesses
5. Describe several mechanisms by which pathogens generate genetic diversity and the role genetic diversity plays in resistance to therapy and treatment failure
6. Explain the role of innate, and adaptive immunity in host defense
7. Describe general virulence strategies used by variety of pathogens, and different types of vaccines along with recommendations for vaccinations of specific populations
8. Demonstrate understanding of signs and symptoms of selected diseases, and be able to relate disease agents with environmental reservoirs and transmission

BIOL 2505. Pathophysiology**3 Credits (3)**

This course is designed to provide the conscientious student with a solid foundation for understanding the pathophysiological processes of the human organism. Successful completion of this course will promote the general student learning outcomes listed below. Corequisite/Prerequisites(s): AHS 154 or BIOL 2225. Restricted to: Community Colleges only.

Prerequisite(s): AHS 153 or BIOL 2210.

Learning Outcomes

1. To describe the general concepts of disease processes and factors associated with disease causation.
2. To identify the function of basic cellular structures, determining the process of cellular malfunctions.
3. To describe the response of the body to injury and immunologic challenge.
4. To discuss the etiology, pathogenesis, and treatment modalities of frequently occurring diseases.

BIOL 2511. Human Pathophysiology**3 Credits (3)**

The first in a two-course sequence that covers changes in body physiology that result from disease or injury. Includes a general introduction to pathophysiology as well as an overview of altered cellular and tissue biology, injury, inflammation, and neoplasia. Students will also explore deviation from fluid, hemodynamic, and endocrinologic balance. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of C- or higher in BIOL 2210 and BIOL 2225.

Learning Outcomes

1. The cellular adaptations occurring in atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia; the types and causes of cellular injury; and the types of necrosis.
2. The different compartments for body fluids; the factors that affect water movement; the processes that drive and affect capillary exchange; the mechanisms causing edema; the electrolytes in body compartments; the various electrolyte imbalances; the body mechanisms that maintain acid-base balance; and the various acid-base imbalances and how they are compensated for .
3. The interrelationships of DNA, RNA, and proteins; the various types of mutations; the various types of mutagens, the various types of numerical and structural chromosomal aberrations; the various genetic terms; the single-gene disorders discussed in class; the multifactorial disorders discussed in class.
4. The relationships between genes, environment, and multifactorial diseases; the criteria used to define multifactorial disease; the characteristics of multifactorial traits; and the various features of the threshold model.
5. The terms related to tumor/cancer biology, classification, and nomenclature; the various features of cancer biology, including the characteristics of cancer and the genetic basis of cancer; features related to cancer invasion and metastasis; and the clinical manifestations and treatments of cancer.
6. Features related to Innate and adaptive immunity; features related to the first, second, and third lines of defense; the mechanisms and manifestations of inflammation; components/mechanisms related to the complement, clotting, and kinin systems; mechanisms of wound healing; and features of dysfunctional wound healing.
7. Aspects/mechanisms of specific (adaptive) immunity, features related to the structure, function, and classification of immunoglobulins; features related to haptens, antigens, immunogens, and epitopes; the different types of antigens; features related to immunological memory; and features related to the different types of active and passive immunity.
8. Aspects related to allergy, autoimmunity, and alloimmunity; aspects/mechanisms/examples related to the four basic types of hypersensitivity reactions; mechanisms and examples related to autoimmunity; and aspects/mechanisms related to immunodeficiency.
9. The risk factors for infection; the six components of the chain of infection; general concepts, terms, and processes/mechanisms related to basic microbiology; and the mechanisms of microbial pathogenicity. 1
10. General concepts, terms, and processes/mechanisms related to normal hormonal action; mechanisms of hormonal alterations; processes/mechanisms related to the pathophysiology of the various disorders discussed in class; and the clinical manifestations and treatment of the hormonal alterations discussed in class.

BIOL 2512. Human Pathophysiology II
3 Credits (3)

The second in a two-course sequence that covers changes in body physiology that result from disease or injury. This course focuses on the pathophysiology of the nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.

Prerequisite: Grade of C- or higher in BIOL 2210, BIOL 2225, and BIOL 2511.

Learning Outcomes

1. The different types of sensory modalities; the different dysfunctions of the general and special senses; the different pain theories discussed in class; the various aspects of the neuroanatomy and neuromodulation of pain; the various clinical descriptions of pain; the various aspects of temperature regulation; components of the pathogenesis of fever; the various disorders of temperature regulation; the various aspects of sleep disorders; the various components of visual dysfunction; and the various aspects of auditory, gustatory, and olfactory dysfunction.
2. The various alterations in cognitive systems; the various alterations in arousal; the outcomes of alterations in arousal; the various alterations in awareness; the various seizure disorders; the various data processing deficits; various alterations in cerebral hemodynamics; and alterations in neuromotor function.
3. The various disorders of the central and peripheral nervous systems; and the various disorders of the neuromuscular junction.
4. The components of normal blood; the process/stages of hematopoiesis; the various normal RBC laboratory values; the components and functions of the lymphatic system; the various types of imbalances of erythropoiesis; the various types of anemias and their causes; the various types of polycythemia and their causes; the processes related to hemostasis; the various alterations of white blood cells and their causes; and the various alterations of lymphoid and hemostatic function.
5. The various diseases of the veins; the various diseases of the arteries; the various aspects of atherosclerosis; features related to the pathogenesis and consequences of coronary artery disease; the disorders of the heart wall and their consequences; the various aspects of valvular dysfunction; aspects of the pathogenesis and manifestations of rheumatic disease; the causes, pathogenesis, and manifestations of infective endocarditis; the causes, manifestations, and pathophysiology of heart failure; and the various types of shock.
6. The various signs and symptoms of pulmonary disease; the various conditions caused by pulmonary disease/injury; the various disorders of the chest wall and pleura; and the causes, manifestations, and pathophysiology of selected pulmonary disorders.
7. The features and consequences of upper and lower urinary tract obstruction; the various types of urinary tract infection; the causes, pathogenesis, and clinical manifestations of glomerulonephritis; the various features of nephrotic and nephritic syndrome; and the various features (etiology, pathophysiology, and clinical manifestations) of both acute kidney injury and chronic kidney disease.
8. The various clinical manifestations of gastrointestinal dysfunction; the various aspects (etiology, pathophysiology, and clinical manifestations) of disorders of motility; the causes, manifestations, and pathophysiology of gastritis; features related to the causes, manifestations, and pathophysiology of peptic ulcer disease; features related to the etiology, pathogenesis and pathophysiology of selected malabsorption syndromes, inflammatory bowel diseases, diverticular disease of the colon, appendicitis, and irritable bowel syndrome; the various features of functional GI disorders; the various features of

BIOL 2610G. Principles of Biology: Biodiversity, Ecology, and Evolution
3 Credits (3)

This course is an introduction to the dynamic processes of living things. Major topics include the mechanisms of evolution, biological diversity, Mendelian genetics, and ecology.

Prerequisite/Corequisite: grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.

Learning Outcomes

1. Understand the scientific method and apply it to biological topics of genetics, evolution, ecology, and biodiversity.
2. Apply quantitative reasoning and scientific thinking to real world problems.
3. Identify and describe the basic principles of evolution.
4. Analyze the relationships between the genetics of populations and evolution.
5. Analyze the processes of speciation.
6. Describe how the hierarchical classification scheme is used to categorize organisms.
7. Describe how DNA research has modernized bio systematics.
8. Compare and contrast the general characteristics of each of the living domains and kingdoms.
9. Relate the structure of organisms to the way they function. 1
10. Explain how the life histories of organisms are adapted for different environments. 1
11. Relate the complexity of behavior to the overall complexity of an organism. 1
12. Describe the ecological roles played by organisms in each kingdom. 1
13. Compare basic ecological principles at the population and community levels of organization. 1
14. Describe and compare energy relationships and the cycling of materials in ecosystems. 1
15. Identify and describe the basic principles of Mendelian genetics.

BIOL 2610L. Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
1 Credit (3P)

This laboratory course is an introduction to the dynamic processes of living things. This course introduces students to the methods used in the study of Mendelian genetics, evolution, ecology, and biological diversity. Designed for students continuing in life sciences.

Prerequisite/Corequisite: BIOL 2610G; grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.

Learning Outcomes

1. Describe and apply the scientific method to generate testable hypotheses in evolution and ecology.
2. Design and conduct laboratory experiments using relevant laboratory equipment and methods.
3. Analyze and report data generated during laboratory activities and experiments.
4. Communicate scientific results from experiments in Mendelian genetics, evolution, ecology, and biodiversity.

BIOL 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits. Community Colleges only.

Learning Outcomes

1. Varies

BIOL 301. Principles of Ecology**3 Credits (3)**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. MATH 1511G and A ST 311 recommended. Same as ENVS 301. Crosslisted with: ENVS 301.

Prerequisite(s): BIOL 2610G, MATH 1220G.

BIOL 302. Molecular Biology Techniques Laboratory**3 Credits (6P)**

This combined lecture and laboratory course emphasizes molecular biology laboratory practices through the hands-on application of commonly applied techniques, protocols, and equipment. The topics covered include both the fundamental development of empirical data as well as data analysis using stand-alone and web-based resources. Consent of instructor required.

Prerequisite(s): BIOL 2110G or equivalent, and MATH 1220G.

BIOL 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

BIOL 309. Guided Biological Research Lab**3 Credits (3)**

This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career undergraduates who have finished the introductory sequence of Biology courses. Topics will vary with instructor.

Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 311. General Microbiology**3 Credits (3)**

Principles of physiology, molecular biology, ecology, and taxonomy of microorganisms.

Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 311 L. General Microbiology Laboratory**2 Credits (4P)**

Microbiology techniques and procedures, including isolation and identification of microorganisms and biotechnology procedures that employ microorganisms.

Prerequisite(s)/Corequisite(s): BIOL 2320 or BIOL 311. **Prerequisite(s):** BIOL 2110G and MATH 1220G.

BIOL 312. Plant Taxonomy**3 Credits (2+3P)**

Classification and identification of representative plant families and local plants. Emphasis on ability to use technical sources. Saturday field trips may be recommended.

Prerequisite(s): BIOL 2610G and MATH 1220G.

BIOL 313. Structure and Function of Plants**3 Credits (2+3P)**

Structure, function, and survey of plants. BIOL 2110G recommended.

Prerequisite(s): BIOL 2610G, MATH 1220G, and sophomore-level standing.

BIOL 314. Plant Physiology**3 Credits (3)**

Photosynthesis, respiration, water relation of plants, minerals and organic nutrition, growth and development.

Prerequisite(s): BIOL 2110G and CHEM 1225G.

BIOL 322. Zoology**3 Credits (2+3P)**

Structure, function, and survey of animals. BIOL 2110G recommended.

Prerequisite(s): BIOL 2610G, MATH 1220G, and at least sophomore-level standing.

BIOL 350. Special Topics**1-4 Credits**

Specific subjects announced in Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 351. Biology Internship**1-6 Credits**

Substantial off-campus experience in biology selected by student in consultation with regular biology faculty member. Internship must be approved by faculty member. Student will supply mutually agreed upon documentation of internship activities after the internship is completed. May be repeated up to 6 credits. Restricted to: BIOL, MBIO, CEC, GEBT majors. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): 45 college credits, 2.5 or better GPA, consent of instructor.

BIOL 353. Pre-Professional Human Anatomy**4 Credits (4)**

Pre-professional clinically-oriented survey of human anatomy. Designed primarily for pre-nursing majors. Provides comprehensive anatomical training for students planning careers in health and allied health sciences, such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. Suitable as a biology elective.

Concurrent enrollment in BIOL 353 L is recommended but not required. May be repeated up to 4 credits.

Prerequisite(s): BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 353 L. Pre-Professional Human Anatomy Laboratory**1 Credit (3P)**

Laboratory experience in human anatomy using anatomical models and cat dissections. Designed as a learning aid to support and augment BIOL 353 pre-professional Human Anatomy. For students planning careers in health and allied health sciences such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. May be repeated up to 1 credits.

Prerequisite(s)/Corequisite(s): BIOL 353. **Prerequisite(s):** BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 354. Physiology of Humans**3 Credits (3)**

Principles of integrative functions in humans. A systems approach emphasizing tissues, organs, and their regulation.

Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 354 L. Laboratory of Human Physiology**1 Credit (3P)**

Laboratory to accompany BIOL 354.

Prerequisite(s): MATH 1220G and either BIOL 2221, BIOL 381, BIOL 354, or concurrent enrollment in BIOL 354.

BIOL 373. Fungal Biology**3 Credits (3+2P)**

Same as EPWS 372.

Prerequisite: EPWS 310 or BIOL 311 or consent of instructor.

BIOL 377. Cell Biology**3 Credits (3)**

Fundamentals of eukaryotic cell structure, organization, and function. Emphasis on membranes, subcellular organelle systems, cytoskeleton, and cell cycle. Includes basic aspects of molecular biology. May be repeated up to 3 credits. BIOL 2610G recommended.

Prerequisite(s): (BIOL 2110G, BIOL 305 or GENE 315) and MATH 1220G.

BIOL 381. Animal Physiology**3 Credits (3)**

Principles of integrative function in animals, emphasizing tissues, organs, organ systems, and regulation. Includes adaptations of animals to their environments. BIOL 2610G and BIOL 377 recommended.

Prerequisite(s): BIOL 2110G and junior-level standing, MATH 1220G.

BIOL 382. Plant Signalling and Development**3 Credits (3)**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 385. An Introduction to Cancer**3 Credits (3)**

This course will cover 3 areas of cancer research and their interdisciplinary connections: clinical cancer research, epidemiology and public health, and basic cancer research. May be repeated up to 3 credits.

Prerequisite(s): BIOL 305 or GENE 315 or equivalent and MATH 1220G.

BIOL 398. Biology Research Programs**1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 402. Biology Honors Thesis**1-3 Credits (1-3)**

Provides guidance in how to write a scientific paper in the sciences. Students will produce an honors thesis based on previous independent research. Consent of instructor required.

Prerequisite(s): MATH 1220G and consent of instructor.

BIOL 412. Seminar in Microbiology**1 Credit (1)**

Seminar to aid students in assessment and presentation of current topics in microbiology.

Prerequisite(s): BIOL 311, BIOL 311 L, and MATH 1220G.

BIOL 417. Topics in Environmental Microbiology**3 Credits (3)**

This is an advanced undergraduate course based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA, and the human microbiome. Crosslisted with: BIOL 577.

Prerequisite(s): MATH 1220G, BIOL 477 or consent of instructor.

BIOL 424. Human Osteology**3 Credits (3)**

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Students are recommended to take ANTH 355 or an equivalent before enrolling in this course. BIOL 424L should be taken concurrently when it is offered. Crosslisted with: ANTH 474.

BIOL 427. Symbiosis**3 Credits (3)**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 527.

Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 436. Disease Vector Biology**3 Credits (3)**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Crosslisted with: BIOL 536

Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 442. Genomics Technology**3 Credits (3)**

The course introduces current genomic techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Crosslisted with: BIOL 562.

Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 446. Bioinformatics and NCBI Database**3 Credits (3)**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study.

Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 450. Special Topics**1-3 Credits**

Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 451. Physiology of Microorganisms**3 Credits (3)**

Aspects of cellular physiology unique to prokaryotes. BCHE 395 recommended.

Prerequisite(s): C- or better in BIOL 311, MATH 1220G.

BIOL 455. Biometry**3 Credits (3)**

Biometry is the analysis of biological data using mathematical and statistical models. The course will cover basic theories of probability and statistics and will introduce principles of sampling, estimation, experimental design, and hypothesis testing. Students will analyze biological data using computer programs and will perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.

Prerequisite(s): BIOL 2310G or BIOL 2110G, and MATH 1220G.

BIOL 459. Darwinism Versus Creationism**3 Credits (3)**

This course examines the debate regarding Creationism versus Darwinism as explanations for the origin and diversification of life on Earth. Topics covered include the nature and philosophy of science, new-world creationism, old-world creationism, intelligent design, history of evolutionary thought, modern evolutionary theory, and the Creationism-Darwinism debate at the societal, political, and educational interfaces. The course structure will include formal lectures and in-class discussion of assigned readings.

Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 459 H. Darwinism versus Creationism Honors**3 Credits (3)**

This course will examine the history and philosophy surrounding the debate between Darwinism and Creationism. The course will also examine the consequences of the debate at the interface of sociology, economics, politics, and education. The Honors version of the course (BIOL 459H) will require a term paper in addition to the requirements of BIOL 459. Crosslisted with: BIOL 459.

Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 462. Conservation Biology**3 Credits (3)**

Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally.

Prerequisite(s): BIOL 301 and either MATH 1430G or MATH 1511G.

BIOL 465. Invertebrate Zoology**4 Credits (3+3P)**

Survey, ecology, behavior and physiology. BIOL 322 recommended.

Prerequisite(s): MATH 1220G, BIOL 2610G, and junior-level standing.

BIOL 466. Invertebrate Zoology Field Trip**1 Credit (1)**

A one-week field trip for the study of marine invertebrates. Registrants must provide own camping gear. Graded: S/U.

Prerequisite(s): MATH 1220G, BIOL 465 or equivalent (or concurrent enrollment) or consent of instructor.

BIOL 467. Evolution**3 Credits (3)**

Covers theory, historical background, population variation, natural selection, adaptation, speciation.

Prerequisite(s): BIOL 2610G, BIOL 305 or GENE 320, and MATH 1220G.

BIOL 469. Biology of Emerging Infectious Diseases**3 Credits (3)**

This class will investigate the evolutionary and ecological drivers of disease emergence. The effect of emerging diseases on human health will be addressed throughout the class, but the class will also consider the consequences of disease emergence for the health of wildlife and plant populations. Additionally, the class will consider the mechanisms used to control disease emergence and why they succeed or fail.

Prerequisite(s): MATH 1220G, Introductory Genetics (BIOL 305 or equivalent) or consent of the instructor.

BIOL 470. Developmental Biology**3 Credits (3)**

The purpose of this course is to introduce students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and, how changes in development provide the material basis for evolutionary change.

Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 472. Primate Behavior and Ecology**3 Credits (3)**

Survey of the social behavior and ecology of nonhuman primates. Crosslisted with: ANTH 472.

BIOL 473. Ecology of Microorganisms**3 Credits (2+3P)**

The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes.

Prerequisite(s): MATH 1220G, BIOL 311 or consent of instructor.

BIOL 474. Immunology**3 Credits (3)**

Basic concepts of the immune response.

Prerequisite(s): MATH 1220G, BIOL 305, and CHEM 2115 or CHEM 313.

BIOL 475. Virology**3 Credits (3)**

Mechanisms of viral infections of animals and man. BCHE 395 or BIOL 305 are recommended.

Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 476. Soil Microbiology**3 Credits (3)**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land framing, bioremediation, and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as SOIL 476.

BIOL 476 L. Soil Microbiology Laboratory**1 Credit (3P)**

Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as SOIL 476L.

Prerequisite(s)/Corequisite(s): BIOL 476.

BIOL 477. Applied and Environmental Microbiology**4 Credits (4)**

A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology.

Prerequisite(s): MATH 1220G, BIOL 311, and 311 L, or consent of instructor.

BIOL 478. Molecular Biology of Microorganisms**3 Credits (3)**

The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. BIOL 305 and BCHE 395 recommended.

Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 479. Medical Microbiology**3 Credits (3)**

An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease.

Prerequisite(s): MATH 1220G and BIOL 311 required, BIOL 474 recommended.

BIOL 479 L. Medical Microbiology Laboratory**1 Credit (1)**

Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. May be repeated up to 1 credits.

Prerequisite(s)/Corequisite(s): BIOL 479. **Prerequisite(s):** MATH 1220G, BIOL 311, BIOL 311 L.

BIOL 480. Animal Behavior**3 Credits (3)**

A survey of the field of animal behavior. BIOL 322 recommended.

Prerequisite(s): MATH 1220G, BIOL 2610G, and junior-level standing.

BIOL 484. Animal Communication**3 Credits (3+3P)**

An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products. May be repeated up to 3 credits.

Prerequisite: BIOL 2610G or consent of instructor, and MATH 1220G or higher.

Learning Outcomes

1. Describe how animal signals are produced, transmitted, and received in various taxa,
2. Understand how evolutionary, ecological and economic principles help predict how animals will communicate,
3. Describe general patterns of animal communication across a range of social contexts.

BIOL 488. Principles of Conservation Genetics**3 Credits (3)**

Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations.

Prerequisite(s): MATH 1220G and BIOL 305.

BIOL 489. Genetic Aspects of Population Biology**3 Credits (3)**

Basic theory of population genetics and how that theory has guided, and been influenced by, studies of natural populations.

Prerequisite(s): MATH 1220G and BIOL 305 or equivalent.

BIOL 490. Neurobiology**3 Credits (3)**

Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems.

Prerequisite(s): BIOL 2110G, MATH 1430G or equivalent.

BIOL 498. Biology Research Programs**1-3 Credits**

Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 509. Guided Biological Research Lab**3 Credits (3P)**

This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career graduate students wishing an introduction to research practices. Topics will vary with instructor. Crosslisted with: BIOL 309.

BIOL 510. Current Topics in Biology**3 Credits (3)**

Introduction to diverse topics in modern biology, including dynamic areas of current research.

BIOL 514. Plant Physiology**3 Credits (3)**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. May be repeated up to 2 credits.

Prerequisite: BIOL 2110G and CHEM 1225G.

Learning Outcomes

1. Describe how individual plants survive in variable environments.
This means that students will be able to: a. Summarize the chemical and physical bases for major plant processes. b. Explain how major plant processes interact to support plant growth and development. c. Describe the adaptive forms of physiological processes and their underlying anatomical modifications.
2. Predict consequences of environmental change on physiological processes within individual plants.
3. Apply course concepts to real-world scenarios that involve plant function and plant development.
4. Describe experimental approaches used to understand physiological processes within individual plants.

BIOL 520. Molecular Cell Biology**3 Credits (3)**

An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature.

Prerequisite: BIOL 377 or equivalent.

BIOL 527. Symbiosis**3 Credits (3)**

In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 427.

Prerequisite(s): Graduate status.

BIOL 536. Advanced Disease Vector Biology**3 Credits (3)**

Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Taught with: BIOL 436.

Prerequisite(s): BIOL 2110G and BIOL 305.

BIOL 540. Science and Ethics**1-3 Credits (1-3)**

Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated up to 4 credits. Crosslisted with: PHIL 540.

BIOL 541. Professional Development Seminar**1-3 Credits**

Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc.

Prerequisite: consent of instructor.

BIOL 550. Special Topics**1-3 Credits**

Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic entomology, or parasitism in animals. May be repeated for unlimited credit.

Prerequisite: consent of instructor, and designation of a specific topic before registration.

BIOL 562. Advanced Genomics Technology**3 Credits (3)**

This course covers current genomics techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: BIOL 442.

BIOL 565. Biology In The K-6 Curriculum**3 Credits (3)**

Linking important biological concepts to the K-6 curriculum and standards. Addressing known content area challenges with effective pedagogical approaches. Aligning content, standards, classroom activities and assessment. Does not fulfill requirements for degrees in biology. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability) 1
11. Describe the benefits of a case study approach to teaching 1
12. Align biology content with specific K-6 (e.g. NGSS) science standards 1
13. Design an instructional case study (complete with teaching notes and assessment) to address specific K-6 science standards

BIOL 566. Advanced Bioinformatics and NCBI Database**3 Credits (3)**

The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study. Consent of Instructor required.

BIOL 568. Communities and Ecosystems**3 Credits (3)**

Community ecology is an interdisciplinary field that integrates numerous theories, concepts, and methods to study the patterns and dynamics of biotic assemblages. Because biotic groups affect the biogeophysical and biogeochemical processes that govern Earth system functioning, community ecology also plays an increasingly large role in the study of ecosystem ecology, a discipline which seeks to understand the processes governing nutrient and energy flow across the Earth system. This course will explore the theories and methods for study of biodiversity, biogeography, and community assembly, as well as the pathways through which communities exert influence on ecosystem functioning. Topics will also include evolutionary influences on communities, the integration of community ecology into conservation and land management, and community ecology in an era of rapid environmental change.

BIOL 572. Advanced Primate Behavior and Ecology**3 Credits (3)**

Advanced review of non-human primate social behavior and ecology. Crosslisted with: ANTH 572.

BIOL 577. Advanced Topics in Environmental Microbiology**3 Credits (3)**

This course is based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA and the human microbiome.

Prerequisite(s): Consent of instructor.

BIOL 581. Physiology of Animals**3 Credits (3)**

Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. BIOL 2610G, BIOL 377 recommended.

Prerequisite: BIOL 2110G.

BIOL 582. Advanced Plant Signalling and Development**3 Credits (3)**

This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.

Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 587. Behavioral and Evolutionary Ecology**3 Credits (3)**

This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.

BIOL 589. Speciation and Adaptation**1-3 Credits (1-3)**

Examination of the two great themes of evolutionary biology. Begins with an historical overview of perspectives on these evolutionary processes, and then moves through the foundations of modern research to focus on recent advances driven by improvements in theory and technology. Emphasis on synthesis of the primary literature through lectures, discussion, and written assignments.

Learning Outcomes

1. Students will actively participate in discussions focused on both classic foundational texts as well as recent research in this field.
2. Students are expected to lead class discussions on relevant evolution topics.
3. Students will learn to write a literature review paper on a specific topic in the field of evolutionary biology.

BIOL 590. Neuroscience**1-3 Credits**

Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. May be repeated up to 9 credits.

BIOL 598. Special Research Programs**1-9 Credits**

Individual investigations either analytical or experimental.

BIOL 599. Master's Thesis**15 Credits**

Thesis.

BIOL 600. Doctoral Research**1-15 Credits**

Research.

BIOL 610. Seminar**1-3 Credits (1-3)**

Oral presentation and discussion of journal articles and ongoing research projects. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

BIOL 612. Microbiology Seminar**1 Credit (1)**

Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.

BIOL 697. University Teaching Experience**1-3 Credits**

Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

BIOL 698. Selected Topics**1-3 Credits**

Selected topics for doctoral students.

BIOL 700. Doctoral Dissertation**15 Credits**

Dissertation.

BLAW-BUSINESS LAW

BLAW 2110. Business Law I**3 Credits (3)**

Survey of the legal environment of business and common legal principles including: the sources of law, dispute resolution and the U.S. court systems, administrative law, tort law, contract law, agency and employment law, business structure and governance, ethics and corporate social responsibility. Explores sources of liability and presents strategies to minimize legal risk. Offered at all NMSU Community Colleges except Dona Ana Community College. Credit may not be earned in both BLAW 2110 and BLAW 317.

Learning Outcomes

1. Describe the sources of law.
2. Describe and explain dispute resolution and the court systems in the United States.
3. Describe the concepts of negligence, intentional torts and strict liability.
4. Describe and apply the essential aspects of contracts from creation, performance, breach and remedies, including basic contract law from Article 2 of the Uniform Commercial Code.
5. Explain the concept of ethics.

BLAW 313. Sports and the Law**3 Credits (3)**

Introduction to legal concepts related to sports and business including an introduction to U. S. law and the civil practice, agency, sports contracts, sport torts, sport crimes, pertinent federal legislation such as Title IX, drugs and sports, international sports issues, pertinent antitrust issues, intellectual property, ethics and alternative dispute resolution.

Prerequisite(s)/Corequisite(s): BLAW 316.

BLAW 316. Legal Environment of Business**3 Credits (3)**

Survey of business law including: the legal system (court systems, sources and types of law, litigation and dispute resolution), ethics and corporate social responsibility, administrative law, tort law, contract law, agency and employment law, business structure and governance, securities regulations, and international law. Students may not receive credit for both BLAW 316 and BLAW 317.

BLAW 325. Real Estate Principles and Law I**3 Credits (3)**

Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BFIN 325.

BLAW 330. Entrepreneurial Law**3 Credits (3)**

This course will explore the legal issues faced in the process of launching, financing, and growing a new venture. We will pay special attention to ventures making use of innovative technologies and business models. Intellectual property (trade secrets and confidential information, patents, copyrights, and trademarks) are of special importance to innovation-driven ventures, so we will consider in-depth how intellectual property is developed, protected, and put to use.

BLAW 385V. Employment and Consumer Law**3 Credits (3)**

Study of the interrelationships between business, legal, and ethical aspects of employment and consumer issues and their attendant civil liability and remedies in domestic and international markets.

Learning Outcomes

1. Almost every aspect of today's businesses is subject to a myriad of legal requirements imposed by law (whether that law be civil or criminal, common or statutory, or regulatory). Legal issues lurk everywhere! To succeed in business, one must be aware of the major aspects of the substantive law and the nature of the legal system, and be able to communicate with the lawyers that he or she will likely come in contact with.
2. Successful completion of this course will not qualify you to be a lawyer or to solve your own legal problems (or those of your business). Rather, this course will provide you with a broad overview of certain aspects of the law that you may encounter in your day-to-day business (or personal) affairs (some of the subjects covered in a chapter in this course are semester-long courses in law school, so this course necessarily is somewhat of a "survey" of the topics covered).
3. Successful completion of the course should provide you with sufficient knowledge to recognize when "legal" issues in consumer protection are looming, and provide you some tools to assist you in seeking the right help to address the issues. Students taking this course will better understand the American legal system, with an emphasis on administrative law, since most consumer protection regulations are a creature of administrative law.
4. Secondly, students will master the scope of several consumer protection agencies, their respective roles and responsibilities, and the associated obligations of businesses and consumers to comply with the various agency rules and regulations.
5. Third and finally, interspersed throughout the semester student will learn about select topics they choose that have some relationship to consumer protection. This is student guided, and can be anything of interest to you. In the past, I have covered landlord-tenant law, intellectual property, state lemon laws, election law, and employment law.

BLAW 490. Selected Topics**1-3 Credits**

Prerequisites vary according to the seminar being offered.

BLAW 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head.

Prerequisites: junior or above standing and consent of instructor and department head.

BLAW 502. Legal Environment of Business**3 Credits (3)**

Legal procedures and the judicial system as applied to business situations and a general coverage of the bodies of substantive law most commonly associated with business.

Prerequisite: graduate students only.

BLAW 518. Uniform Commerical Code and Advanced Business Law Topics**3 Credits (3)**

Property, advanced contract law, debtor-creditor relations, bankruptcy and Uniform Commercial Code topics, including sales, negotiable instruments, secured transactions. Students who have taken either BLAW 318 or BLAW 418 may not receive credit for BLAW 518. Same as BLAW 418 with differentiated assignments for graduate students.

Prerequisite(s): BLAW 316 or BLAW 502.

BLAW 527. Negotiation and Business Dispute Resolution**3 Credits (3)**

Focus on learning tactics related to conflict resolution skills and negotiation theory. Also the use of quantitative methods and their realistic application in resolving disputes. Students will participate in numerous role playing activities and simulated mediation games. Same as MGMT 527.

BLAW 550. Selected Topics**3 Credits (3)**

Seminars in selected topics related to business law or the legal environment of business.

Prerequisite(s): Varies according to seminar being offered.

BLAW 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental with the prior consent of the instructor and department head.

Prerequisite: consent of instructor and department head.

BLED-BILINGUAL EDUCATION

BLED 1110. Introduction n Bilingual Education/ESL**3 Credits**

An overview of the American Education system with emphasis on organization, governance, law, demographics, and professional practice. Will include supervised experience in bilingual education/ESL elementary settings for prospective bilingual education/ESL teachers.

Learning Outcomes

1. Complete 24 hours field observations in a classroom.
2. Articulate the attributes of an education professional entering the field.
3. Construct an individualized map to teacher licensure in the State of New Mexico.
4. Differentiate and summarize the major educational philosophies and historical events that have influenced the progression of educational practice.

BLED 2110. Bilingual Methods**3 Credits (3)**

This course provides a historical overview of bilingual and ESL education including an emphasis on present trends and practices. Discussions of the aspects of bilingualism at both an individual and a societal level are included. May be repeated up to 3 credits.

Learning Outcomes

1. (Culture) Develops awareness in the learner of the value of cultural diversity.
2. (Culture) Prepares and assists students to interact successfully in cross cultural settings.
3. (Culture) Recognizes and accepts different patterns of child development within and between cultures in order to formulate realistic instructional strategies.
4. (Culture) Recognizes the similarities and differences between mainstream American and other cultures and the potential conflicts and opportunities they may create for students.
5. (Culture) Demonstrates knowledge of the effects of culture and socio-economic variables in learning styles.
6. (English Language Development) Demonstrates knowledge of the basic nature of language, language acquisition, language variation, language change, and the relation of language to society and culture.
7. (English Language Development) Demonstrates knowledge of the nature of bilingualism and the process of becoming bilingual.
8. (Instructional Methodology) Demonstrates knowledge of the historical, legal, theoretical, and sociological foundations of programs of instruction for second language learners.
9. (Instructional Methodology) Demonstrates knowledge of theories of first and second language acquisition. 1
10. (Instructional Methodology) Utilizes teaching methods appropriate to various age and language groups.

BLLED 3110. Secondary Bilingual/ESL Field Experience**3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Taught with EDUC 3997. May be repeated up to 3 credits.

Learning Outcomes

1. Complete thirty-two hours of secondary classroom and professional development practicum with a satisfactory rating from middle/high school cooperating teacher.
2. Apply Costa's Level of Thinking, WICOR strategies, Cornell Notes, and other high-yield strategies of the AVID College Readiness System.
3. Interact with youth through a tutoring model.
4. Demonstrate ability to effectively utilize specific observation techniques in secondary classrooms following specific guidelines.
5. Describe classroom language and culture of middle/high school.
6. Develop an understanding of resources available at the secondary level.
7. Identify authentic assessment and instructional methods that can be used to deliver engaging lessons in specific content areas.
8. Participate in a weekly discussion seminar.
9. Assemble a culminating reflective portfolio that demonstrates the ability to self-assess strength and need areas based on NM Teach InTASC standards and experiences in the classroom/professional development.

BLLED 3120. Sheltered English Instruction for the ESL Classroom**3 Credits (3)**

Addresses the acquisition of English proficiency by speakers of other languages. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss sheltered instruction for teaching English learners (ELs).
2. Compare and contrast SIOP model lesson components and features.
3. Co-Design a grade-level and subject-specific SIOP lesson with a peer.
4. Correlate components of your prepared lesson plan to ensure alignment.
5. Co-Implement your SIOP lesson in class.
6. Evaluate two lessons (yours and another lesson developed by two other peers).

BLLED 3130. Language, Literacy, and Culture in the ESL Classrooms**3 Credits (3)**

Framework and strategies for developing the written abilities of second language learners. May be repeated up to 3 credits.

Learning Outcomes

1. Build an online learning community.
2. Demonstrate an understanding of various perspective and theories on language, culture, and literacy.
3. Demonstrate an understanding of the impact that federal and state language/literacy policies have had on schools.
4. Evaluate the major arguments articulated and varying positions taken about language, literacy, and culture by scholars from different disciplines, such as Sociolinguistic, Linguistics, Sociology, Cultural studies.
5. Analyze social, political, and ideological aspects/components of these concepts, perspectives, and theories.
6. Explain the interaction between literacy, language, culture, and its implication for student learning.
7. Apply the theories of language, culture, and literacy they are learning in classroom practices.
8. Demonstrate critical thinking skill

BLLED 3140. Issues in Schooling for Bilingual Learners**3 Credits (3)**

Current thought and direction regarding bilingual education in the United States and New Mexico. May be repeated up to 3 credits.

Learning Outcomes

1. To create a framework for understanding issues facing bilingual learners with scrutiny toward socialjustice.
2. To review and study the various theories that informs bilingual education.
3. To explore the classroom practice of these theories with bilingual learners.
4. To co-construct practical teaching strategies to use with bilingual learners.
5. To reflect on the socio/politico-cultural constructs and contexts of bilingual learners

BLLED 4110. Second Language Acquisition**3 Credits (3)**

Exploring affective, cultural, linguistic, cognitive factors that influence the second language acquisition process with application to classroom practice. Restricted to: TEP, EED, ECED, SED and SPED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Explore different language perspectives as they relate to first and second language acquisition
2. Explore the role of language across different social contexts and academic contexts
3. Explore the cognitive factors influencing language development in second language learning and acquisition
4. Examine culturally linguistically diverse styles of second language learners and how these factors influence the second language acquisition process
5. Explore, select and implement second language teaching methods

BLED 4996. Special Topics**3 Credits (3)**

Course subtitled in the Schedule of Classes. May be repeated up to 9 credits.

Learning Outcomes

1. Examine specific topics selected by the instructor in the field of bilingual education.

BLED 5110. Adult and Family Literacy in TESOL**3 Credits (3)**

An exploration of the theoretical, programmatic, and curricular frameworks for English language learners and their families. Focus on the development of culturally responsive and pedagogically sound literacy programs. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the assumptions underlying the common practices of family and adult education that predominate in schools and in public discourse.
2. Plan and conduct an adult and family literacy project by expanding the range of family literacies to include those practiced in non-mainstream cultural groups, as well as to include those literacies that are necessary in order to be able to participate fully in building a democratic society.
3. Develop research questions, collect data from the adult and family literacy sessions, and write a Family Literacy Research Project.
4. Develop an advocacy plan for policy makers and administrators based on your work with adults and families.

BLED 5120. The Bilingual Preschool Child**3 Credits (3)**

Principles of multicultural education applied to preschool and primary levels. Focus on issues, methods, and materials. May be repeated up to 3 credits.

Learning Outcomes

1. Compare and contrast bilingual -bicultural early childhood curriculum models.
2. Address early literacy and language development in children's first and second languages.
3. Demonstrate strategies for cross-cultural competence when working with families and communities.
4. Respond to the linguistic and cultural backgrounds of children.
5. Use the cultural arts in curriculum planning and language development.
6. Apply theory and research in bilingual studies.

BLED 5130. Issues in Schooling for Bilingual Learners**3 Credits (3)**

Identification and consideration of current thought and directions in bilingual education, nationally and internationally. May be repeated up to 3 credits.

Learning Outcomes

1. To create a framework for understanding issues facing bilingual learners with scrutiny toward social justice.
2. To review and study the various theories that informs bilingual education
3. To explore the classroom practice of these theories with bilingual learners
4. To co-construct practical teaching strategies to use with bilingual learners
5. To reflect on the socio/politico-cultural constructs and contexts of bilingual learners

BLED 5210. Literacy-Language Instruction for Bilingual Students**3 Credits (3)**

Framework and strategies for developing the written language abilities of bilingual learners, with attention to the interrelationships among reading, writing, and oral language. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge about diverse theories on literacy, language, and culture and fully grasp the intersection between language, culture, and literacy and its implication for student learning.
2. Articulate an understanding of children's literacy and biliteracy development by examining the relationship between oral and written language.
3. Apply pedagogical knowledge about teaching and learning of reading/writing across different social contexts.
4. Develop an understanding of theoretical frameworks governing proficient reading and writing of all children, particularly bilingual learners.
5. Refine understanding of how children "come to know" literacy, bi-literacy, and critical literacy.
6. Implement best practices that organize, facilitate, mediate, and develop children's language, literacy, and content knowledge across the curriculum.
7. Demonstrate an understanding of how to organize teaching/learning for success in literacy and biliteracy across curricular content.

BLED 5220. Sheltered English Instruction for the ESL Classroom**3 Credits (3)**

Addresses the acquisition of English proficiency via the SIOP (Sheltered Instruction Observational Protocol) a research validated model for lesson planning and implementation that provides English learners with access to grade-level standards.

Learning Outcomes

1. Discuss sheltered instruction for teaching English learners (ELs).
2. Compare and contrast SIOP model lesson components and features.
3. Co-Design a grade-level and subject-specific SIOP lesson with a peer.
4. Correlate components of your prepared lesson plan to ensure alignment.
5. Co-Implement your SIOP lesson in class.
6. Evaluate two lessons (yours and another lesson developed by two other peers).

BLLED 5230. Language, Literacy and Culture in the ESL Classrooms
3 Credits (3)

Framework and strategies for developing the written abilities of second language learners. Explore different theories of language, culture and literacy by analyzing the interconnections between language, culture and literacy.

BLLED 5310. Bilingual/Multicultural Schooling and Community Relations
3 Credits (3)

Rationale, information pertinent to the school and the community in a setting involving economic, cultural, and linguistics diversity. May be repeated up to 3 credits.

Learning Outcomes

1. This course is designed as a space to enhance educators' understanding of bilingual/multicultural schooling and community relations in the borderland region as it relates to the rest of the US, with a view to rethinking their own role in order to become agents of change.
2. The main objective of this course is the development of a framework to understand, critique and contribute to the strengthening and critical transformation of school and community relations in the borderlands

BLLED 5320. Second Language Acquisition
3 Credits (3)

Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. May be repeated up to 3 credits.

Learning Outcomes

1. Explore different language perspectives as they relate to first second language acquisition
2. Explore the role of language across different social contexts and academic contexts
3. Explore the cognitive factors influencing language development in second language learning and acquisition
4. Examine culturally linguistically diverse styles of second language learners and how these factors influence the second language acquisition process
5. Explore, select and implement second language teaching methods.

BLLED 5330. Assessment in Culturally & Linguistically Responsive Teaching
1-3 Credits (1-3)

An overview of approaches to assessment with a special focus on cultural and linguistic responsiveness needed for teaching learners of English as an additional language.

Learning Outcomes

1. Explore different approaches to assessment in cultural and linguistically diverse (CLD) settings
2. Explore authentic assessment by content areas for assessing CLD students
3. Explore assessment of English language development in CLD students
4. Examine culturally linguistically diverse styles of CLD students
5. Select Culturally and Linguistically responsive assessments for assessing content and language in CLD students

BLLED 5410. Sociolinguistics in Education
3 Credits (3)

Course provides an overview of sociolinguistics, with emphasis on the study of the relationship between language and society. Explores both foundational and current issues as they relate to educational practice.

Learning Outcomes

1. The nature of reading and writing as socio-psycholinguistic processes including: Language, culture and politics and their relationships; The structure, forms and purposes of written language; What makes a text a text; Readers and writers as users of language. What that means; Written language in education and curriculum; Oral and written language development and their relationships; Alphabetic and non-alphabetic writing systems; Defining oneself as a literate person

BLLED 5420. Pedagogy of TESOL
3 Credits (3)

Overview of approaches that provide for interactive, culturally responsive pedagogy for students acquiring English. Emphasis on content and language integration through sheltered instruction. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and explore the foundations of TESOL instruction.
2. Analyze the sociocultural theory of teaching English as a second/ foreign language.
3. Demonstrate an understanding of culturally responsive pedagogy in language teaching and academic achievement.
4. Evaluate principles of best practices instruction and applications of TESOL methods.
5. Explore assessment issues and concepts related to English Language Learners.
6. Examine the impact of policies, national laws, school and community partnerships, and personal professional development on TESOL instruction.
7. Develop, select, and implement second language teaching methods.

BLLED 5990. TESOL Practicum
3 Credits (3)

Classroom applications of ESL literacy development through supervised teaching experiences accompanied by a seminar. May be repeated up to 3 credits.

Learning Outcomes

1. Apply philosophies of education related to curriculum issues in content and language ESL classroom settings
2. Apply knowledge of second language acquisition theory and methods in teaching ESL
3. Collaborate with peers in the design of age appropriate culturally and linguistically responsive lessons for English language learners
4. Reflect on teaching experiences making connections to theories, methods, assigned readings, and prior knowledge and experience
5. Authenticate a culturally and linguistically responsive pedagogy in practice

BLLED 5992. Directed Study in Bilingual Education
1-6 Credits (1-6)

Independent research topics in bilingual education based on particular individual interest or needs. May be repeated up to 88 credits.

Learning Outcomes

1. Analyze selected topics of interest in bilingual education selected by the student.

BLED 5996. Selected Topics in Bilingual Education**1-6 Credits (1-6)**

Various topics on current requests and needs in bilingual education. May be repeated up to 6 credits.

Learning Outcomes

1. Examine specific topics selected by the instructor in the field of bilingual education.

BLED 5998. Internship in Bilingual Education**1-6 Credits (1-6)**

Advanced experience in educational bilingual settings for prospective bilingual education teachers. May be repeated up to 6 credits.

Learning Outcomes

1. The Internship has traditionally meant that you will be involved in practicing what you have learned in a series of studies you have taken or are taking. In this course, we will cover topics and themes related to bilingual education

BLED 6110. Acquiring Emancipatory Discourses: TESOL/BIL**3 Credits (3)**

An elaboration of understandings of bi- and multilingualism and related models of education based on current research and practice. May be repeated up to 3 credits.

Learning Outcomes

1. This course is designed for participants to -deepen their critical understanding of the relationship between language and power and its relevance to educational studies -analyze critical discourses from different contexts, institutional settings, and social agents: major discourse theorists, educational researchers, teachers, and students -become familiar with Critical Discourse Analysis as a framework and a methodology to study the role of discourse in the construction of the social world and its relevance to teachers, students, and researchers in education

BLED 6120. Multiple Critical Literacies**3 Credits (3)**

An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels. Taught with READ 6120. May be repeated up to 3 credits.

Learning Outcomes

1. This doctoral level course explores in depth various theories about literacy.
2. Placed in the bilingual and multicultural context, this course critically reviews and brings to the forefront key linguistic, educational, socio-economic, political, cultural, and racial issues related to literacy.
3. It goes on to unveil and carefully analyze various ideological forces informing multiple forms of literacy and the effects of these forces on student learning, teachers' teaching practices, and people's lives in general.

BLED 6130. Literacy / Biliteracy Assessment and Evaluation**3 Credits (3)**

Developing students ability to understand and critique both traditional and alternative forms of assessment.

Learning Outcomes

1. Literacy assessment and evaluation
2. Documenting student language and literacy development
3. Interpreting and analyzing your documentation/data
4. Generating and implementing appropriate, engaging and effective literacy instructions in order to meet children's interests and needs
5. Linguistics, psycholinguistics, sociolinguistics and their relationships
6. Readers and writers as users of language.
7. Relationships between reading, writing and text
8. Reading strategies and instructional implications
9. Kidwatching: documenting and analyzing literacy processes and events 1
10. Miscue Analysis: Understanding and analyzing children's oral reading 1
11. Defining oneself as a literate person

BLED 6210. Curriculum and Instructional Leadership**3 Credits (3)**

The purpose of this course is to examine the concepts of leadership and curriculum. This examination will focus on the dynamic relationships of these concepts in our society and their differentiated effects on diverse community groups. Our examination will lead us on a development and contributions. Taught with: EDUC 6210.

Learning Outcomes

1. To become well versed in those issues surrounding leadership and curriculum and their impact on various groups in society.
2. To develop an understanding of how the interactions of leadership, curriculum, and multiculturalism impacts distribution of knowledge in our society.
3. To develop an appreciation for the diverse representations of the concepts curriculum and leadership.
4. To evolve an understanding of the interconnectedness of leadership, curriculum, multiculturalism, and people.
5. For you to determine: A good leader-

BLED 6220. Praxis and Reflexivity**3 Credits (3)**

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. May be repeated up to 3 credits.

Learning Outcomes

1. Thematic and theoretical explorations aimed at setting the path for your dissertation research
2. Theorization and the actualization of your own educational praxis and reflexivity as educators within this 'new world order', Therefore we will read, discuss and enact some theoretical and practical ideas by well-known and not so well-known thinkers and researchers who have been working on these issues for several years.

BLED 6310. Critical Theory and Pedagogy**3 Credits (3)**

The course will explore critical theory and pedagogy and its applications to everyday life, teaching and learning. Taught with: EDUC 6310.

Learning Outcomes

1. Review, study and write about the history of critical theory and pedagogy.
2. Become familiar with current research regarding critical theory and pedagogy and to gain knowledge and understanding of its application to teaching and learning.
3. Create the opportunity to interact with peers and instructor regarding course topics.
4. Begin to understand the why and not only the how and what of critical theory and its pedagogies.

BLED 6320. Social Justice Issues in Education**3 Credits (3)**

Students are introduced to social justice issues as they relate to education. In particular, we will seek to understand the interconnectedness and relationship between the social construction of inequity within education and the ways in which teachers, students, researchers and administrators grapple with such inequities. There will be an examination of historical and social injustices, social movements that seek to overcome these injustices, and contemporary work done by activists around the globe to cause transformation with such issues. Crosslisted with: EDUC 637.

Learning Outcomes

1. Define and describe key social justice concepts and principles in education,
2. Compose documents and reports while correctly utilizing American Psychological Association (APA) format,
3. Develop online resources for use in their work,
4. Critique and reflect upon diverse theoretical frameworks,
5. Utilize conceptual frameworks to analyze divergent theories in education, and
6. Apply information provided in this course to real-life situations.

BLED 6992. Directed Study in Bilingual Education**1-6 Credits (1-6)**

Independent research topics in bilingual education based on particular individual interest or needs. May be repeated up to 6 credits.

Learning Outcomes

1. Analyze selected topics of interest in bilingual education selected by the student.

BLED 6998. Internship in Bilingual Education**3 Credits (3)**

In this course you will apply your knowledge developed in prior coursework about the research, history, theories, policies, pedagogies, and practices in bilingual education. You will apply this knowledge in a bilingual internship setting where you will conduct your own research.

Learning Outcomes

1. The Internship has traditionally meant that you will be involved in practicing what you have learned in a series of studies you have taken or are taking.
2. In this course, we will cover research topics and themes related to bilingual education.

BMGT-BUSINESS MANAGEMENT**BMGT 112. Banks and Your Money****3 Credits (3)**

Banking in today's economy: language and documents of banking, check processing, teller functions, deposit function, trust services, bank bookkeeping, loans, and investments. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

BMGT 126. Retail Management**3 Credits (3)**

Phases of retailing, including types of retail outlets and basic problems of organizing and operating a retail store. Restricted to: Community Colleges only.

BMGT 132. Principles of Selling**3 Credits (3)**

Analysis of customer behavior, persuasive communication, process of the sales interview. Restricted to: Community Colleges only.

BMGT 136. Forecasting Business Activity**3 Credits (3)**

Course covers the important elements of forecasting all types of business activities including inventory control, revenue forecasts, staffing, and other industry specific activities using metrics and data analysis processes. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): BUSA 1110.

BMGT 138. Advertising**3 Credits (3)**

Psychological approach to non-personal consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures. Restricted to: Community Colleges only.

BMGT 140. Principles of Supervision I**3 Credits (3)**

Principles of supervision emphasizing planning, organization, rating of employees and procedures to develop good morale. Introduction to interpretation of case studies. Restricted to: Community Colleges only.

BMGT 150. Income Taxation**3 Credits (3)**

Federal income taxation of individuals, sole proprietorships, partnerships, corporations, trusts, and estates with particular reference to CLU, life insurance and annuities. Restricted to: Community Colleges only.

BMGT 155. Special Topics I**1-3 Credits (1-3)**

Introductory special topics of lower division level work that provides a variety of timely subjects and content material. May be repeated up to 9 credits. Restricted to Community Colleges campuses only.

BMGT 160. Self-Presentation and Etiquette**3 Credits (3)**

Introduction to business etiquette based on tradition, social expectations, and professional behavior standards. Restricted to: Community Colleges only.

BMGT 201. Work Readiness and Preparation**3 Credits (3)**

Instruction in methods of selection, seeking, acquiring and retaining employment. Addresses work success skills, business etiquette, employer expectation and workplace norms. Restricted to Community Colleges campuses only.

BMGT 205. Customer Service in Business**3 Credits (3)**

Establishes concepts of service quality in relationship to business success and maximization of returns to the organization. Explores techniques for delivering quality and service in a variety of business settings. Restricted to: Community Colleges only.

BMGT 208. Business Ethics**3 Credits (3)**

The course examines the underlying dimensions of ethics in business, investigating ethics in relationship to the organization, the stakeholders, and society. Exploration of ethical issues from a historical context, analyzing actual events through the lens of business decision making, including legal/political, sociocultural, economic, and environmental considerations will be undertaken. Restricted to Community Colleges campuses only.

BMGT 216. Business Math**3 Credits (3)**

Application of basic mathematical procedures to business situations, including percentage formula applications, markup, statement analysis, simple and compound interest, and annuities. Restricted to: Community Colleges only.

Prerequisite(s): CCDM 103 N or satisfactory math score on ACT.

BMGT 221. Internship I**1-3 Credits (1-3)**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: BMGT majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

BMGT 225. Introduction to Commercial Lending**3 Credits (3)**

Commercial lending overview, the lending process, portfolio management, and regulation and business development. Restricted to: Community Colleges only.

Prerequisite(s): BMGT 112.

BMGT 232. Personal Finance**3 Credits (3)**

Budgeting, saving, credit, installment buying, insurance, buying vs. renting a home, income tax statement preparation, investment, and estate disposal through will and trust. Restricted to: Community Colleges only.

BMGT 236. Small Business Start-Up**3 Credits (3)**

Starting a small business is a complex endeavor that requires specialized knowledge. This course prepares students to take the first step in business ownership and operations. Restricted to Community Colleges campuses

Learning Outcomes

1. Identify the unique challenges of starting a small business.
2. Identify opportunities to start up a business and conduct a needs analysis.
3. Develop value proposition/market fit for proposed products and services.
4. Develop an appropriate business model.
5. Identify the availability of necessary resources.

BMGT 237. Managing Small Businesses**3 Credits (3)**

Managing a small business requires the owner/operator to be proficient in a number of skills and technical areas. This course provides small business owners/operators with the training and essential knowledge to manage a small business. Restricted to Community Colleges campuses

Learning Outcomes

1. Identify the strengths and weaknesses of small businesses
2. Define entrepreneurship and identifying its traits
3. Demonstrate a capability to explore and research business opportunities
4. Explain how to plan to start a new business, identifying legal structures, financing options, and organizing a management team
5. Identify and analyze financial statements
6. Review the importance of management information systems
7. Identify their own managerial leadership style
8. Review purchasing and inventories, taxation and insurance
9. Describe the process of writing a business plan

BMGT 247. Customer Relationship Management**3 Credits (3)**

The course addresses the application of positive customer relationship practices and demonstrates the connection between managing excellent customer experiences and business success. Customer related decision making processes through the use of data based decision matrices are introduced. Restricted to Community Colleges campuses

Learning Outcomes

1. Recognize and explain the concept of customer service.
2. Describe the basic factors in Customer Relationship Management (CRM).
3. Explain how technological tools can support CRM processes.
4. Discuss the impact of CRM on the marketing processes.
5. Describe how effectively using CRM techniques impacts customer satisfaction.
6. Demonstrate the use of data to make effective CRM decisions.

BMGT 250. Diversity in the Workplace**3 Credits (3)**

Concepts of culture, diversity, prejudice, and discrimination within the domestic workforce/society. Restricted to Community Colleges campuses only.

Prerequisite(s): BUSA 1110.

BMGT 272. E-Commerce Operations**3 Credits (3)**

Includes the many forms of e-commerce and emerging technologies that will impact the business of tomorrow. Restricted to Community Colleges campuses only.

Prerequisite(s): OECS 105 or BCIS 1110.

BMGT 277. Entrepreneurship II - Small Business Management**3 Credits (3)**

This course is designed to acquaint the student with the opportunities encountered in the management and operations of a small business enterprise. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): ENTR 1110.

BMGT 280. Introduction to Human Resources**3 Credits (3)**

Personnel functions encompassing job analysis, recruitment, selection, training, appraisals, discipline, and terminations. Prerequisite(S): BUSA 1110 or B A 104. Restricted to Community Colleges campuses only.

BMGT 282. Introduction to International Business Management**3 Credits (3)**

Overview of the social, economic and cultural environment of international business transactions. Restricted to Community Colleges only.

Prerequisite(s): BUSA 1110.

BMGT 285. Introduction to Manufacturing Operations**3 Credits (3)**

Introduction to issues related to manufacturing, including an overview of the production function, product design and development, location, layout, forecasting, planning, purchasing, materials/inventory, and quality management. Restricted to Community Colleges campuses only.

Prerequisite(s): BUSA 1110 and (BMGT 140 or MGMT 2110).

BMGT 286. Introduction to Logistics**3 Credits (3)**

Overview on the planning, organizing, and controlling of transportation, inventory maintenance, order processing, purchasing, warehousing, materials, handling, packaging, customer service standards, and product scheduling. Restricted to: Community Colleges only.

BMGT 287. Introduction to Export/Import**3 Credits (3)**

Procedures and documentation for exporting and importing products. Emphasis on NAFTA regulations and other U.S. border operations crossings. Restricted to Community Colleges only.

Prerequisite(s): BUSA 1110.

BMGT 290. Applied Business Capstone**3 Credits (3)**

Refines skills and validates courses taken in BMGT program. Business simulations, case studies and projects used to test and improve business practices. Student must be within 25 credits of graduation. Restricted to: BMGT majors. Restricted to Community Colleges campuses only.

Prerequisite: BUSA 1110, and (BMGT 140 or MGMT 2110), and (BMGT 240 or SOCI 1110G or PSYC 1110G), and MKTG 2110.

Learning Outcomes

1. Plan, design, and create a real world project related to their field of study.
2. Participate in job shadowing in positions related to their field of study.
3. Create a portfolio in preparation for career applications.
4. Collaborate as a member of a team in their field of study.
5. Identify and use ethical decision-making in working on individual projects, job shadowing, and a team.

BMGT 298. Independent Study**3 Credits (3)**

Individual studies directed by consenting faculty with prior approval of department chair. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): Sophomore standing with 3.0 GPA.

BUSA-BUSINESS ADMINISTRATION

BUSA 1110. Intro to Business**3 Credits (3)**

Fundamental concepts and terminology of business including areas such as management, marketing, accounting, economics, personnel, and finance; and the global environment in which they operate.

Learning Outcomes

1. Explain how business and entrepreneurship affect the quality of life and the world around us.
2. Explain the characteristics of the different forms of business ownership.
3. Perform basic stakeholder analysis concerning accountability, ethics and social responsibility of business.
4. Demonstrate knowledge of the various dimensions of the business environment including political and legal, socio-cultural, environmental, diversity, economic, technological, and global.
5. Describe the purpose and functions of finance, operations, marketing, management, accounting, and information systems.
6. Demonstrate basic skills such as use of common business terminology, information search skills, presentation and writing skills, and team skills.
7. Describe the purpose and content of a business plan.

BUSA 2230G. Human Relations in Business**3 Credits (3)**

This course is an examination and application of personal and interpersonal competencies and skills needed in a business setting to understand oneself, one's co-workers, employers, and customers. Students will investigate and examine attitudes, behavior, ethical behavior and cultural influences that affect the business environment. It offers structured situations in which interpersonal relationships and communication skills are explored. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and describe the relevance and development of human relations theories as they apply to management, interpersonal interactions, leadership, conflict resolution, and other behaviors in the workplace.
2. Critically examine how individual beliefs, values, attitudes, and perceptions of the world are formed and discuss how they affect self-esteem and human interactions in the workplace individually and in formal and informal groups.
3. Recognize differing communication styles and apply effective communication skills to various workplace situations.
4. Examine the interrelationships between self, culture, ethnicity, gender, and personal environment and analyze their effects on the development of individual work behaviors.
5. Articulate the factors that influence the development of communication, self-esteem, motivation, trust, leadership, and conflict resolution skills.
6. Apply knowledge of human behavior and its origins to the analysis of workplace case studies and the development of solutions to workplace dilemmas.
7. Apply ethical decision-making in business situations.

C E-CIVIL ENGINEERING

C E 109. Computer Drafting Fundamentals

3 Credits (2+2P)

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and E T 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

C E 151. Introduction to Civil Engineering

3 Credits (3)

Problem solving and use of computer software for civil engineering applications. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 1220G.

C E 198. Special Topics

1-3 Credits

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 233. Mechanics-Statics

3 Credits (3)

Engineering mechanics using vector methods. May be repeated up to 3 credits.

Prerequisite(s): MATH 1521G or MATH 1521H, PHYS 1310G and cumulative GPA of 2.0.

C E 234. Mechanics-Dynamics

3 Credits (3)

Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits. Crosslisted with: M E 234.

Prerequisite(s): C E 233, MATH 1521G or MATH 1521H, PHYS 1310G.

C E 256. Environmental Engineering and Science

3 Credits (3)

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control.

Crosslisted with: ENVS 2111

Prerequisite: CHEM 1215G and MATH 1511G or ENGR 190.

Learning Outcomes

1. To understand the nature of water quality parameters in the context of Civil Engineering and Environmental Science (Water Treatment/Wastewater Treatment/Environmental Science)
2. To learn to apply engineering and scientific solutions to water quality problems
3. To understand environmental regulations and their consequences on the design of pollution control systems

C E 256 L. Environmental Science Laboratory

1 Credit (1P)

Laboratory experiments associated with the material presented in C E 256. Same as ENVS 2111L.

Corequisite(s): C E 256.

C E 298. Special Topics

1-3 Credits

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 301. Mechanics of Materials

3 Credits (3)

Stress, strain, and elasticity of materials. May be repeated up to 3 credits.

Prerequisite: ENGR 233.

Learning Outcomes

1. Calculate deformations, stresses, and strains of various types of members under loading.
2. Calculate principal stresses and strains.
3. Perform two-dimensional stress and strain transformation.
4. Analyze statically indeterminate structures using the method of consistent deformations.
5. Construct shear and moment diagrams for beam type structures.
6. Calculate beam deflections and rotations using various methods.
7. Determine buckling loads for elastic columns.

C E 311. Civil Engineering Materials

3 Credits (2+3P)

Introduction to the structure, physical properties, testing and mechanical behavior of civil engineering materials and components made from these materials.

Prerequisite: C E 301.

C E 315. Structural Analysis

4 Credits (3+3P)

Classical analysis of determinate and indeterminate structures; introduction to modern methods of structural analysis using computer programs.

Prerequisite(s): C E 301.

C E 331. Fluid Mechanics and Hydraulics**3 Credits (3)**

Fluid Mechanics and Hydraulics. Fundamentals and theory of fluid mechanics, compressible fluids, flow of incompressible fluids in open and closed conduits.

Prerequisite: PHYS 1310G, ENGR 233 or C E 233.

Learning Outcomes

1. Students learn how to read and interpret problem statements related to fluid mechanics and hydraulics, how to work in teams as well as apply critical thinking skills to solve problems.
2. Students develop an understanding of the theories and principles of hydraulics to understand hydraulic engineering components and subsystems.

C E 331 L. Fluid Mechanics and Hydraulics Laboratory**1 Credit (1P)**

Fundamentals and Theory of Fluid Mechanic, compressible and incompressible flow of fluids in open and closed conduits.

Prerequisite(s)/Corequisite(s): C E 331. Restricted to: C E majors.

C E 355V. Technology and the Global Environment**3 Credits (3)**

A scientific basis for understanding changes in the global environment that result through the complex interactions of natural phenomena and the impacts of the activities of man.

Prerequisites: junior or senior standing, and the general education requirements for math and natural sciences.

C E 356. Fundamentals of Environmental Engineering**3 Credits (3)**

Introduction to water treatment and water pollution and the analysis and design of selected treatment processes.

Prerequisite(s): C E 256.

C E 357. Soil Mechanics**3 Credits (2+3P)**

Engineering properties of soils, consolidation settlement, compaction, water flow through soils, geostatic stresses, soil shear strength, lateral earth pressure, and soil laboratory testing.

Prerequisite: GEOL 1110G and C E 301.

Learning Outcomes

1. The course covers the basic principles governing the mechanical behavior of soils.
2. Students will develop an understanding of soil mechanics, flow through porous media, and mass-volume relationships, as well as the laboratory methods for measuring the mechanical and index properties of soils.
3. Students will be able to interpret and use the laboratory test results for soil classification and for solving simple geotechnical engineering problems.

C E 382. Hydraulic and Hydrologic Engineering**3 Credits (3)**

Analysis and design of hydraulic systems, including pipe networks, open channels, regulating structures, and pumping systems. Surface water and groundwater hydrology, analysis and design. May be repeated up to 3 credits.

Prerequisite(s): C E 331 and C E 331 L.

C E 398. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 435. Technical Communication for Engineers**3 Credits (3)**

The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types.

Learning Outcomes

1. Ability to write in a way that is clear.
2. Ability to write in a way that is concise.
3. Ability to write in a way that is concrete.

C E 444. Elements of Steel Design**3 Credits (3)**

Analysis and design of tension members, beams, columns, and bolted and welded connections.

Prerequisite(s)/Corequisite(s): C E 311. Prerequisite(s): C E 315.

C E 445. Reinforced Concrete Design**3 Credits (3)**

Design and mechanics of structural reinforced concrete members.

Prerequisite(s)/Corequisite(s): C E 311. Prerequisite(s): C E 315.

C E 452. Geohydrology**3-4 Credits (3+1P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: ENVS 452 and GEOL 452.

Prerequisite(s): Junior or Senior.

C E 454. Wood Design**3 Credits (3)**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 455, Masonry Design.

Prerequisite(s)/Corequisite(s): C E 311. Prerequisite(s): C E 315.

C E 455. Masonry Design**3 Credits (3)**

Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454.

Prerequisite: C E 315.

Prerequisite/Corequisite: C E 311.

Learning Outcomes

1. Introduce students to topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to understand the code requirements applicable to problems in masonry design.

C E 457. Foundation Design**3 Credits (2+3P)**

Application of principles of classical soil mechanics to the design of shallow and deep foundations, and the fundamentals of geotechnical site investigation.

Prerequisite(s): C E 357.

C E 469. Structural Systems**3 Credits (3)**

Design of structural systems for buildings and bridges. May be repeated up to 3 credits.

Prerequisite(s): C E 444 or C E 445.

C E 470. Design of Municipal and Hazardous Waste Landfills**3 Credits (3)**

Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills.

Prerequisite(s): C E 357 and C E 452, or consent of instructor.

C E 471. Transportation Engineering**3 Credits (3)**

Highway and traffic design and systems. Students must be in junior or senior standing to enroll.

Prerequisite: MATH 1521G.

Learning Outcomes

1. Provide understanding of the principles of transportation engineering with a focus on highway engineering and traffic analysis
2. Provide basic skill set that will allow a student to address most of the transportation problems that are likely to appear in professional practice and on the Fundamentals of Engineering exam (FE) and the Principles and Practice of Engineering exam (PE)
3. Provide foundation for future coursework in transportation should a student wish to pursue further coursework in the field

C E 477. Engineering Economics and Construction Management**3 Credits (3)**

Engineering economics, construction and project management.

Prerequisite/Corequisite: C E 357.

Learning Outcomes

1. Understand time value of money and be able to perform economic analyses on engineering problems to determine whether a given project is worthwhile or to prioritize multiple alternatives based on present worth.
2. Understand the mathematical and ethical implications of benefit/cost and internal rate of return analyses
3. Estimate durations and requirements of individual construction tasks
4. Develop construction schedules using Critical Path Method (CPM) Analysis
5. Understand the legal and ethical concerns involved in economic analysis and construction engineering.

C E 479. Pavement Analysis and Design**3 Credits (3)**

Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, and rehabilitation concepts.

Prerequisite(s): C E 357.

C E 481. Civil Engineering Capstone Design**3 Credits (3)**

Culminating multidisciplinary project-oriented capstone design. Ethics, professional development, global issues.

Prerequisite(s)/Corequisite(s): C E 457, C E 471, C E 477. **Prerequisite(s):** C E 356, C E 382, and either C E 444 or C E 445.

C E 482. Hydraulic Structures**3 Credits (3)**

Engineering design of water-regulating structures. Capstone design course. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): C E 477. **Prerequisite(s):** C E 382.

C E 483. Surface Water Hydrology**3 Credits (3)**

Hydrologic cycle and relationships between rainfall and surface water runoff.

Prerequisite: C E 331 or consent of instructor.

C E 485. Design of Earth Dams**3 Credits (3)**

Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors.

Prerequisite: C E 357, C E 382.

Learning Outcomes

1. Course introduces the students to small earthen dam siting, design and construction based on the knowledge and skills acquired in earlier coursework.
2. Course incorporates engineering standards and realistic constraints and prepares students for entry-level work.
3. Students work in teams to design a small earthen dam.

C E 490. Introduction to Artificial Intelligence for Civil Engineers**3 Credits (3)**

Introduces various machine learning methods for solving various civil engineering problems. Topics include: supervised & unsupervised machine learning; classification and linear regressions; K-nearest neighbor; decision tree, bagging, & boosting; random forest; and support-vector machines.

Prerequisite: STAT 371.

Learning Outcomes

1. Identify appropriate data analysis methods for various civil engineering problems.
2. Perform various Machine Learning (ML) analyses to solve civil engineering problems.
3. Evaluate various forms of Machine Learning (ML) analysis results.

C E 497. Senior Seminar**1 Credit (1)**

Selected topics on the civil engineering profession and orientation for professional practice. Preparation for the FE exam. Students must be able to submit their application for degree while enrolled in this course.

Learning Outcomes

1. Prepare students for professional and ethical aspects of employment or graduate studies.

C E 498. Special Topics**1-3 Credits**

May be repeated for a maximum of 9 credits.

Prerequisite: consent of department head.

C E 501. Advanced Mechanics of Materials**3 Credits (3)**

Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on elastic foundations, column theories, torsion, thick-wall cylinders. Same as M E 501.

Prerequisites: C E 301, MATH 392.

C E 502. Advanced Mechanics of Steel Structures**3 Credits (3)**

Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion.

Prerequisite: C E 444.

Learning Outcomes

1. Introduce students to advanced topics in structural mechanics of steel structures that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in plastic design of steel structures

C E 503. Special Design and Analysis Program**3-6 Credits**

Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. May be repeated once for a total of 6 credits.

Prerequisite: consent of instructor/committee.

C E 504. Advanced Engineering Design**3 Credits (3)**

Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled.

Prerequisite: consent of instructor/committee.

C E 506. Advanced Soil Mechanics**3 Credits (3)**

Stress and strain analyses in soil, stress paths; drained and undrained shear strengths of granular soils and clays, consolidation, liquefaction, soil improvement.

Prerequisite: C E 457 or consent of instructor.

C E 507. Design of Earth Retaining Structures**3 Credits (3)**

Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing.

Prerequisite(s): C E 357.

Prerequisite(s)/Corequisite(s): C E 457.

C E 508. Advanced Soil Behavior**3 Credits (3)**

The course covers particle-scale phenomena that govern the macro-scale behavior of soils. Topics covered in the class include classical concepts as well as contemporary advances in soil mechanics. The students will develop a fundamental understanding of soil-water interaction, theories of contact level deformation, and mass and energy transport through granular media. Consent of Instructor required.

Prerequisite(s): C E 357 or Instructor Consent.

C E 509. Deep Foundations**3 Credits (3)**

Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads.

Prerequisite: C E 457 or consent of instructor.

C E 510. Introduction to Nondestructive Testing**3 Credits (3)**

This course explores the application of different Nondestructive Testing (NDT) methods in material characterization and product qualification.

Prerequisite(s): C E 311 or CHME 361 or Consent of Instructor.

C E 514. Numerical Methods in Civil Engineering**3 Credits (3)**

Mathematical, numerical, and programming foundations of applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB.

Learning Outcomes

1. To provide necessary background and skills to use MATLAB as a programming language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods.

C E 515. Finite Element Methods**3 Credits (3)**

Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software.

Prerequisite: graduate standing or consent of instructor.

C E 531. Open Channel Hydraulics**3 Credits (3)**

Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation.

Prerequisite: C E 382 or consent of instructor.

C E 535. Technical Communication for Engineers**3 Credits (3)**

The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types. Same as C E 435 with differentiated assignments for graduate students.

Learning Outcomes

1. Ability to write in a way that is clear
2. Ability to write in a way that is concise
3. Ability to write in a way that is concrete

C E 544. Advanced Design of Steel Structures**3 Credits (3)**

Connection design; beam-column analysis and design; composite construction; and plate girder design.

Prerequisite: C E 444.

Learning Outcomes

1. Introduce students to advanced topics in steel design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural steel design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural steel design

C E 545. Advanced Concrete Design**3 Credits (3)**

Advanced topics in ultimate strength design of reinforced concrete that include: concrete footings, retaining structures, short and long columns, torsion members, deep beams and shear walls, two-way slabs, and shear and moment transfer at slab-column connections.

Prerequisites: C E 445.

Learning Outcomes

1. Introduce students to advanced topics in reinforced concrete design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural concrete design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural concrete design

C E 547. Bridge Engineering**3 Credits (3)**

Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation.

Prerequisite: C E 444 or C E 445.

Learning Outcomes

1. Introduce students to topics in bridge design that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in bridge design

C E 554. Wood Design**3 Credits (3)**

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design.

C E 555. Masonry Design**3 Credits (3)**

Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554.

Learning Outcomes

1. Introduce students to advanced topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to practice masonry design.
3. Provide the background needed to understand the code requirements applicable to difficult problems in masonry design.

C E 557. Water Resources Development**3 Credits (3)**

Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details.

C E 571. Structural Dynamics**3 Credits (3)**

Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading.

Prerequisite: ENGR 234 and C E 315.

Learning Outcomes

1. Introduce students to topics in structural dynamics that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in seismic and blast-resistant design

C E 572. Earthquake Engineering**3 Credits (3)**

Earthquake characteristics; seismic loads; elastic and inelastic response; analysis and design of buildings for earthquakes.

Prerequisites: graduate standing and consent of instructor.

C E 579. Ground Improvement**3 Credits (3)**

The objective of this course is to introduce common ground improvement techniques, including mechanical (compaction, soil reinforcement, preloading and accelerated consolidation) and chemical (cementing, ion-replacement, polymer bonding) stabilization methods, as well as seepage and dewatering. Emphasis will be placed on developing an understanding of the underlying physical and chemical processes involved in each case.

Prerequisite(s): C E 357.

C E 581. Ground Water Hydrology**3 Credits (3)**

Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality.

Prerequisites: MATH 392, G EN 452, and C E 382, or consent of instructor.

C E 582. Statistical Hydrology**3 Credits (3)**

Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. May be repeated up to 3 credits.

C E 585. Slope Stability Analysis and Design**3 Credits (3)**

Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.

Learning Outcomes

1. Be familiar with the implications of drainage conditions and pore water pressure in the soil as they relate to soil shear strength and slope stability.
2. Be able to recognize the differences between short-term and long-term analyses (total versus effective stress analyses) applied to slope stability.
3. Be able to perform hand calculations of slope stability for very simple cases.
4. Be familiar with the set of input data usually required to perform stability analyses using software.
5. Be able to design soil slopes with various soil profiles and geometry and reinforcement using slope stability software.
6. Recognize and understand the effects of geologic and groundwater conditions on the stability of soil slopes.
7. Understand the mechanisms by which the most common methods of slope stabilization work (tie-backs, soil nailing, geosynthetics).

C E 590. Advanced Artificial Intelligence for Civil Engineers**3 Credits (3)**

Deep learning methods for solving civil engineering problems.

Topics include: introduction, backpropagation, training, regulations, and techniques of Neural Networks (NN); image processing using Convolutional Neural Networks (CNN); time-series data analysis using Recurrent Neural Networks (RNN); Gated Recurrent Units; and introduction to Transfer Learning.

Prerequisite: STAT 371 and MATH 392.

Learning Outcomes

1. Identify appropriate data analysis methods and utilize mathematical formulations of Deep Learning (DL) for various civil engineering problems.
2. Perform various Deep Learning (DL) analyses to solve civil engineering problems.
3. Evaluate various forms of Deep Learning (DL) analysis results.

C E 596. Special Topics**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

C E 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester.

C E 599. Master's Thesis**1-15 Credits**

Thesis.

C E 600. Doctoral Research**1-15 Credits**

Research.

C E 604. Advanced Engineering Topics**3 Credits (3)**

In depth study of a topic at the forefront of environmental engineering & science. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally.

C E 614. Advanced Numerical Methods in Civil Engineering**3 Credits (3)**

Advanced mathematical, numerical, and programming for applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB. Same as C E 514 with differentiated material and assignments for C E 614 students.

Learning Outcomes

1. To provide necessary background and skills to use MATLAB as a programming language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods, and (7) time series analysis such as Fourier transform, wavelet, and basic filtering.

C E 615. Advanced Finite Element Methods**3 Credits (3)**

Finite element method with emphasis on stress analysis. May include development and use of plane stress, plane strain, and 3-D and shell elements. Includes static, dynamic, and nonlinear analysis.

Prerequisite: graduate standing.

C E 682. Topics in Hydrodynamics II**3 Credits (3)**

Selected topics in hydrometeorology, including the transfer of water and energy between the land surface and the lower atmosphere.

Learning Outcomes

1. This course helps lay the foundation for theoretical concepts useful in measurement, analysis and estimation of evaporation/evapotranspiration. Students learn some of the theoretical concepts and relationships useful in the phenomenon of evaporation as well as gain some field experience on measurement of evapotranspiration and open water evaporation.

C E 698. Special Research Programs**1-3 Credits**

May be subtitled. May be repeated for a maximum of 9 credits.

C E 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

C S-COMPUTER SCIENCE

C S 111. Computer Science Principles**4 Credits (3+2P)**

This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future. May be repeated up to 4 credits.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Identify and differentiate programming constructs like IF, FOR, and WHILE
2. Convert numbers between Hexadecimal, Binary and Decimal
3. Write pseudo code to manipulate a robot
4. Use an ASCII table to translate HEX strings into characters
5. Encrypt and Decrypt simple messages with a Caesar Cypher

C S 117. Introduction to Computer Animation**3 Credits (3)**

Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

C S 151. C++ Programming**3 Credits (2+2P)**

Introduction to object-oriented programming in the C++ language. The focus will be on preparing students to use C++ in their own areas. No prior programming experience is required. Taught with C S 451.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Use various data types and the corresponding operations.
2. Write C++ programs that contain expressions, program control, functions, arrays, and input/output
3. Explain basic object-oriented programming concepts.
4. Demonstrate proficiency in using classes, inheritance, pointers, streams, and recursion

C S 152. Java Programming**3 Credits (2+2P)**

Programming in the Java language. May be repeated up to 3 credits.

Prerequisite(s): MATH 1215 or higher.

C S 153. Python Programming I**3 Credits (3)**

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. Taught with C S 453.

Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Develop an algorithm to solve a problem
2. Demonstrate the ability to use Python data types: int, float, strings, and lists; and the built-in functions associated with those data types
3. Edit and debug programs using the Spyder IDE for Python
4. Implement algorithms using the Python features of assignment, input, output, branches, loops, and functions
5. Explain the fundamental concepts of object-oriented programming with Python
6. Design and implement Python classes based on given attributes and behaviors
7. Work with existing Python modules such as math, random, and os
8. Write Python programs that input data from files and store results in files

C S 154. Python Programming II**3 Credits (3)**

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

Prerequisite(s): C S 153 or C S 453.

C S 158. R Programming I**3 Credits (3)**

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.

Prerequisite(s): MATH 1220G.

C S 171G. Modern Computing in Practice**4 Credits (3+2P)**

This course provides a survey of practical and theoretical foundations for how computers work and how they support fundamental organizational needs. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Lab assignments provide hands-on applications to use simple basic software tools to write simple programs, build and edit websites, analyze data with spreadsheets, choose an office productivity suite, and demonstrate computer literacy to potential employers. May be repeated up to 4 credits.

Prerequisite: MATH 1130G or MATH 1215 or higher.

Learning Outcomes

1. Students will create simple python programs using conditional statements and loops
2. Students will analyze data with spreadsheet formulas, charts, and tools
3. Students will create and publish a personal website using website building tools
4. Students will edit HTML and CSS to format a website manually
5. Students will practice the skill of performing software QA and providing actionable feedback to developers
6. Students will become aware of common cybersecurity risks
7. Students will learn basic vocabulary and context for broad aspects of hardware, software, and computer science theory such as Security, Privacy, Cloud Computing, the Internet, the Web, Operating Systems, Discrete Math, and Information Systems
8. Students will be exposed to various sub-fields of CS including artificial intelligence, security, data analytics, UX, web development, and QA testing
9. Students will reason about the societal impacts of technology
10. Students will incorporate their new knowledge and skills into their resume

C S 172. Computer Science I**4 Credits (3+2P)**

Computational problem solving; problem analysis; implementation of algorithms using Java. Object-oriented concepts, arrays, searching, sorting, and recursion. Taught with C S 460. May be repeated up to 4 credits.

Prerequisite: (A C- or better in either MATH 1250G or (MATH 1430G or higher)) OR (A C- or better in MATH 1220G and a 1 or better in the CS Placement Test) OR (A C- or better in MATH 1220G and a C- or better in C S 111).

Learning Outcomes

1. Develop algorithms to solve problems
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion
3. Apply an understanding of primitive and object data types
4. Design and implement classes based on given attributes and behaviors
5. Explain the fundamental concepts of object-oriented programming,

C S 209. Special Topics.**1-3 Credits**

May be repeated for a maximum of 12 credits.

C S 271. Object Oriented Programming**4 Credits (3+2P)**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Pointers and dynamic memory allocation. Hands-on experience with useful development tools. Taught with C S 462. May be repeated up to 4 credits.

Prerequisite: At least a C- in C S 172 or ENGR 140.

Learning Outcomes

1. Develop an algorithm to solve a problem.
2. Implement algorithms using the C and C++ languages including imperative and object-oriented language features.
3. Beyond what was learned in C S 172, E E 112, or E E 161 demonstrate a noticeable increase in understanding of problem analysis and program design.
4. Demonstrate proficiency in using control structures including if statements (single selection), switch (multiple selection), and loops (repetition).
5. Demonstrate proficiency in using arrays and functions
6. Create UML class and relationship diagrams.
7. Design a class to model a real-world person, place, thing, or event.
8. Use editing and debugging software to create, debug, and test C and C++ programs.
9. Understand the basic terminology used in object-oriented programming. 1
10. Create a make file to build an executable from a set of C or C++ source files.

C S 272. Introduction to Data Structures**4 Credits (3+2P)**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Taught with C S 463.

Prerequisite: At least a C- in C S 172, or placement.

Learning Outcomes

1. Be able to implement and use lists
2. Be able to implement and use stacks
3. Be able to implement and use queues
4. Be able to implement and use trees
5. Be able to perform the run time analysis of basic algorithms using Big O notation
6. Be able to implement, use, and analyze searching algorithms
7. Be able to solve a problem recursively
8. Take a problem statement from a user and convert it into a Java program that fulfills the user's needs
9. Create object oriented Java classes that effectively separate and hide implementation details from client applications

C S 273. Machine Programming and Organization**4 Credits (3+2P)**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Taught with C S 464. May be repeated up to 4 credits.

Prerequisite: At least a C- in C S 172 or ENGR 140.

Learning Outcomes

1. Describe the architecture of a microcontroller, the interconnections between the components, and the basic units inside the CPU
2. Use signed and unsigned numbers, the associated branching instructions, and the corresponding flags in the status register
3. Explain immediate, direct, indirect addressing modes, their opcode and operands, and their utilities
4. Map high-level programming language features to assembly instructions, including loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion
5. Interface with I/O devices including LED and sensors via digital input and output, and analog-to-digital conversion
6. Program timers/counters and interrupts to control real-time applications
7. Design an assembly program

C S 278. Discrete Mathematics for Computer Science**4 Credits (3+2P)**

Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. Taught with C S 465.

Prerequisite: At least C- in C S 172.

Learning Outcomes

1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction
3. Use summations, formulas for the sum of arithmetic and geometric sequences
4. Explain and apply the concepts of sets and functions
5. Apply counting principles to determine the number of various combinatorial configurations

C S 343. Algorithm Design & Implementation**3 Credits (3)**

Introduction to efficient data structure and algorithm design. Basic graph algorithms. Balanced search trees. Classic algorithm design paradigms: divide-and-conquer, greedy scheme, and dynamic programming. Taught with C S 493.

Prerequisite: At least a C- in C S 272, or consent of instructor.

Learning Outcomes

1. Be able to use and implement sorting algorithms
2. Be able to design and implement graph algorithms
3. Be able to design and implement algorithms using the divide-and-conquer technique
4. Be able to design and implement algorithms using the greedy technique
5. Be able to design and implement algorithms using the dynamic programming technique
6. Be able to use and implement balanced search trees
7. Be able to use and implement hashing techniques
8. Be able to perform the run time analysis of basic algorithms using Big O notation

C S 370. Compilers and Automata Theory**4 Credits (3+2P)**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. Taught with C S 466.

Prerequisite: At least a C- in C S 271, C S 272, and C S 273.

Learning Outcomes

1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA
3. Apply recursive descent parsing in programming a parser of a small grammar
4. Understand the ideas in LL and LR parsing of context-free language classes
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence

C S 371. Software Development**4 Credits (3+2P)**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. Taught with C S 468.

Prerequisite: At least a C- in C S 271 and C S 272.

Learning Outcomes

1. Understand and explain the activities and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system
3. Apply high and low level design ideas to create an object-oriented design of a software system
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages
5. Apply white and black box testing techniques and tools to individual and team software development
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain)
7. Use practical software development tools, including version control systems, automated build tools, and testing tools

C S 372. Data Structures and Algorithms**4 Credits (3+2P)**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. Taught with C S 469. May be repeated up to 4 credits.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Analyze the growth of functions via asymptotic notation
2. Evaluate the asymptotic running time of a given algorithm
3. Solve recurrence relations of the kinds encountered in algorithm analysis
4. Design algorithms using the divide-and-conquer technique
5. Design algorithms using the greedy technique
6. Design algorithms using the dynamic-programming technique
7. Use and analyze data structures based on trees
8. Analyze the design, correctness, and time complexity of basic graph algorithms

C S 380. Introduction to Cryptography**3 Credits (3)**

The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Consent of Instructor required. Taught with: C S 525.

Prerequisite: C S 278 (or equivalent) with a C or better.

Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of cryptographic primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions;
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

C S 381. Principles of Virtual Reality**3 Credits (3)**

This course is an introduction to building systems and doing research in / on virtual reality. We cover system design, development, and evaluation, with an emphasis on recent research in the space. We cover a range of methods, qualitative and quantitative, in order to develop insights into effective VR designs. Students in this class will develop a foundation in VR development; learn about current topics in VR; and design, develop, evaluate, and report on a VR system. Consent of Instructor required.

Prerequisite: C S 485.

Learning Outcomes

1. Design and develop systems in virtual reality.
2. Understand the variety of development techniques in VR.
3. Understand the state-of-the-art in VR systems.
4. Communicate understanding of people, designs, and evaluations through presentations, demos, and/or reports.

C S 382. Modern Web Technologies**3 Credits (3)**

In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and responsive web design. Finally, we cover advanced topics including the design and implementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Consent of Instructor required. Taught with: C S 532.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

C S 383. Introduction to Deep Learning**3 Credits (3)**

The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught together with C S 533. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

C S 384. Graph Data Mining**3 Credits (3)**

The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining
2. Graph representation and graph querying using graph manipulating toolbox/library
3. Use random and scale-free graph models to generate graphs and visualize complex network properties
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization
5. Implement graph representation learning algorithms and graph neural networks
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

C S 409. Independent Study**1-6 Credits (1-6)**

Faculty supervised investigation, to culminate in a written report. May be repeated up to 6 credits.

Prerequisite(s): Written agreement with faculty supervisor.

C S 419. Computing Ethics and Social Implications of Computing
1 Credit (1)

An overview of ethics for computing majors includes: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems.

Prerequisite: At least a C- in C S 371.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

C S 448. Senior Project**4 Credits (4)**

Capstone course in which C S majors work in teams and apply computer science skills to complete a large project. Restricted to: C S majors.

Prerequisite: At least a C- in C S 370 and C S 371.

Learning Outcomes

1. Apply design and development principles in the construction of software systems of varying complexity
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. Use current techniques, skills, and tools necessary for computing practice
5. Analyze a problem, and identify and define the computing requirements appropriate to its solution
6. Function effectively as teams to accomplish a common goal
7. Communicate effectively with a range of audiences

C S 449. Senior Thesis**4 Credits (4)**

Capstone course in which C S majors apply computer science skills to complete a research project, culminating in a written thesis report. Restricted to: C S majors.

Prerequisite: At least a C- in C S 370 and C S 371.

Learning Outcomes

1. Apply design and development principles in the construction of software systems of varying complexity
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
4. Use current techniques, skills, and tools necessary for computing practice
5. Analyze a problem, identify, and define the computing requirements appropriate to its solution
6. Communicate effectively with a range of audiences via presentations and technical reports

C S 451. C++ Programming**3 Credits (3)**

Programming in the C++ language. Taught with C S 151. More advanced than C S 151. Recommended for nonmajors only. Not for CS undergraduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Use various data types and the corresponding operations.
2. Write C++ programs that contain expressions, program control, functions, arrays, and input/output.
3. Explain basic object-oriented programming concepts.
4. Demonstrate proficiency in using classes, inheritance, pointers, streams, and recursion.

C S 452. Java Programming**3 Credits (2+2P)**

Programming in the Java language. More advanced than C S 152. Recommended for nonmajors only. Not for CS undergraduate standing. May be repeated up to 3 credits.

C S 453. Python Programming I**3 Credits (3)**

This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. Taught with C S 153. More advanced than C S 153.

Learning Outcomes

1. Develop an algorithm to solve a problem
2. Demonstrate the ability to use Python data types: int, float, strings, and lists; and the built-in functions associated with those data types
3. Edit and debug programs using the Spyder IDE for Python
4. Implement algorithms using the Python features of assignment, input, output, branches, loops, and functions
5. Explain the fundamental concepts of object-oriented programming with Python
6. Design and implement Python classes based on given attributes and behaviors
7. Work with existing Python modules such as math, random, and os
8. Write Python programs that input data from files and store results in files

C S 454. Python Programming II**3 Credits (3)**

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas. For graduate students only. Has more advanced work than C S 154, and does not count towards CS major requirements. Not for CS undergraduate students. May be repeated up to 3 credits. Restricted to: exclude C S majors.

Prerequisite(s): C S 153 or C S 453.

C S 458. R Programming I**3 Credits (3)**

This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used. For graduate students only. Has more advanced work than C S 158. Does not count towards CS major requirements. May be repeated up to 3 credits.

Prerequisite(s): Good understanding of college algebra or higher.

C S 460. Computer Science I Transition**3 Credits (3)**

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For C S graduate students only; cannot be used to meet a C S student's program of study. Taught with C S 172.

Learning Outcomes

1. Develop algorithms to solve problems
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion
3. Apply an understanding of primitive and object data types
4. Design and implement classes based on given attributes and behaviors
5. Explain the fundamental concepts of object-oriented programming

C S 462. Object Oriented Programming Transition**3 Credits (3)**

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 271.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Develop an algorithm to solve a problem.
2. Implement algorithms using the C and C++ languages including imperative and object-oriented language features.
3. Demonstrate a noticeable increase in understanding of problem analysis and program design beyond what was learned in C S 172, E E 112, or E E 161
4. Demonstrate proficiency in using control structures including if statements (single selection), switch (multiple selection), and loops (repetition).
5. Demonstrate proficiency in using arrays and functions.
6. Create UML class and relationship diagrams.
7. Design a class to model a real-world person, place, thing, or event.
8. Use editing and debugging software to create, debug, and test C and C++ programs.
9. Understand the basic terminology used in object-oriented programming. 1
10. Create a make file to build an executable from a set of C or C++ source files.

C S 463. Introduction to Data Structures Transition**3 Credits (3)**

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, dequeues, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 272.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Be able to implement and use lists
2. Be able to implement and use stacks
3. Be able to implement and use queues
4. Be able to implement and use trees
5. Be able to perform the run time analysis of basic algorithms using Big O notation
6. Be able to implement, use, and analyze searching algorithms
7. Be able to solve a problem recursively
8. Take a problem statement from a user and convert it into a Java program that fulfills the user's needs
9. Create object oriented Java classes that effectively separate and hide implementation details from client applications

C S 464. Machine Programming and Organization Transition**3 Credits (3)**

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 273.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Describe the architecture of a microcontroller, the interconnections between the components, and the basic units inside the CPU
2. Use signed and unsigned numbers, the associated branching instructions, and the corresponding flags in the status register
3. Explain immediate, direct, indirect addressing modes, their opcode and operands, and their utilities
4. Map high-level programming language features to assembly instructions, including loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion
5. Interface with I/O devices including LED and sensors via digital input and output, and analog-to-digital conversion
6. Program timers/counters and interrupts to control real-time applications
7. Design an assembly program

C S 465. Discrete Math for Computer Science Transition**3 Credits (3)**

Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. For C S graduate students only. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 278.

Prerequisite: At least a C- in C S 172 or C S 460 or consent of instructor.

Learning Outcomes

1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction
3. Use summations, formulas for the sum of arithmetic and geometric sequences
4. Explain and apply the concepts of sets and functions
5. Apply counting principles to determine the number of various combinatorial configurations

C S 466. Compilers and Automata Transition**3 Credits (3)**

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For C S graduate students only; cannot be used in a students program of study. Taught with C S 370.

Prerequisite: At least a C in (C S 271 or C S 462), in (C S 272 or C S 463), in (C S 273 or C S 464), or consent of instructor.

Learning Outcomes

1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA
3. Apply recursive descent parsing in programming a parser of a small grammar
4. Understand the ideas in LL and LR parsing of context-free language classes
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence

C S 468. Software Development Transition**3 Credits (3)**

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. For C S graduate students only. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with C S 371.

Prerequisite: At least a C- in C S 271 or C S 462, in C S 272 or C S 463, or consent of instructor.

Learning Outcomes

1. Understand and explain the activities and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system
3. Apply high and low level design ideas to create an object-oriented design of a software system
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages
5. Apply white and black box testing techniques and tools to individual and team software development
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain)
7. Use practical software development tools, including version control systems, automated build tools, and testing tools

C S 469. Data Structure and Algorithms Transition**3 Credits (3)**

Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. For CS graduate students only. Taught with CS 372. May be repeated up to 24 credits.

Prerequisite: At least a C- in (C S 272 or C S 463) and a C- in (C S 278 or C S 465), or consent of instructor.

Learning Outcomes

1. Analyze the growth of functions via asymptotic notation
2. Evaluate the asymptotic running time of a given algorithm
3. Solve recurrence relations of the kinds encountered in algorithm analysis
4. Design algorithms using the divide-and-conquer technique
5. Design algorithms using the greedy technique
6. Design algorithms using the dynamic-programming technique
7. Use and analyze data structures based on trees
8. Analyze the design, correctness, and time complexity of basic graph algorithms

C S 471. Programming Language Structure I**3 Credits (3)**

Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for C S graduate students.

Prerequisite: At least a C- in C S 370 and C S 371.

Learning Outcomes

1. Improve the background for choosing appropriate programming languages for certain classes of programming problems
2. Increase the ability to learn new programming languages
3. Critically evaluate what paradigm and language are best suited for a new problem
4. Demonstrate the use of the primary segments for a running program
5. Apply the principles of functional programming
6. Apply the principles of logic programming
7. Program a simple parallel program with threads
8. Program in at least five different programming languages
9. Program in C to demonstrate architecture details

C S 473. Architectural Concepts I**3 Credits (3)**

Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for C S graduate students.

Prerequisite: At least a C- in C S 273 and C S 370.

Learning Outcomes

1. Explain the concepts in instruction set architecture
2. Analyze the behavior of pipelined CPU data path and control
3. Analyze behavior and performance of memory hierarchies with different cache designs
4. Describe the implementation of binary integer and floating point representation and arithmetic
5. Identify and analyze performance of instruction level parallelism and multi-core parallelism
6. Describe virtual memory and architectural support for operating systems
7. Understand the organization of various kinds of secondary storage devices, and their performance and tradeoffs
8. Create software that demonstrates performance of architectural features and evaluate the effects of software change

C S 474. Operating Systems I**3 Credits (3)**

Operating system principles and structures, and interactions with architectures. Not for C S graduate students.

Prerequisite: At least a C- in C S 273, C S 371, and C S 372.

Learning Outcomes

1. Explain OS control and management of hardware resources
2. Explain OS management and execution of processes
3. Explain OS control and management of real and virtual memory
4. Explain classical concurrency issues and their solutions
5. Analyze and implement threads
6. Analyze OS interaction with networks and architecture

C S 475. Artificial Intelligence I**3 Credits (3)**

Fundamental principles and techniques in artificial intelligence systems. Intelligent Agents; solving problems by searching; local search techniques; game-playing agents; constraint satisfaction problems; knowledge representation and reasoning. Further selected topics may also be covered. Not for C S graduate students. Taught with C S 505.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Use various search algorithms commonly used in problem-solving
2. Use methods for solving constraint satisfaction problems
3. Use propositional and first-order logic to represent knowledge
4. Use logical inference methods to derive conclusions from a knowledge base
5. Use adversarial search for game-playing agents
6. Analyze the different search strategies
7. Design and Implement heuristic search for problem-solving

C S 476. Computer Graphics I**3 Credits (3)**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for C S graduate students. Taught with C S 506.

Prerequisite: At least C- in C S 370 or C S 371.

Learning Outcomes

1. Techniques used in three-dimensional graphics
2. Computer Graphics lightning and shading
3. Client-server graphics using WebGL
4. Geometric and Solid modeling
5. Computer Graphics implementation algorithms

C S 477. Digital Game Design**3 Credits (3)**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Not for C S graduate students. Taught with C S 517.

Prerequisite/Corequisite: C S 371.

Learning Outcomes

1. Describe, analyze, and/or critique games with a consistent vocabulary
2. Design, develop, and playtest games
3. Understand the formal systems of games
4. Communicate game designs through demonstrations and presentations

C S 478. Computer Security**3 Credits (3)**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Not for C S graduate students. Taught with C S 513.

Prerequisite: At least a C- in C S 272, C S 273 or consent of instructor.

Learning Outcomes

1. Describe fundamental concepts in security and privacy
2. Understand requirements of security in different contexts
3. Describe practical implementation challenges in security/privacy system design
4. Explain at a high-level symmetric and public key cryptography
5. Explain various access control mechanisms such as authentication, authorization
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for

C S 479. Special Topics**1-12 Credits**

Topics announced in the Schedule of Classes. May be repeated under different subtitles. Not for C S graduate students. May be repeated up to 12 credits.

C S 480. Linux System Administration**3 Credits (3)**

Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.

Learning Outcomes

1. Be able to properly set up, configure, and maintain a Linux-based set of networked computers with shared resources
2. Understand the significance of proper administration of systems and its impact on users, their data and computational resources, and the security of the overall installation

C S 481. Visual Programming**3 Credits (3)**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Not for C S graduate students. Taught with C S 518.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Develop software in graph-based visual environments
2. Understand flows of control in visual programming environments
3. Use signals, digital and analog, to drive software
4. Communicate software design and evaluation with presentations, demos, and reports

C S 482. Database Management Systems I**3 Credits (3)**

Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for C S graduate students. Taught with C S 502.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Utilize the basic concepts of relational database model
2. Utilize database query languages (e.g. SQL)
3. Identify data integrity and security requirements
4. Analyze, capture, and model user requirements for building database systems using conceptual models
5. Design and normalize relational schemas
6. Apply application development methods to implement a database system

C S 484. Computer Networks I**3 Credits (3)**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for C S graduate students. Taught with C S 504.

Prerequisite: At least a C- in C S 272 and CS 273.

Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models
2. Describe the purpose and concepts of each layer in the OSI and TCP/IP models
3. Describe IP as a particular network layer protocol
4. Describe TCP and UDP as particular transport layer protocols
5. Describe Ethernet (11) and WiFi (15) as particular data link layer protocols
6. Describe and analyze routing and routing issues
7. Describe and analyze data link layer switching
8. Describe the need for application protocols such as HTTP
9. Explain other network issues such as multicasting and audio/video data streaming 1
10. Implement socket-based network programs

C S 485. Human-Centered Computing**3 Credits (3)**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Not for C S graduate students. Taught with C S 515.

Prerequisite: At least C- in C S 371.

Learning Outcomes

1. Describe, analyze, and/or critique a device interface using a design vocabulary
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results
4. Communicate design and evaluation with presentations, demos, and reports
5. Implement a variety of interaction techniques

C S 486. Bioinformatics**3 Credits (3)**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics.

Not for C S graduate students. Taught with C S 516.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Explain the biology motivation of a bioinformatics question
2. Formulate a computational problem and its solution to address a molecular biology question
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly
4. Evaluate the performance of a bioinformatics algorithm on real data sets
5. Argue the correctness of a bioinformatics algorithm
6. Analyze the complexity of a bioinformatics algorithm

C S 487. Applied Machine Learning I**3 Credits (3)**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Not for Graduate Majors. Taught with: C S 519.

Prerequisite: At least a C- in C S 272, MATH 1511G; or consent of instructor.

Learning Outcomes

1. Implement and utilize different data processing techniques
2. Differentiate and assess several dimension reduction techniques
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages
4. Explain and demonstrate regression analysis
5. Describe and illustrate clustering approaches
6. Apply ensemble learning approaches
7. Implement several neural network classifiers, including deep learning models

C S 488. Introduction to Data Mining**3 Credits (3)**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Taught with C S 508.

Prerequisite: At least a C- in C S 272 and C S 278.

Learning Outcomes

1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection
3. Evaluate and compare the performance of different data mining / machine learning algorithms
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool

C S 489. Bioinformatics Programming**3 Credits (3)**

Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with C S 509. May be repeated up to 3 credits.

Learning Outcomes

1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data
2. Perform high-throughput data analysis with established R packages
3. Detect differential gene expression on RNA sequencing data
4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling)
5. Assess statistical significance of analytical results
6. Create automatic data analysis pipeline to link multiple software packages

C S 491. Parallel Programming**3 Credits (3)**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for C S graduate students. Taught with C S 521.

Prerequisite: At least a C- in C S 370 or consent of instructor.

Learning Outcomes

1. Describe existing parallel architectures including shared memory versus distributed memory platforms
2. Apply basic techniques for organizing parallel computations
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism
4. Explain alternative parallel techniques and hardware
5. Perform performance Analysis of different parallel programming techniques
6. Program shared memory machines using threads, processes, and the OpenMP library
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI)

C S 493. Algorithm Design and Implementation**3 Credits (3)**

This course introduces the basic knowledge of designing classical algorithms and implementing these algorithms using a programming language. In particular, the course teaches various data structures, including graphs and balanced binary search trees, and efficient schemes to implement these data structures. This course also teaches basic algorithm design techniques including divide-and-conquer, greedy scheme, and dynamic programming. This course covers graph algorithms, including graph traversals (depth-first search and breadth-first search), connectivity, shortest paths, and minimum spanning trees. Graduate standing. Not for CS students. Taught with C S 343.

Prerequisite: At least a C- in C S 272, or Consent of Instructor.

Learning Outcomes

1. Be able to use and implement sorting algorithms
2. Be able to design and implement graph algorithms
3. Be able to design and implement algorithms using the divide-and-conquer technique
4. Be able to design and implement algorithms using the greedy technique
5. Be able to design and implement algorithms using the dynamic programming technique
6. Be able to use and implement balanced search trees
7. Be able to use and implement hashing techniques
8. Be able to perform the run time analysis of basic algorithms using Big O notation

C S 494. Introduction to Smart Grids**3 Credits (3)**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with C S 514. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 and a C- in ENGR 230; or Consent of instructor.

Learning Outcomes

1. Get basic understanding of how conventional power system is operated and protected
2. Understand and use basic knowledge of communication techniques in smart grids
3. Understand and use basic knowledge for the coordination of the different units in smart grids
4. Understand and apply data mining techniques for protecting smart grids

C S 496. Cloud and Edge Computing**3 Credits (3)**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Not for graduate CS majors. Taught with: C S 522.

Prerequisite: At least a C- in C S 372; background in C S 484/C S 504 is preferred or consent of instructor.

Learning Outcomes

1. The emphasis of the course will be on the understanding the concepts and the engineering trade-offs involved in the design of cloud computing systems
2. Cloud deployment models, cloud service models (software-as-a-service, infrastructure-as-a-service, protocol-as-a-service), cloud architecture, cloud-edge security, service level agreements, and load balancing in cloud and datacenters
3. Learn about cloud computing, especially what are their fundamental components, how these components interact, and how the technology is evolving for the future (edge computing, cloudlets, mobile edge computing, etc.).

C S 502. Database Management Systems I**3 Credits (3)**

Database design and implementation; models of database management systems; privacy, security, protection, recovery; taught with C S 482; requires more advanced graduate work than C S 482. Students are expected to have solid knowledge of data structures and discrete mathematics.

Learning Outcomes

1. Utilize the basic concepts of relational database model
2. Utilize database query languages (e.g. SQL)
3. Identify data integrity and security requirements
4. Analyze, capture, and model user requirements for building database systems using conceptual models
5. Design and normalize relational schemas
6. Apply application development methods to implement a database system

C S 504. Computer Networks I**3 Credits (3)**

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; taught with C S 484; requires more advanced graduate work than C S 484. Students are expected to have solid knowledge of data structures, machine-level programming. Knowledge of statistics (at the level of MATH 371 or MATH 470) is recommended.

Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models
2. Describe the purpose and concepts of each layer in the OSI and TCP/IP models
3. Describe IP as a particular network layer protocol
4. Describe TCP and UDP as particular transport layer protocols
5. Describe Ethernet (802-11) and WiFi (802-15) as particular data link layer protocols
6. Describe and analyze routing and routing issues
7. Describe and analyze data link layer switching
8. Describe the need for application protocols such as HTTP
9. Explain other network issues such as multicasting and audio/video data streaming
10. Implement socket-based network programs

C S 505. Artificial Intelligence I**3 Credits (3)**

Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; taught with C S 475; requires more advanced graduate work than C S 475. Students are expected to have strong knowledge of algorithms and data structures (at the level of C S 372).

Learning Outcomes

1. Use various search algorithms commonly used in problem-solving
2. Use methods for solving constraint satisfaction problems
3. Use propositional and first-order logic to represent knowledge
4. Use logical inference methods to derive conclusions from a knowledge base
5. Use adversarial search for game-playing agents
6. Analyze the different search strategies
7. Design and Implement heuristic search for problem-solving

C S 506. Computer Graphics I**3 Credits (3)**

Languages, programming, devices, and data structures for representation and interactive display of complex objects. Taught with C S 476. Requires more advanced graduate work than C S 476. Students are expected to have knowledge of compilers design and software engineering equivalent to C S 370 and C S 371.

Learning Outcomes

1. Techniques used in three-dimensional graphics
2. Computer Graphics lightning and shading
3. Client-server graphics using WebGL
4. Geometric and Solid modeling
5. Computer Graphics implementation algorithms

C S 508. Introduction to Data Mining**3 Credits (3)**

Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Students are expected to have a preparation in Discrete Mathematics and Data Structures equivalent to C S 272 and C S 278. Requires more advanced graduate work than C S 488. Taught with: C S 488.

Learning Outcomes

1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection
3. Evaluate and compare the performance of different data mining / machine learning algorithms
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool

C S 509. Bioinformatics Programming**3 Credits (3)**

Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with C S 489. Requires more advanced graduate work than C S 489.

Learning Outcomes

1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data
2. Perform high-throughput data analysis with established R packages
3. Detect differential gene expression on RNA sequencing data
4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling)
5. Assess statistical significance of analytical results
6. Create automatic data analysis pipeline to link multiple software packages

C S 510. Automata, Languages, Computability**3 Credits (3)**

Regular and context-free languages, pushdown and finite-state automata, Turing machines, models of computation, halting problems. Students are expected to have knowledge of algorithms equivalent to C S 372. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the language accepted by an automaton or generated by a regular expression or a context-free grammar
2. Design automata, regular expressions and context-free grammars accepting or generating a certain language
3. Prove properties of languages, grammars, and automata with formal mathematical methods
4. Convert between equivalent deterministic and non-deterministic finite automata, and regular expressions
5. Convert between equivalent context-free grammars and pushdown automata
6. Define Turing machines performing simple tasks

C S 513. Computer Security**3 Credits (3)**

Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Taught with C S 478. Requires more advanced graduate work than C S 478. Recommended knowledge of materials in C S 272. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 273 or consent of instructor.

Learning Outcomes

1. Describe fundamental concepts in security and privacy
2. Understand requirements of security in different contexts
3. Describe practical implementation challenges in security/privacy system design
4. Explain at a high-level symmetric and public key cryptography
5. Explain various access control mechanisms such as authentication, authorization
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for

C S 514. Introduction to Smart Grids**3 Credits (3)**

This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with C S 494. Requires more advanced work than C S 494. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 and a C- in ENGR 230; or Consent of instructor.

Learning Outcomes

1. Get basic understanding of how conventional power system is operated and protected
2. Understand and use basic knowledge of communication techniques in smart grids
3. Understand and use basic knowledge for the coordination of the different units in smart grids
4. Understand and apply data mining techniques for protecting smart grids

C S 515. Human-Centered Computing**3 Credits (3)**

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Taught with C S 485. Requires more advanced graduate work than C S 485 with an emphasis on studying recent research in human-computer interaction. Students are expected to have knowledge of software engineering equivalent to C S 371.

Learning Outcomes

1. Describe, analyze, and/or critique a device interface using a design vocabulary
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results
4. Communicate design and evaluation with presentations, demos, and reports
5. Implement a variety of interaction techniques

C S 516. Bioinformatics**3 Credits (3)**

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; taught with C S 486; requires more advanced graduate work than C S 486. Students are expected to have a knowledge of algorithms and data structures equivalent to C S 372 or exposure to Biology (equivalent to BIOL 2310 or BIOL 311).

Learning Outcomes

1. Explain the biology motivation of a bioinformatics question
2. Formulate a computational problem and its solution to address a molecular biology question
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly
4. Evaluate the performance of a bioinformatics algorithm on real data sets
5. Argue the correctness of a bioinformatics algorithm
6. Analyze the complexity of a bioinformatics algorithm

C S 517. Digital Game Design**3 Credits (3)**

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Taught with C S 477. Requires more advanced graduate work than C S 477 with deeper attention to a team game project.

Learning Outcomes

1. Describe, analyze, and/or critique games with a consistent vocabulary
2. Design, develop, and playtest games
3. Understand the formal systems of games
4. Communicate game designs through demonstrations and presentations

C S 518. Visual Programming**3 Credits (3)**

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Students must be in graduate standing to enroll. Taught with C S 481. Requires more advanced graduate work than C S 481.

Learning Outcomes

1. Develop software in graph-based visual environments
2. Understand flows of control in visual programming environments
3. Use signals, digital and analog, to drive software
4. Communicate software design and evaluation with presentations, demos, and reports

C S 519. Applied Machine Learning I**3 Credits (3)**

An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Taught with: C S 487.

Requires more advanced graduate work than C S 487.

Learning Outcomes

1. Implement and utilize different data processing techniques
2. Differentiate and assess several dimension reduction techniques
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages
4. Explain and demonstrate regression analysis
5. Describe and illustrate clustering approaches
6. Apply ensemble learning approaches
7. Implement several neural network classifiers, including deep learning models

C S 521. Parallel Programming**3 Credits (3)**

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; taught with C S 491; requires more advanced graduate work than C S 491. Students are expected to have knowledge of programming and machine organization equivalent to C S 271 and C S 273.

Learning Outcomes

1. Describe existing parallel architectures including shared memory versus distributed memory platforms
2. Apply basic techniques for organizing parallel computations
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism
4. Explain alternative parallel techniques and hardware
5. Perform performance Analysis of different parallel programming techniques
6. Program shared memory machines using threads, processes, and the OpenMP library
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI)

C S 522. Cloud and Edge Computing**3 Credits (3)**

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Might have additional requirements for graduate students. To enroll in this course a background in C S 484/C S 504 is preferred or have consent from the instructor. Taught with: C S 496. Requires more advanced graduate work than C S 496.

Learning Outcomes

1. The emphasis of the course will be on the understanding the concepts and the engineering trade-offs involved in the design of cloud computing systems
2. Cloud deployment models, cloud service models (software-as-a-service, infrastructure-as-a-service, protocol-as-a-service), cloud architecture, cloud-edge security, service level agreements, and load balancing in cloud and datacenters
3. Learn about cloud computing, especially what are their fundamental components, how these components interact, and how the technology is evolving for the future (edge computing, cloudlets, mobile edge computing, etc.).

C S 525. Introduction to Cryptography**3 Credits (3)**

The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Consent of Instructor required. Taught with: C S 380. Requires more advanced graduate work than C S 380.

Prerequisite: C S 278 (or equivalent) with a C or better.

Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of crypto primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions;
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

C S 531. Principles of Virtual Reality**3 Credits (3)**

This course is an introduction to building systems and doing research in / on virtual reality. We cover system design, development, and evaluation, with an emphasis on recent research in the space. We cover a range of methods, qualitative and quantitative, in order to develop insights into effective VR designs. Students in this class will develop a foundation in VR development; learn about current topics in VR; and design, develop, evaluate, and report on a VR system. Taught with C S 381. Requires more advanced graduate work than C S 381.

Prerequisite: C S 485 or Consent of Instructor.

Learning Outcomes

1. Design and develop systems in virtual reality.
2. Understand the variety of development techniques in VR.
3. Understand the state-of-the-art in VR systems.
4. Communicate understanding of people, designs, and evaluations through presentations, demos, and/or reports.

C S 532. Modern Web Technologies**3 Credits (3)**

In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and responsive web design. Finally, we cover advanced topics including the design and implementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Consent of Instructor required. Taught with: C S 382. Requires more advanced graduate work than C S 382.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

C S 533. Introduction to Deep Learning**3 Credits (3)**

The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught with C S 383. Requires more advanced graduate work than C S 383. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

C S 534. Graph Data Mining**3 Credits (3)**

The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining. Taught with C S 384. Requires more advanced graduate work than C S 384. May be repeated up to 3 credits.

Prerequisite: At least a C- in C S 272 or C S 153, and C S 278, or consent of instructor.

Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining.
2. Graph representation and graph querying using graph manipulating toolbox/library.
3. Use random and scale-free graph models to generate graphs and visualize complex network properties.
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization.
5. Implement graph representation learning algorithms and graph neural network.
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

C S 570. Analysis of Algorithms**3 Credits (3)**

Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

Learning Outcomes

1. Prove algorithm correctness by loop-invariant
2. Prove an algorithm to be incorrect by counterexamples
3. Develop efficient divide-and-conquer algorithms
4. Design and analyze binary search tree algorithms
5. Construct dynamic programming solutions
6. Prove the correctness of dynamic programming solutions by contraposition
7. Traverse graphs efficiently
8. Find paths in graphs efficiently
9. Determine if a problem is NP-Complete or NP-Hard 1
10. Basic concepts of quantum computing

C S 573. Architectural Concepts II**3 Credits (3)**

Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474. Crosslisted with: E E 564.

Learning Outcomes

1. Be able to explain the features in a modern multicore CPU architecture
2. Be able to utilize hardware counter features of a CPU in performance evaluation
3. Be able to explain the architecture of GPUs and their capabilities and drawbacks
4. Be able to evaluate novel cutting-edge architectural features and designs
5. Be able to present a research paper to an advanced audience

C S 574. Operating Systems II**3 Credits (3)**

Advanced topics related to operating system principles, guided by the current literature. Students are expected to have knowledge of computer architectures and operating systems equivalent to C S 473 and C S 474.

Learning Outcomes

1. Further an understanding of the principles of operating systems.
2. Develop insight into process management and scheduling issues.
3. Understand memory management operation.
4. Develop an understanding of file system implementation and of multiple levels of hardware support and management.
5. Develop a deep understanding of the concepts of cooperating processes, including communication, synchronization, and deadlock (detection and avoidance).
6. Be able to evaluate operating system features.
7. Develop an understanding of the distributed operating system environment.

C S 575. Artificial Intelligence II**3 Credits (3)**

Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Students are expected to have knowledge of artificial intelligence equivalent to C S 475.

Learning Outcomes

1. Apply selected planning algorithms in solving problems
2. Identify problems where knowledge representation and reasoning techniques are applicable
3. Be able to apply answer set programming in problem solving
4. Be aware of various advanced research topics in Artificial Intelligence

C S 579. Special Topics**1-6 Credits**

Topic announced in the Schedule of Classes.

C S 581. Advanced Software Engineering**3 Credits (3)**

Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures, templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Students are expected to have knowledge of software engineering equivalent to C S 371.

Learning Outcomes

1. Be able to explain modern software development process ideas
2. Be able to apply agile software development techniques in a project
3. Be able to specify, design, and develop a complex software system in a team
4. Be able to properly utilize both black box and white box testing techniques
5. Be able to explain how unsound and incomplete formal methods can aid in system verification and validation
6. Be able to utilize sound and complete formal methods to prove properties of a system

C S 582. Database Management Systems II**3 Credits (3)**

Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Students are expected to have knowledge of data base management systems equivalent to C S 482.

Learning Outcomes

1. Analyze storage and file structures of an RDBMS
2. Analyze and apply indexing techniques of an RDBMS
3. Analyze query evaluation approaches of an RDBMS
4. Analyze the mechanisms of transaction management in an RDBMS

C S 583. Advanced Cryptography**3 Credits (3)**

This is an advanced cryptography course, which will cover cryptographic protocols such as zero-knowledge proofs, secret sharing schemes, secure two-party/multi-party computation, and more. We will also briefly cover real-world applications of these protocols. Students will also be exposed to recent research topics in cryptography (exact topics might vary every offering).

Prerequisite: At least a C- in C S 465.

Learning Outcomes

1. Understand advanced crypto primitives such as zero-knowledge proofs, fair exchange, verifiable encryption, k-of-n secret sharing, etc., and their security properties
2. Understand the theoretical underpinnings of protocols such as attribute-based encryption/signatures, two-party/multi-party secure computation
3. Given a real-world situation, be able to think of what protocols are best applicable in the scenario, and be able to reason about their security

C S 584. Computer Networks II**3 Credits (3)**

Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Students are expected to have knowledge of computer networks equivalent to C S 484, and of statistics equivalent to MATH 371 or MATH 470.

Learning Outcomes

1. Understand design of link layer protocols.
2. Understand challenges and implementations for multimedia streaming.
3. Be able to use basic security constructs in the networking context.
4. Understand the concepts of edge and cloud computing
5. Understand the concepts and challenges of Internet of Things
6. Learn concepts of distributed networking
7. Learn and evaluate future internet architectures

C S 586. Algorithms in Systems Biology**3 Credits (3)**

The course will introduce important algorithms and computational models used in systems biology to study molecular mechanisms for cellular dynamics, processes, and systems. Cellular processes, such as metabolism and signal transduction, are studied as systems and networks quantitatively from high throughput molecular measurements. The topics include molecular biological systems, network alignment, model simulation, network inference, model optimization, and hybrid models. Students will be able to construct models and analyze their properties in the context of molecular biological systems. Students are expected to have knowledge of algorithms and data structures equivalent to C S 372.

Learning Outcomes

1. Create mathematical representation of biological systems
2. Infer biological network topology from observed omics data set
3. Simulate the behavior of a biological system using a mathematical model
4. Characterize behaviors of biological systems
5. Estimate parameters in a biological system model
6. Validate a model's statistical relevance given observed data

C S 589. Special Research Problems**1-6 Credits (1-6)**

Faculty-supervised investigation, to culminate in a written report. Maximally 6 credits can be applied to the student program of study. Written agreement with faculty supervisor is the required consent. May be repeated up to 18 credits.

Learning Outcomes

1. Research experience for graduate student.

C S 598. Master's Project**1-6 Credits**

Project-oriented capstone course to be completed by M.S. students under supervision of their advisor. Maximum of 6 credits may be applied toward M.S. degree. Restricted to C S majors.

Prerequisite: written agreement with instructor.

C S 599. Master's Thesis**1-6 Credits (1-6)**

Thesis to be developed by M.S. Students under supervision of their advisor. May be repeated for a maximum of 6 credits. Restricted to majors.

Prerequisite: consent of instructor.

C S 600. Pre-dissertation Research**1-15 Credits**

Pre-dissertation research.

C S 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

CAST-CHILD ADVOCACY STUDIES

CAST 1110. Introduction to Child Advocacy**3 Credits (3)**

This is the introductory course for child advocacy studies (CAST). It covers different models for understanding child maltreatment, types and indicators of child maltreatment, controversial topics in the field, and issues and laws related to child maltreatment in various countries around the world. Students will develop critical thinking and analytical skills in assessing child maltreatment. Restricted to Dona Ana campus only.

Learning Outcomes

1. Demonstrate how to apply a model of critical thinking and analysis to child maltreatment issues.
2. Describe historical trends in child maltreatment and child advocacy.
3. Compare and contrast theories and models of child maltreatment.
4. Compare and contrast the indicators and consequences of different types of maltreatment.
5. Discuss cultural issues related to assessing and working with families.

**CAST 2110. Professional and Systems Responses to Child Maltreatment
3 Credits (3)**

Course examines the professionals and systems that respond to allegations of child abuse and neglect. Includes the differences between civil and criminal proceedings; components of a court-worthy child abuse and neglect investigation; basic child forensic interviewing; an overview of child sex offenders; and current research and controversial issues affecting the field. Restricted to Dona Ana campus only.

Prerequisite(s): CAST 1110.

Learning Outcomes

1. Define neglect, abuse, and violence including psychological, emotional, and spiritual maltreatment.
2. Describe the interpersonal dynamic of violence and abuse, and the varied and changing types of violence and abuse.
3. Identify risk factors for various categories of child abuse in the general population and identify high-risk population.
4. Describe the physical and behavioral health effects of violence, neglect, and abuse, including mental health impacts.
5. Identify the barriers to help-seeking for victimized children.
6. Describe models for intervention and prevention of child maltreatment.
7. Discuss various factors that affect children's motivation for disclosure.
8. Discuss how values, attitudes, beliefs, and experiences related to child maltreatment may effect interaction with children and families
9. Describe best practice in the investigation of maltreatment reports. 1
10. Identify methods utilized to evaluate the credibility of witnesses. 1
11. Describe the processes of collecting corroborative evidence beyond "hard science" items such as DNA. 1
12. Identify strategies for engaging non offending caregivers in providing appropriate support for children who have disclosed maltreatment. 1
13. Identify commonly available community resources that may ensure a safe environment for children disclosing maltreatment. 1
14. Describe strategies for engaging appropriate professionals to ensure children's' well-being following a disclosure of maltreatment. 1
15. Discuss cultural or developmental factors that may impact the well-being of children reporting maltreatment. 1
16. Discuss the scope of confidentiality in child maltreatment cases. 1
17. Describe why all children's safety should be the priority during an investigation. 1
18. Describe the typology of sex offenders in child maltreatment cases. 1
19. Define the grooming process used by sex offenders. 2
20. Discuss circumstances that may cause children to recant the disclosure of child maltreatment. 2
21. Discuss how values, attitudes, beliefs, and experiences related to child maltreatment may effect interaction with children and families. 2
22. Describe legislative and agency mandates of common MDT team members. 2
23. Discuss the scope of authority and resources among MDT members. 2
24. Discuss the importance of maintaining appropriate professional boundaries between team members. 2
25. Identify the kinds of information that must be shared within the MDT team during an investigation or litigation. 2
26. Identify common educational resources needed by MDTs. 2
27. Describe ways to engage community stakeholders in preventing, investigating, and intervening in cases of child maltreatment. 2
28. Accurately describe the steps in the process following a report of child maltreatment. 2
29. Describe common questions asked by children and families during a

**CAST 2120. Prevention, Trauma Informed Treatment and Advocacy
3 Credits (3)**

The purpose of this course is to prepare students to recognize the effects of child maltreatment and apply interventions strategies for children and their families. Multidisciplinary approaches to prevention, advocacy and treatment of child maltreatment survivors will be presented and discussed. Topics include violence prevention research, interdisciplinary family programs, how to advocate for survivors of child abuse, case management, working with families, mental health service and controversial issues.

Prerequisite(s): CAST 1110.

Learning Outcomes

1. Be able to create goals and identify services needed by maltreating families.
2. Understand the development of psychopathology in the child related to maltreatment
3. Understand the documented effects of maltreatment such as depression, anxiety, sexualized behavior, neurobiological, suicide, and damaged ego development/ sense of self
4. Describe interdisciplinary family intervention programs such as in-home parenting programs, Stay Safe program, Incredible Years, Project Safe Care, ECFE, etc.
5. Explain mental health assessment, diagnosis, treatment, and availability of services for the survivor, the family and the offender.
6. Understand PTSD, reactive attachment disorder and other trauma responses; assessment and treatment
7. Describe issues for adolescent and adult survivors of maltreatment such as eating disorders, low self-esteem and personality disorders.
8. Identify professional issues related to maltreatment such as how to approach families and an awareness of the effect of working with families on the professional.
9. Discuss the role of interdisciplinary approaches to child maltreatment intervention in planning for the future and advocating for the rights of children 1
10. Explain violence prevention research, strategies, and programs 1
11. Understand how battering, chemical dependency/maltreatment, mental illness, chronic illnesses, disabilities, and other family stressors influence intervention with survivors, their families and the offender 1
12. Explain how issues of race, class, sexual orientation, religion, gender and social justice can influence professional practice with children who have been maltreated 1
13. Explain the role of the child advocate in addressing social justice issues associated with intervention and prevention of child maltreatment, and in promoting social change that will result in fewer incidents of child maltreatment.

CCDE-DEVELOPMENTAL ENGLISH**CCDE 105 N. Effective Communication Skills****4 Credits (3+2P)**

Instruction and practice in basic communication, to include written and oral presentations. Develops thinking, writing, speaking, reading, and listening skills necessary for successful entry to college and university classes. Provides laboratory. RR applicable.

CCDE 110 N. General Composition**4 Credits (3+2P)**

Instruction and practice in preparation for college-level writing. Students will develop and write short essays. Provides laboratory. May be repeated up to 4 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

CCDM-DEVELOPMENTAL MATHEMATICS

CCDM 100 N. Mathematics Preparation for College Success**1-4 Credits**

Mathematics skills course designed for college students with math skills insufficient for success in CCDM 103N. May be repeated for a maximum of 4 credits. RR applicable.

CCDM 103 N. Pre-Algebra**4 Credits (3+2P)**

Fundamental mathematics operations and arithmetic computations. Introduction to algebra and applied geometry. Provides laboratory and individualized instruction. RR applicable.

CCDM 105 N. Mathematics Preparation and Pre-Algebra**5 Credits (4+2P)**

A total immersion course that combines CCDM 100N and CCDM 103N using tutorials, manipulatives, and classroom instruction. Completion of this class is equivalent to the completion of CCDM 100N and CCDM 103N. Restricted to: Community Colleges only.

CCDM 112 N. Developmental Algebra I**4 Credits (3+2P)**

Fundamental algebra operations, algebraic expressions, solving linear equations, systems of equations and applications of linear equations. Introduction to exponents and polynomials. Provides laboratory instruction. Completion of CCDM 112N and CCDM 113N is equivalent to completion of CCDM 114N. Graded: Traditional with RR. Traditional Grading with RR. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of C or better in CCDM 103N or CCDM 105N or adequate placement score.

CCDM 113 N. Developmental Algebra II**4 Credits (3+2P)**

Fundamental algebra operations, polynomials, factoring, solving quadratics by factoring, rational expressions, exponents and radical expressions (continuation of CCDM 112N). Provides laboratory instruction. Completion of CCDM 112N and CCDM 113N is equivalent to completion of CCDM 114N. Graded: Traditional with RR. Restricted to: Community Colleges only.

Prerequisite(s): Grade of C or better in CCDM 112N or consent of instructor.

CCDM 114 N. Algebra Skills**4 Credits (3+2P)**

Fundamental algebra operations: algebraic expressions, solving linear and quadratic equations, factoring, radicals, exponents. Provides laboratory and individualized instruction. Completion of CCDM 114N meets basic skills requirement. Graded: Traditional with RR. Traditional Grading with RR. Restricted to Community Colleges campuses only.

Prerequisite(s): C or better in CCDM 103N or CCDM 105N or adequate placement score.

CCDR-DEVELOPMENTAL READING

CCDR 103 N. Comprehensive Reading Development**4 Credits (3+2P)**

Provides integration of basic reading skills, including vocabulary development, text comprehension, and critical reading skills. Course earns institutional credit but will not count towards degree requirements. May be repeated up to 4 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

Prerequisite(s): Appropriate placement score.

CCDR 105 N. Fundamentals of Academic Reading.**3 Credits (2+2P)**

Fundamentals of academic reading skills. Emphasis on vocabulary development and text comprehension through literature based instruction. Course earns institutional credit but will not count towards degree requirements. Graded: Traditional with RR. May be repeated up to 3 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

Prerequisite(s): Appropriate placement score.

CCDR 110 N. Effective College Reading**3 Credits (2+2P)**

Provides a variety of strategies for effective reading and studying at the college level. Emphasis on reading across disciplines. Course earns institutional credit but will not count towards degree requirements. Graded: Traditional with RR. May be repeated up to 3 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.

Prerequisite(s): Appropriate placement score.

CCDS-DEVELOPMENTAL SKILLS

CCDS 109 N. Study Skills for Reading**1-3 Credits**

Individualized reading skill strategies necessary for success in college classroom. May be repeated for a maximum of 3 credits. Graded traditional or S/U.

CCDS 111 N. Study Skills for Math**1-3 Credits**

Individualized study skill strategies necessary for success in the math classroom. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

CCDS 113 N. Study Skills for English**1-3 Credits**

Individualized study skill strategies necessary for success in the composition classroom. May be repeated for a maximum of 3 credits.

CCDS 119 N. College Reading and Writing**4 Credits (4)**

Instruction and practice in preparation for college-level reading and writing. Students will develop and write essays, work on the writing process, and learn to read and analyze college-level texts. Traditional Grading with RR.

Prerequisite(s): Appropriate placement test score.

Learning Outcomes

1. Practice the reading and writing process through activities such as pre-reading/writing, annotating, drafting, summarizing, peer reviewing, discussing, revising, proofreading, journaling, researching, and citing.
2. Infer and interpret meanings in various texts through activities such as summarizing, annotating, journaling, reflecting, and textual analysis.

CCST-CHICANA/O STUDIES

CCST 2110G. Introduction to Chicana and Chicano Studies

3 Credits (3)

An introductory survey of the Mexican American experience in the United States, with special reference to New Mexico. The course includes exploration of historical, political, social and cultural dimensions. NMSU Specific It seeks to review the historical causes and consequences of the formation of the Chicano identity and to understand its relation to the development of the Chicano experience as a distinct culture. The course explores the social and political impact that Chicana/o thought and theory has had on the United States over time, specifically developing concepts related to identity, community, social movements, and social justice. Ultimately, the course will facilitate understanding the historical ways in which Chicana/os have negotiated the pressures of their surroundings and in the process shaped or redefined American conceptions of identity, race, gender, sexuality, ethnicity, education, protest, and resistance.

Learning Outcomes

1. Apply various transdisciplinary perspectives and processes to understand humanist expressions through a variety of creative productions.
2. Assess and apply social, historical, economic and cultural perspectives as they impact diverse populations over a period of time.
3. Explain the ways in which narratives help people understand one another more clearly and profoundly across ethnic and cultural groups.
4. Design projects that foster and increase a full understanding of a subject in order to promote change in their own and listeners' attitudes, values, beliefs, or behaviors.
5. Apply qualitative and numerical data to explain diverse human actions in an everyday context of life.

CCST 3110. Chicana/o History

3 Credits (3)

This course is an exploration and discuss the history of Mexican Americans in the U.S., with emphasis on their contributions to society and the political, economic and cultural forces that exemplify their experiences as a population. Beginning in 1492, at the onset of European "contact" with indigenous people living in what is now called Mexico, students will study the early beginnings of Mexicans as a mestizo (mixed) race and follow this group on a rough timeline through the present. Films, music, images and poetry are included to supplement lecture material. With special attention to New Mexico and the borderlands specifically, students will endeavor to make relevant, contemporary connections to the material. Additionally, the course will contextualize this history of a population and experiences within the establishment of Chicana/o Studies as an evolving discipline.

Learning Outcomes

1. Summarize the major economic, political, social and cultural histories defining and effected by the Mexican American population.
2. Gain understanding of how these histories evolved in political solidarity with other minority populations in the United States.
3. Understand the multidisciplinary diversity and intellectual rigor that effected and currently compose Chicana/o Studies as an academic discipline.
4. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
5. Interpret, understand, and engage texts within cultural, social and historical contexts.
6. Gather, analyze, and evaluate information from a variety of sources.
7. Compose texts in a variety of media formats.

CCST 3120V. Chicana/o Genders and Sexualities

3 Credits (3)

This survey course introduces students to Chicana genders and sexual identities and representations as socially and culturally constructed in transnational Latinx communities and contexts. Through a lens of Chicana feminist and queer theories, students will gain familiarity with gender- and sexuality-related stereotypes and cultural expectations, as well as the histories of individual and group resistance to these norms. Course materials will highlight the revolutionary challenges to limitations and contributions to social, political, and cultural change made by queer Chicana individuals and groups, women, and men resisting confining constructions of masculinity. This course will be both reading and writing intensive.

Learning Outcomes

1. Explain the multidisciplinary diversity and intellectual rigor that compose Chicana feminist and queer theoretical traditions
2. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions
3. Interpret, understand, and engage texts within cultural, social and historical contexts
4. Gather, analyze, and evaluate information from a variety of sources
5. Compose texts in a variety of media formats.

CCST 3130. Chicana/o Education**3 Credits (3)**

This course deconstructs the history of education through the lens of culture and race. Using a framework of intersectionality, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today. Additionally, this course will particularly foreground Latinx and Chicanx resistance and revolution in the realm of education and what this history and activism teaches us about our own identity, worldviews, environment, and ways of understanding in the contexts of both informal and formal processes and experiences of education.

Learning Outcomes

1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall, especially for Latinx and Chicanx students.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

CEPY-COUNSELING & EDUCATIONAL PSYCHOLOGY

CEPY 1120G. Human Growth and Behavior**3 Credits (3)**

Introduction to the principles of human growth and development throughout the life span. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate an understanding of the scientific study of processes of change and stability throughout the human lifespan (i.e. Human Development).
2. Students will demonstrate a familiarity with the generally recognized stages of human development from conception to death.
3. Students will be able to demonstrate understanding of the normal and exceptional patterns of human development.
4. Students will be able to demonstrate understanding of recent research development regarding the identified stages of human development as they relate to gender and multicultural issues

CEPY 1150. Career Excellence**1 Credit (1)**

Professional career curriculum to assist students in developing an understanding and ability to articulate who they are as emerging professionals through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting. Course does not count toward CEP minor. Spring only course offering. Restricted to: College of Education Majors only majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Demonstrate an understanding of the relationship between academic and professional career success.
2. Express a familiarity with professionalism and career culture and communicate a comprehension of various professional career skills.
3. Apply material learned to other aspects to professional excellence.
4. Develop a career life plan that will highlight goals, taking into account life circumstances.
5. Become competent in appropriate professional communication.

CEPY 1160. Academic Excellence**1 Credit (1)**

The course is designed to provide you students with a foundation in their personal academic process. The course will assist students in developing an understanding and ability to articulate who they are as beginning college students through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting. Topics discussed will include time management, study skills, test taking skills, stress management, motivational and academic discipline skills, interpersonal skills and college survival skills. We intend for this to be a supportive, respectful and collaborative environment where everyone can learn and grow. Fall only course offering. Restricted to: College of Education majors.

Learning Outcomes

1. Students will be able to demonstrate an understanding of the relationship between time management and academic success.
2. Students will be able to express a familiarity with college culture.
3. Students will be able to communicate a comprehension of study skills and test taking strategies.
4. Students will be able to apply material learned to other aspects to enhance academic excellence.
5. Students will be able to develop an academic life plan that will highlight goals, taking into account life circumstances.
6. Become competent in appropriate academic communication.

CEPY 2110. Learning in the Classroom**3 Credits (3)**

This class introduces you to the basic principles of learning, including cognition, motivation, and assessment. You will examine the relationships between theory, research, and practice in learning, memory, child development, motivation, and educational assessment for the school setting. This course will provide the student with concepts and principles of educational psychology that will form a framework for thinking about learning and instruction and how theories of learning are connected to classroom situations. May be repeated up to 3 credits.

Learning Outcomes

1. Define learning and compare and contrast the factors that cognitive, behavioral, and humanistic theories believed to influence the learning process, giving specific examples of how these principles could be used in the classroom.
2. Observe and reflect upon the teaching learning processes in economically, socially, culturally and educationally diverse classroom populations in order to develop a current understanding of students and families in public and private school.
3. Discuss how theories of information processing and cognitive theories of learning can impact memory, study strategies, and how certain teaching techniques can help students learn.
4. Compare teacher-centered and student-centered approaches to learning, and to identify a positive learning environment.
5. Identify various methods to motivate students and create effective learning environments.
6. Use major concepts of child and adolescent development, human learning, and social and cultural influences in planning and implementing classroom instruction, strategies, and management.
7. Evaluate the best means of accommodating instruction to meet individual needs and differences.
8. Students will examine how learning style, cultural and social issues and learning disabilities impact the learner's effectiveness in the classroom setting.
9. Explain different types of assessment used to assess learning and provide examples of effective assessment practices. 1
10. Discuss the relationship between motivation and classroom management

CEPY 2120. The Preschool Child**3 Credits (3)**

Survey of psychological development from conception to age five. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding of major theories of early childhood development
2. Demonstrate an understanding of recognized stages of human development from prenatal to preschool years
3. Explore cultural influences that may create variability in human development
4. Apply major theories to themselves and reflect on their early childhood development.

CEPY 2130. Adolescence - School Setting**3 Credits (3)**

This course is designed to present the student with an introduction to the area of adolescent development with an emphasis on the positive aspects of this life stage. Students will be encouraged to be reflective on the topics presented in class that will include issues on diversity, culture, health, and well-being, emerging adulthood and suggestions for improving the lives of adolescents. May be repeated up to 3 credits.

Learning Outcomes

1. Students will become knowledgeable about the historical background of adolescent development.
2. Students will become knowledgeable about the major theories related to adolescence.
3. Students will evaluate different developmental theories and their fit across cultures as you reflect on your personal experiences through discussions and videos you will watch.
4. Students will identify key developmental milestones, conflicts, and concepts of each chapter presented by utilizing critical thinking skills as you complete summary questions.
5. Students will define relevant terms, ideas, and concepts in the study of adolescent development through quizzes and homework assignments.

CEPY 2140. Explorations of Counseling & Community Psychology**3 Credits (3)**

An introduction and exploration of various career options and functions within the mental health disciplines to aid in professional development. Emphasis will be placed on depth and scope of the choices available including research, teaching, community work, public policy, and clinical work and prevention (e.g. counseling, psychotherapy, assessment, consultation). May be repeated up to 6 credits.

Learning Outcomes

1. Acquire knowledge of historical and contemporary issues which affect the provision of mental health services by members of diverse mental health disciplines including clinical, counseling, school, and community psychologists, clinical mental health counselors, and others.
2. Acquire knowledge pertaining to education and training requirements for various disciplines.
3. Acquire survey-level knowledge of psychological assessment, measurement, and treatment.
4. Acquire survey-level knowledge of various inquiry approaches applicable to research pertaining to mental health and well-being—both at the individual and community level.
5. Understand the mental health recovery model and explore the lived experiences of individuals with mental health problems in contemporary society.
6. Understand the principles of sensitivity and respect for diverse populations as integral to professional practice in diverse mental health disciplines and settings, including practice in educational and community settings.

CEPY 2140H. Exploration of CCP**3 Credits (3)**

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Taught with CEPY 2140 with differentiated instruction and/or independent project to be determined. Restricted to Las Cruces campus only.

Learning Outcomes

1. Demonstrating knowledge of the basic functions of careers in counseling, community and school psychology.
2. Establishing a familiarity with the educational requirements necessary for a career in counseling, community, and school psychology.
3. Acknowledging and enhancing sensitivity and respect for diverse populations in various counseling areas; including educational and community settings.
4. Beginning to develop the interpersonal skills needed to succeed in the counseling, community and school psychology professions.

CEPY 3110. Sex Roles in Education**3 Credits (3)**

Physiological, psychological, and political aspects of sex role socialization and the effects of these factors on personal development. May be repeated up to 3 credits.

CEPY 3210V. Human Relations Training**3 Credits (3)**

Gain skills, knowledge, and sensitivity for living and working with others. May be repeated up to 3 credits.

CEPY 4110V. Introduction to Counseling**3 Credits (3)**

Principles of counseling for nonmajors. May be repeated up to 3 credits.

CEPY 4120. Introduction of Mindfulness Practice**3 Credits (3)**

Students will learn about contemplative practices through learning and participation in various mindfulness practices. Engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning. May be repeated up to 3 credits.

CEPY 4130. Addictions Prevention and Recovery**3 Credits (3)**

Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. May be repeated up to 3 credits.

CEPY 4140. Family Guidance**3 Credits (3)**

Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems. May be repeated up to 3 credits.

Prerequisite: CEPY 1120G.

CEPY 4150. Psychology, Multiculturalism and Counseling**3 Credits (3)**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.

CEPY 4150H. Psych., Multiculturalism & Counseling**3 Credits (3)**

Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling. Taught with CEPY 4150. Differentiated instruction/independent project to be determined.

CEPY 4997. Independent Study**1-6 Credits (1-6)**

Individual study directed by consenting faculty. May be repeated up to 6 credits.

CEPY 4998. Internship in Counseling & Community Psychology**1-6 Credits (1-6)**

Students will explore in more depth the fields of counseling, community, and school psychology professions by completing an internship. Through the completion of the internship students will gain hands on work experience, enhance sensitivity for respect with working with diverse populations, and hone their interpersonal skills needed to succeed in the counseling, community, and school psychology professions. May be repeated up to 6 credits.

CEPY 5110. Introduction to Counseling**3 Credits (3)**

Overview of counseling theory, techniques, ethics, and professional issues. Same as CEPY 4110V. This course is open to all majors.

Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

CEPY 5120. Human Development**3 Credits (3)**

Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Non majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 5130. Multicultural Counseling**3 Credits (3)**

Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Awareness will be accomplished by assisting students in the exploration and identification of students' individual cultural assumptions (i.e. WORLDVIEW) in relation to people diverse from themselves. This will be accomplished via modeling, observations, readings, group processing and other experiential exercises.
2. Knowledge will be accomplished by exploring the question, "What is Multiculturalism" in its many forms, roles, and relationships. It will begin with the examination of the psychology of multiculturalism and the requirements of cultural competency in intercultural communications. In addition, a review of various theories of diversity (i.e. identity development, acculturation, worldview, bilingualism, and disability, to name a few) will be embedded in readings, assignments, and class discussion. Exploration of various diverse populations will also be integrated into this course.
3. Skills will focus on "How to" of multicultural competency and its practical applications to everyday interactions. Students will learn about basic issues related to assumptions that are used in communication intra-cultural and intercultural interactions.

CEPY 5150. The Art & Science of Mindfulness**1-3 Credits (1-3)**

In this course students will learn about contemplative practices by learning about and participating in various mindfulness practices for self-care and to increase well-being. Students will learn about psychological theories and research that support the use of mindfulness in helping others increase their well-being. Students will learn how to teach mindfulness to others. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. To learn about mindfulness practices for self-care.
2. To incorporate mindfulness practices into daily life.
3. To learn how mindfulness practices may increase well-being.
4. To increase students' knowledge of mindfulness theory and research.
5. To develop skills to teach mindfulness to others.

CEPY 5160. Organization and Administration of School Counseling Services**3 Credits (3)**

Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the history of school guidance/counseling and apply that knowledge to assess current trends and the quality of services provided in counseling programs with respect to the changing needs of today's diverse systems.
2. Students will learn to develop and administer a school guidance/counseling program according to professional and ethical standards developed by The American School Counseling Association's (ASCA) National Model of School Counseling.
3. Students will be introduced to a variety of technology-based career development applications, educational resources and research to promote academic advancement and social-emotional well-being. Additionally, students will explore the use of technology designed to implement, monitor, and evaluate a comprehensive school counseling program.
4. Students will gain an understanding of effective teamwork within a school setting including theories, models, and processes of consultation and change with teachers, administrators, and other school personnel. Students will explore strategies and methods of advocacy with families and communities designed to empower them to address issues of social justice within an educational system.
5. Students will build a framework for facilitating school-level individual and group counseling services. They will analyze and interpret trends in academic achievement by understanding the cultural context of the school environment as it relates to groups of students and to institutional functioning.

CEPY 5170. Professional Issues in Mental Health Counseling
3 Credits (3)

History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students should understand and demonstrate ethical decision-making processes and resources.
2. Students should demonstrate understanding of the expectations and requirements of their new professional identity.
3. Students should demonstrate knowledge of history and philosophy of the counseling profession and its specialty areas.
4. Students should demonstrate understanding of the multiple professional roles and functions of counselors across specialty areas, and their relationships with human service and integrated behavioral health care systems, including inter-agency and inter-organizational collaboration and consultation.
5. Students should demonstrate knowledge and understanding of counselors' roles and responsibilities as members of interdisciplinary community outreach and emergency management response teams.
6. Students should demonstrate knowledge and understanding of the role and process of the professional counselor advocating on behalf of the profession; advocacy processes needed to address institutional and social barriers that impede access, equity, and success for clients.

CEPY 5180. Addictions Counseling
3 Credits (3)

Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize the potential for substance use disorders to mimic and coexist with a variety of medical and psychological disorders.
2. Know the disease concept and etiology of addiction and co-occurring disorders.
3. Identify standard screening and assessment instruments for substance use disorders and process addictions.

CEPY 5210. Research Methods
3 Credits (3)

Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to critically evaluate research relevant to the practice of clinical mental health counseling.
2. Become knowledgeable of models of program evaluation for clinical mental health programs.
3. Demonstrate knowledge of evidence-based treatments and basic strategies for evaluating counseling outcomes in clinical mental health counseling.
4. Apply relevant research findings to inform the practice of clinical mental health counseling.
5. Develop measurable outcomes for clinical mental health counseling programs, interventions, and treatments.
6. Analyze and use data to increase the effectiveness of clinical mental health counseling interventions and programs.

CEPY 5220. Testing, Assessment, and Psychometric Theory
3 Credits (3)

Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Basic concepts of standardized and non-standardized testing and other assessment techniques, including norm-referenced and criterion-referenced assessment, environmental assessment, performance assessment, individual and group test and inventory methods, psychological testing, and behavioral observations (II-G-seven-b)
2. Statistical concepts, including scales of measurement, measures of central tendency, indices of variability, shapes and types of distributions, and correlations (II-G-seven-c)c.Reliability (i.e., theory of measurement error, models of reliability, and the use of reliability information) (II-G-seven-d)
3. Validity (i.e., evidence of validity, types of validity, and the relationship between reliability and validity) (II-G-seven-e)
4. Social and cultural factors related to the assessment and evaluation of individuals, groups, and specific populations (II-G-seven-f)
5. Ethical strategies for selecting, administering, and interpreting assessment and evaluation instruments and techniques in counseling (II-G-seven-g)

CEPY 5230. Counseling Theory and Technique**3 Credits (3)**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the ability to foster counseling and helping relationships that are based on studies of the counseling process in a multicultural society and include an orientation to wellness and prevention as desired counseling goals.
2. Students will be able to apply theories and models of counseling, including a systems approach, to conceptualize clients, help select appropriate counseling interventions, and so the student begins to develop a personal model of counseling based on current professional research and practice with the aid of processes provided in this course.
3. Students will demonstrate the ability to foster counseling and helping relationships that include essential interviewing, counseling, and case conceptualization skills as well as developing the ability to provide professional feedback in consultation with other trainees.
4. Students will demonstrate the ability to foster counseling and helping relationships that include developmentally relevant counseling treatment or intervention plans, the development of measurable outcomes for clients, and evidence-based counseling strategies and techniques for prevention and intervention
5. Students will be able to demonstrate counselor characteristics and behaviors that influence helping processes.
6. Students will demonstrate knowledge and ability to provide suicide prevention, crisis intervention, trauma-informed, and community-based strategies, such as Psychological First Aid.

CEPY 5235. Counseling Theory and Techniques for School Psychologists**3 Credits (3)**

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. The student will demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation.
2. The student will demonstrate the ability to examine and apply critical perspectives related to counseling theory and techniques.
3. The student will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents in school settings.
4. The student will demonstrate the development of skills leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds.
5. The student will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in the schools.
6. The student will be able to collaborate with others in the process of becoming a competent school psychologist in providing counseling services in the schools.

CEPY 5240. Child and Adolescent Counseling Theory and Technique**3 Credits (3)**

Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will examine and apply critical perspectives related to counseling children and adolescents.
3. Students will compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will develop a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds.
5. Students will identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 5250. Family Therapy Theory and Technique**3 Credits (3)**

Major theories of family therapy and associated assessment, intervention and evaluation techniques. Restricted to CEP graduate majors.

Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain a systems perspective and differentiate family and other systems theories and major models of family and related interventions.
2. Students will be able to demonstrate and apply an understanding of the family life cycle and impact on family and individual functioning.
3. Students will be able to prepare and utilize various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will be able to illustrate awareness of and skill in the use of formal and informal assessment measures used in family and couple counseling.
5. Students will be able to summarize evidence-based interventions and treatments for family and couple counseling.
6. Students will be able to analyze multicultural counseling theories and techniques for diverse family types and apply multicultural and family theories to one's own experience.
7. Students will be able to demonstrate an ability to communicate and relate effectively with families and couples.
8. Students will be able to describe ethical issues related to counseling families and couples and be able to identify a process to make sound judgments.

CEPY 5260. Group Work Theory and Technique**3 Credits (3)**

Didactic and experiential learning in group theory and practice, which involves experiences in group participation and leadership. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Provide students with an intellectual understanding of group work theory and technique.
2. Provide students with an experiential understanding of group work.
3. To help students develop specific group facilitation competencies

CEPY 5270. Diagnosis and Treatment Planning**3 Credits (3)**

Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will know the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will know the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will understand current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will understand the basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified.
5. Students will know the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM).
6. Students will understand the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will know the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will understand the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will understand appropriate use of diagnosis during a crisis, disaster, or other trauma-causing event. 1
10. Students will be able to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 5280. Primary Care Psychology**3 Credits (3)**

Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Biologic bases of behavior as related to health/illness and coping
2. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Psychological bases of behavior as related to health/illness and coping
3. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Sociocultural bases of behavior as related to health/illness and coping
4. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Understanding and application of inter-professional collaboration
5. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: A knowledge of substance use disorders, particularly opioid use disorder and treatment in a primary care setting
6. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: How to utilize telemedicine effectively

CEPY 5310. Appraisal of Psychoeducational Achievement in a Diverse Society**3 Credits (3)**

Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Define assessment and describe the steps in the assessment process. Practitioner
2. Describe a flowchart for the screening/referral/evaluation process according to New Mexico regulations. Research, Pedagogy
3. Describe the uses of criterion and norm-referenced instruments as well as alternative forms of assessment (observation, curriculum based assessment and informal techniques). Practitioner, Effectiveness
4. Identify and discuss instruments/assessment procedures appropriate for use in identifying academic achievement, learning aptitude, vocational aptitude, performance in specific areas, and social emotional functioning. Effectiveness
5. Identify appropriate instruments/assessment procedures required for the exceptionality recognized under New Mexico regulations. Effectiveness
6. Administer and score twenty-four instruments in reading, math, written language and processing and to utilize these results in completing test interpretations and psycho-educational reports. Effectiveness
7. Interpret, report, and utilize assessment data in special education programming. Reflection, Pedagogy
8. Determine the assessment needs of students who are speakers of languages other than English. Diversity
9. Evaluate a test, write a review, and demonstrate and explain it in class. Practitioners 1
10. Synthesize information gathered through comprehensive assessment procedures into a practical whole. Assessment, Evaluation

CEPY 5320. Career/Life Planning and Vocational Assessment
3 Credits (3)

Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Career development theories and decision-making models.
2. Career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Career development program planning, organization, implementation, administration, and evaluation.
4. Interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Career and educational planning, placement, follow-up, and evaluation.
6. Assessment instruments and techniques relevant to career planning and decision making.
7. Career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 5985. Counseling Practicum
1-6 Credits (1-6P)

Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Prerequisite: CEPY 5230.

Learning Outcomes

1. Understands ethical and legal considerations specifically related to the practice of clinical mental health counseling.
2. Understands a variety of models and theories related to clinical mental health counseling, including the methods, models, and principles of clinical supervision.
3. Understands the management of mental health services and programs, including areas such as administration, finance, and accountability.
4. Demonstrates the ability to apply and adhere to ethical and legal standards in clinical mental health counseling.
5. Recognizes the importance of family, social networks, and community systems in the treatment of mental and emotional disorders.
6. Uses the principles and practices of diagnosis, treatment, referral, and prevention of mental and emotional disorders to initiate, maintain, and terminate counseling.
7. Applies multicultural competencies to clinical mental health counseling involving case conceptualization, diagnosis, treatment, referral, and prevention of mental and emotional disorders.
8. Applies effective strategies to promote client understanding of and access to a variety of community resources.
9. Demonstrates appropriate use of culturally responsive individual, couple, family, group, and systems modalities for initiating, maintaining, and terminating counseling. 1
10. Demonstrates the ability to use procedures for assessing and managing suicide risk. 1
11. Applies current record-keeping standards related to clinical mental health counseling. 1
12. Provides appropriate counseling strategies when working with clients with addiction and co-occurring disorders. 1
13. Demonstrates the ability to recognize his or her own limitations as a clinical mental health counselor and to seek supervision or refer clients when appropriate. 1
14. Maintains information regarding community resources to make appropriate referrals. 1
15. Advocates for policies, programs, and services that are equitable and responsive to the unique needs of clients. 1
16. Demonstrates the ability to modify counseling systems, theories, techniques, and interventions to make them culturally appropriate for diverse populations. 1
17. Knows the principles and models of assessment, case conceptualization, theories of human development, and concepts of normalcy and psychopathology leading to diagnoses and appropriate counseling treatment plans. 1
18. Understands various models and approaches to clinical evaluation and their appropriate uses, including diagnostic interviews, mental status examinations, symptom inventories, and psychoeducational and personality assessments. 1
19. Demonstrates skill in conducting an intake interview, a mental status evaluation, a biopsychosocial history, a mental health history, and a psychological assessment for treatment planning and caseload

CEPY 5990. Advanced Counseling Practicum**3-6 Credits (3-6P)**

Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of counseling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 5985 or consent of instructor.

Learning Outcomes

1. Obtain a minimum of one-hundred and fifty clinical hours including sixty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. Students will have the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. Students will have an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to work with clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in this course.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5997. Special Research Programs**1-6 Credits (1-6)**

Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 9 credits.

Learning Outcomes

1. Learning outcomes will vary depending on course content.

CEPY 5998. Counseling Internship**3-12 Credits (3-12)**

Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 12 credits.

Prerequisite: CEPY 5990.

Learning Outcomes

1. Obtain a minimum of six-hundred clinical hours including two-hundred and forty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. The student has the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. The student has an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to counsel clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in internship.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5999. Master's Thesis**1-15 Credits (1-15)**

Thesis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. To develop and complete master's research thesis.

CEPY 6120. Human Development**3 Credits (3)**

Same as CEPY 5120 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 6130. Psychology of Multiculturalism**3 Credits (3)**

In this advanced course for post-master's graduate students in applied fields of psychology, students will apply psychological concepts related to multiculturalism as well as critical race theories, feminist theories, queer theories, and liberation theories to understand intersecting social identities. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

Learning Outcomes

1. Students will understand and apply multicultural and pluralistic characteristics within and among diverse groups nationally and internationally.
2. Students will understand and apply theories and models of multicultural counseling, cultural identity development, and social justice and advocacy.
3. Students will understand and apply multicultural counseling competencies.
4. Students will understand and apply the impact of heritage, attitudes, beliefs, understandings, and acculturative experiences on an individual's views of others
5. Students will understand and apply the effects of power and privilege for counselors and clients.
6. Students will understand and apply help-seeking behaviors of diverse clients.
7. Students will understand the impact of spiritual beliefs on clients' and counselors' worldviews.
8. Students will understand and apply strategies for identifying and eliminating barriers, prejudices, and processes of intentional and unintentional oppression and discrimination.

CEPY 6140. Cognitive & Affective Basis of Behavior**3 Credits (3)**

This course provides an overview of cognitive and affective bases of behavior as well as the integration of cognition and affect in psychological processes. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to identify key concepts of cognition such as memory, attention and learning.
2. Students will identify the functions and roles of affect and emotional expression.
3. Students will understand the connection between cognition and affect and how these two areas of human function influence each other.
4. Students will be able to integrate and apply research findings and implications in the study of cognition and affect to practical experiences.
5. Students will apply models and theories of cognition and affect to understanding and predicting behavior.

CEPY 6150. Psychology of Social Identities**3 Credits (3)**

Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Heighten the student's awareness of multiple social identities, worldview beliefs, and other within-group variables.
2. Aid the student in developing a knowledge base in the realms of social psychology and multicultural research, culturally-responsive interventions and professional practice.
3. provide experiences for the application of this awareness and knowledge as a means of Develop the skills necessary for being a reflective decision-maker, creative problem solver, and responsive service provider for diverse individuals in a variety practice settings and intervention modalities.

CEPY 6160. History and Systems of Psychology**3 Credits (3)**

History and systems of psychology related to contemporary applied psychology. This course will focus largely on the history of modern psychology and on the major systems (or schools) of psychology. Restricted to CEP graduate majors.

Learning Outcomes

1. Effectively discuss historical and philosophical antecedents and contexts of psychology and compare and contrast multiple perspectives on important issues in this field.
2. Apply global awareness to this topic (e.g., intersecting identities; how interlocking oppressions vary by epoch, continent, nation, cultural group, region, organizational system; etc.)
3. Develop professional arguments; support opinions with reason and personal experience; and demonstrate higher order thinking and creative engagement (for definitions of terms like analyze, synthesize, evaluate, and create.
4. Develop thoughtful inquiries that inspire scholarly discourse and further investigation; consider which types of evidence are needed to find answers; and effectively facilitate respectful, thought-provoking discussions of controversies and debatable topics.

CEPY 6170. Psychology of Poverty**3 Credits (3)**

This course is designed to examine the nature, extent and impact of poverty on Southwestern populations and across the United States in relation to assessment and interventions and its impact on the education and psychological well-being of children and families. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.

Learning Outcomes

1. Students will learn how views of poverty have evolved in history.
2. Students will be aware and demonstrate the skills of the different methods used to measure and understand poverty.
3. Students will identify and apply relevant issues from education, health disparities, and criminal justice related to the psychology of poverty.
4. Students will evaluate and present their own self-awareness and understanding of their worldview of poverty, along with its impact of how they view others in poverty.
5. Students will conduct self-assessments regarding their range of liberalism/conservatism; implicit bias and how it impacts their interpretation of information of poverty.
6. Students will understand and lead discussions as to why poverty remains so prevalent in U.S. society.
7. Students will be able to articulate the within group differences and similarities of racial and ethnic backgrounds or family types that are susceptible to poverty.
8. Students will learn successful interventions in working with children, adolescents and families impacted by the psychology of poverty.

CEPY 6180. Clinical Psychopharmacology**3 Credits (3)**

Basic biological aspects of psychopharmacology with applications to clinical populations and treatment implications. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and apply concepts related basic neuroanatomy, neurochemistry, and neurophysiology.
2. Students will be able to understand and apply basic knowledge related basic biological basis of the interdependence between behavior, cognition, and emotion.
3. Students will understand the pharmacology and pharmacodynamics of major drug groups used in the treatment of CNS diagnoses; including, but no limited to, antidepressants, antipsychotics, anxiolytics, anticonvulsants, and natural remedies or herbal supplementation.
4. Students will recognize the strengths and weaknesses of a wide range of research methodologies to screen compounds and test the mechanisms of action of drugs.
5. Students will understand the drug development process from target identification to FDA approval and ongoing safety surveillance.
6. Students will appreciate how pharmacological investigation informs the understanding of the underlying pathology of the illness.
7. Students will access, critique, and assimilate evidence from scientific studies as it relates to translational neuroscience and the search for promising targets for psychotropic drugs.
8. Students will become familiar with to the indication, contraindication, therapeutic drug monitoring, and effectiveness of medications across DSM-V classifications. As well as psychotropic drug tapering or switching. The implications of patient characteristic and medical co-morbidities are addressed.
9. Students will share informed opinions about advances and challenges in experimental (off-label) psychopharmacology; and of their opinions of integrated psychotherapy or combined medicine. 1
10. Students will work effectively with peers and Instructor; as part of multidisciplinary learning environment.

**CEPY 6185. Ethics, Law & Professional Issues in School Psychology
3 Credits (3)**

This course provides an introduction and overview of the profession of school psychology with emphasis on the roles, functions, and competencies of the school psychologist within the context of legal and ethical practice. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will demonstrate an understanding of various professional issues, role functions, and historical contexts related to the field of school psychology.
2. Students will demonstrate the ability to examine and apply critical perspectives related to various professional issues, role functions, and the historical contexts associated with the field of school psychology.
3. Students will explore best practices issues associated with school psychology role functions and practices.
4. Students will demonstrate the development of skills leading her or him toward becoming a culturally responsive practitioner in the field of school psychology.
5. Students will obtain knowledge of the National Association of School Psychologists (NASP) Principles of Professional Ethics (2020) and the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (2010; 2016 amendments) and learn to apply these principles to specific areas of practice such as assessment, direct and indirect intervention, consultation, and research.
6. Students will understand complexities of ethical and legal issues occurring in school settings and will develop ethical decision-making skills.
7. Students will demonstrate knowledge of the provisions of state and federal statutes such as the Individuals with Disabilities Education Improvement Act (2004), Every Student Succeeds Act (2017) and Section 504 of the Rehabilitation Act of 1973 as well as other case laws related to the practice of school psychology and learn how to apply these mandates to the practice of school psychology.
8. Students will understand the importance of developing awareness of the legal and ethical issues affecting their professional identity and the need to remain current on these issues throughout their careers as school psychologists.
9. Students will continue to emerge as critical thinkers, reflective decision-makers, and creative problem-solvers, in general.

**CEPY 6190. Ethical/Professional Issues in Counseling Psychology
3 Credits (3)**

History of counseling psychology, scientist-practitioner model, American Psychological Association's Ethical Principles of Psychologists and Code of Conduct. Focus on current ethical, professional, and scientific issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be knowledgeable of and act in accordance with the current version of the APA Ethical Principles of Psychologists and Code of Conduct, relevant laws, regulations, rules, and policies governing health service psychology at the organizational, local, state, regional, and federal levels, and relevant professional standards and guidelines; Recognize ethical dilemmas as they arise, and apply ethical decision-making processes in order to resolve the dilemmas; Conduct self in an ethical manner in all professional activities.
2. Students will develop an understanding of how their own personal/cultural history, attitudes, and biases may affect how they understand and interact with people different from themselves; Apply knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation, and service.
3. Students will be expected to behave in ways that reflect the values and attitudes of psychology, including integrity, deportment, professional identity, accountability, lifelong learning, and concern for the welfare of others; Engage in self-reflection regarding one's personal and professional functioning and engage in activities to maintain and improve performance, well-being, and professional effectiveness
4. Students will be expected to produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts; Demonstrate effective interpersonal skills and the ability to manage difficult communication well.

**CEPY 6210. School Psychology Research and Program Evaluation
3 Credits (3)**

Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will advance their foundational knowledge of research methodology and research design.
2. Students will develop skills and knowledge to conduct comprehensive literature reviews.
3. Students will critique scientific research studies by applying attained knowledge in research methodology and design.
4. Students will produce a research proposal they will conduct in their areas of interest within the field of school psychology.
5. Students will present a research proposal that will conduct within the field of school psychology.
6. Students will demonstrate skills and knowledge for program evaluation by developing a program evaluation plan.
7. Students will demonstrate knowledge and skills necessary to conduct single-subject design studies.

**CEPY 6220. Spanish for Mental Health Professionals
3 Credits (3)**

This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, CEP majors. May be repeated up to 3 credits.

Prerequisite: Enrolled in Bilingual School Psychology Training Grant with instructor consent.

Learning Outcomes

1. Students will be able to demonstrate brief, basic conversation in Spanish using mental health and health-care related expressions and terminology.
2. Students will be able to understand and respond to relevant cultural and linguistic client concerns related to presenting issues.
3. Students will be able to increase their Spanish speaking capabilities when engaged in their professional roles (e.g. conducting clinical interviews, gathering mental health histories, conducting assessments and delivering interventions using various theoretical frameworks).
4. Students will understand cultural and social factors that influence the practitioner-client relationship and communication with Latinx clients.
5. Students will be able to engage effectively in role play situations involving application of concepts learned.

**CEPY 6240. Child and Adolescent Counseling Theory and Technique
3 Credits (3)**

Taught with CEPY 5240 with differentiated assignments for Ed.S. and Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will be able to demonstrate the ability to examine and apply critical perspectives related to counseling children and adolescents.
3. Students will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will be able to demonstrate the development of a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds
5. Students will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will be able to collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 6250. Family Therapy Theory and Technique**3 Credits (3)**

Taught with CEPY 5250 with differentiated assignments for Ed.S and Ph.D students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate their comprehension of a systems perspective that provides an understanding of family and other systems theories and major models of family and related interventions.
2. Students will demonstrate an understanding of the family life cycle and impact on family and individual functioning.
3. Students will demonstrate an awareness of and develop skills with various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will demonstrate an awareness of and develop skills in using formal and informal assessment measures used in family and couple counseling.
5. Students will develop conceptual skills that demonstrate an understanding of theory and implementation of interventions.
6. Students will demonstrate knowledge about evidenced-based interventions and treatments for family and couple counseling.
7. Students will demonstrate their understanding of multicultural counseling theories and techniques for family and marital counseling.
8. Students will be able to apply multicultural and family theories to their own experience in an effort to improve your counseling work.
9. Students will demonstrate will demonstrate an ability to communicate and relate effectively to families and couples. 1
10. Students will be able to design and implement outreach and psychoeducational interventions to families and couples. 1
11. Students will demonstrate their knowledge related to ethical issues surrounding counseling families and couples and be able to make sound judgments.

CEPY 6260. Consultation**3 Credits (3)**

Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

CEPY 6265. Diagnostic Class**3 Credits (3)**

Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be expected to demonstrate the knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate understanding of current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will be expected to demonstrate understanding of basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified
5. Students will be expected to demonstrate knowledge of the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM)
6. Students will be expected to demonstrate understanding of the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will be expected to demonstrate knowledge of the the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will be expected to demonstrate understanding of the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will be expected to demonstrate understanding of the appropriate use of diagnosis during a crisis, disaster, or other trauma-causing events. 1
10. Students will be expected to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 6270. Diagnosis and Treatment Planning**3 Credits (3)**

Taught with CEPY 5270 with differentiated assignments for Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be expected to demonstrate knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate practice of using the DSM 5 to create differential diagnoses.
4. Students will be expected to construct an initial treatment plan based upon a systemic and differential diagnosis.
5. Students will be expected to formulate a culturally relevant diagnosis and treatment plan.
6. Students will be expected to discuss the barriers to assessment and treatment, as it relates to mental illness stigma.

CEPY 6275. Professional Preparation Seminar**3 Credits (3)**

This seminar course provides academic support for students enrolled in the Specialist in Education (Ed.S.) School Psychology Program in preparation for capstone experiences (i.e., internship and culminating exams) in addition to continued development of students' professional identity as School Psychologists.

Learning Outcomes

1. Students will reflect on the growth of their knowledge, experiences, and skills gained in the School Psychology Program (SPP).
2. Students will reflect on how to expand their knowledge and skills during their internship.
3. Students will prepare for securing an internship position.
4. Students will develop and articulate a professional philosophy of counseling within school psychology.
5. Students will demonstrate skill in oral and written presentations.
6. Students will understand the role of mentoring and supervision in personal and professional.

CEPY 6320. Career/Life Planning and Vocational Assessment**3 Credits (3)**

Taught with CEPY 5320 with differentiated assignments for Ed.S and Ph.D. students. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Knowledge and understanding of career development theories and decision-making models.
2. Knowledge and understanding of career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Knowledge and understanding of career development program planning, organization, implementation, administration, and evaluation.
4. Knowledge and understanding of interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Knowledge and understanding of career and educational planning, placement, follow-up, and evaluation.
6. Knowledge and understanding of assessment instruments and techniques relevant to career planning and decision making.
7. Knowledge and understanding of career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 6330. Academic & Behavioral Assessment & Intervention**3 Credits (3)**

This course introduces basic concepts, methods, and applications of academic and behavior assessment and intervention. Students will learn how to conduct functional/informal assessments of academic and behavior and how to write behavior and academic plans. Methods appropriate for assessment and intervention of school-age children will be emphasized. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors.

Learning Outcomes

1. Students will gain and demonstrate knowledge on how behavior assessment fits within psychological/psycho-educational assessment.
2. Students will demonstrate the ability to examine and apply critical perspectives related to educational assessment.
3. Students will learn the rational, defining features and theoretical underpinnings of behavioral assessment.
4. Students will learn how to conduct and complete functional assessments of behavior.
5. Students will learn how to develop and evaluate a satisfactory positive behavior intervention plan.
6. Students will develop and/or learn techniques of behavioral observation.
7. Students will learn how to integrate behavioral observation findings with other assessment methods.

CEPY 6340. Appraisal of Cognitive Functioning**3 Credits (3)**

Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will become knowledgeable about the historical background of intelligence testing.
2. Students will become knowledgeable about the major theories of intelligence.
3. Students will be able to discuss orally and in writing the pros and cons of intelligence testing and will be able to support the discussion with specific facts and research.
4. Students will be able to select "appropriate" intellectual assessment instruments for children, adolescents, and adults.
5. Students will be able to state pertinent information relative to these major intelligence tests such as age range, standardization, reliability, and validity.
6. Students will demonstrate mastery of administration, scoring, and interpretation of various norm-referenced cognitive assessment instruments while taking into consideration the cultural context of the individual.
7. The student will be able to demonstrate the ability to integrate information into meaningful written reports.

CEPY 6350. Appraisal of Personality**3 Credits (3)**

Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation, and service.
2. Produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts.
3. Demonstrate current knowledge of diagnostic classification systems, functional and dysfunctional behaviors, including consideration of client strengths and psychopathology.
4. Demonstrate understanding of human behavior within its context (e.g., family, social, societal and cultural).
5. Demonstrate the ability to apply the knowledge of functional and dysfunctional behaviors including context to the assessment and/or diagnostic process.
6. Select and apply assessment methods that draw from the best available empirical literature and that reflect the science of measurement and psychometrics; collect relevant data using multiple sources and methods appropriate to the identified goals and questions of the assessment as well as relevant diversity characteristics of the service recipient.
7. Interpret assessment results, following current research and professional standards and guidelines, to inform case conceptualization, classification, and recommendations, while guarding against decision-making biases, distinguishing the aspects of assessment that are subjective from those that are objective.
8. Communicate orally and in written documents the findings and implications of the assessment in an accurate and effective manner sensitive to a range of audiences.

CEPY 6410. Introduction to Qualitative Research
3 Credits (3)

This course is intended to be an introduction to qualitative research methods for persons wishing to understand, apply, and conduct qualitative studies with human subjects in the fields of counseling and psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand the importance of applying and conducting culture-centered and ethical psychological research among persons from ethnic, linguistic, and racial minority backgrounds.
2. Students will understand the shift that has taken place in the past century from ignoring cultural variables to that of valuing the vast amounts of uncharted knowledge that is contained therein.
3. Students will gain a deeper understanding of the qualitative paradigm that informs research and the way we conduct and consume it.
4. Students will understand the components that make up good qualitative research considering carefully the variables that inform the proposed outcome of the study.
5. Students will assess the benefit of research to the entities, individuals and communities being studied.
6. Students will learn to be grounded in the empirical and conceptual literature on the ways that culture influences the variables under investigation, as well as psychological and social science research traditions and skills.
7. Students will be aware of their cultural assumptions on which their research questions are based (Egharevba, 2001).
8. Students will learn to be aware of, and if appropriate, to apply indigenous theories when conceptualizing research studies. They are encouraged to include members of cultural communities when conceptualizing research, with particular concern for the benefits of the research to the community (Fontes, 1998; LaFromboise, 1988).
9. Students will learn to consider the psychological (rather than demographic) contextual factors of race, ethnicity, language, gender, sexual orientation, socio-economic status, and other social dimensions of personal experience in conceptualizing their research design (Fouad Brown, 2000; Quintana et al., 2001). 1
10. Students will strive to recognize and incorporate research methods that most effectively complement the worldview and lifestyles of persons who come from a specific cultural and linguistic population; e.g., quantitative and qualitative research strategies (Hoshmand, 1989; Marin Marin, 1991; Ponterotto Casas, 1991). 1
11. Students will learn to consider culturally sensitive assessment techniques and data-generating procedures. 1
12. In analyzing and interpreting data from research studies and in proposed research, students will learn to consider cultural influences as possible explanations for their findings. 1
13. Students will learn the importance of considering the benefit to participants, and to include participants in the interpretation of results. They are encouraged to find ways for the results to be of benefit to the community, and to represent the participants' perspectives accurately and authentically.

CEPY 6420. Psychometrics
3 Credits (3)

An introduction to psychometrics, including topics such as theory and techniques of psychological measurement, scale and inventory construction, reliability, validity, evaluation of measurement quality, classical and contemporary measurement theory, and standardization. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will acquire knowledge and skills in psychometrics.
2. Students will understand and apply psychometric theory through the completion of instrument evaluation, instrument development, and factor analysis projects.

CEPY 6425. Counseling Psychology Research
3 Credits (3)

Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students refine their foundational knowledge of research methods.
2. Students learn how to conduct comprehensive literature reviews in counseling psychology.
3. Students learn about sampling procedures and their limitations.
4. Students refine their knowledge about measurement applied to research (including the reliability, validity, norms and cultural relevance of measurement procedures).
5. Students refine their knowledge of statistics and the application of statistics to deriving conclusions from research data.
6. Students learn about ethical issues related to conducting research.
7. Students apply knowledge and skills in the areas described above to the critique of counseling psychology research.
8. Students apply knowledge and skills in the areas described above to the development of a draft proposal for research they can conduct in their area of interest within counseling psychology.
9. Students present and defend a proposal for research in counseling psychology.

CEPY 6430. Advanced Statistics**3 Credits (3)**

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. Both hand calculation and computer packages will be employed. Open to all College of Education majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to describe procedural steps to submit proposals to the IRB at NMSU.
2. Students will be able to create data files and use SPSS to clean and examine datasets to assess data quality.
3. Students will be understand how to plan to address a research question, identify appropriate statistical tests and variables.
4. Students will be able to use SPSS to run statistical analyses to examine differences in means or relationships between two variables.
5. Students will understand how to assess assumptions and interpret findings of these analyses.
6. Students will understand key concepts, such as statistical significance, error, effect size, sample size, and statistical power.of analytic approaches, findings, and interpretations of the data
7. Students will be able to effectively communicate using scientific writing and accurate portrayal of the data in terms.

CEPY 6440. Multivariate Statistics**3 Credits (3)**

Theories and techniques of multivariate statistics as applied to education and psychology. Includes multiple regression, logistic regression, MANOVA, factor analysis, and structural equation modeling. Computer packages will be the primary tool for data analysis. Open to all majors of the College of Education. May be repeated up to 3 credits.

Learning Outcomes

1. To be able to construct statistical models, both non-multivariate (e.g., multiple regression) and multivariate (e.g., MANOVA, MANCOVA), and carry out the analysis using statistical software (e.g., SPSS, R).
2. To be able to interpret results of both non-multivariate and multivariate analyses, in the context of the data.
3. To be able to generate original research questions that can be answered with quantitative methods discussed in this course.
4. To be able to carry out a quantitative method discussed in this course to answer a research question(s), and to be able to appropriately interpret the results.
5. To be able to read published research in your field of study that makes use of multivariate methods, and critically interpret the results based on the claims and evidence provided.

CEPY 6450. Educational Experimentation**3 Credits (3)**

Same as ELAD 6910. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on abilities to identify and effectively manage strengths and potential barriers that may impact progress on dissertation by thoroughly analyzing strengths and barriers and developing an action plan.
2. Conceptualize a dissertation topic that is germane to the field of Counseling Psychology and provide a convincing argument supporting the need for such research.
3. Conduct extensive and systematic literature searches for previous research and theory relevant to dissertation topic.
4. Write a comprehensive outline and annotated bibliography of the literature that incorporates the most relevant research and theoretical work associated with dissertation topic to inform literature review.
5. Clearly state research questions and hypotheses that will be examined in dissertation.
6. Create a detailed and comprehensive action plan that adheres to APA ethical guidelines for research that a reader can use to replicate dissertation study (i.e., method section).
7. Demonstrate understanding of the importance of having a diverse sample.
8. Present dissertation research to the class in a simulated proposal meeting.
9. Become more adept at providing support and challenge to student peers during weekly seminars and simulated proposal meetings. 1
10. Identify strategies for choosing and working with your dissertation committee effectively. 1
11. Demonstrate your knowledge of APA writing style.

**CEPY 6510. Practicum in School Psychology: Psychoeducational
1-6 Credits (1-6)**

Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Graded: S/U Grading (S/U, Audit). Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6340, CEPY 5310.

Learning Outcomes

1. Students will demonstrate sound diagnostic reasoning and data based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation methods.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally responsive in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues, appropriate to the functioning as a professional school psychologist.

**CEPY 6520. Field Experience in Educational Diagnostics
1-6 Credits (1-6)**

CEPY 6520 is designed to provide students with supervised school-based experiences and practices. The goal of the course is for students to master the competencies required for the delivery of academic services in the educational diagnostician role. The specific emphases in this course are placed on a data-based decision-making skills, psychoeducational assessment activities, and academic interventions. Under faculty and school-system staff supervisions, students will assume service delivery responsibilities and with increasing independence will respond to the diagnostic and intervention needs of students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Prerequisite: CEPY 6340 and CEPY 5310.

Learning Outcomes

1. Students will demonstrate sound diagnostic reasoning and data-based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation method.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions and provide recommendations for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally competent in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues.

**CEPY 6530. Practicum in School Psychology: Psychological
1-6 Credits (1-6)**

School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multifactorial, integrative, family assessments) expected of school psychologists. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 6 credits.

Learning Outcomes

1. Enhance the knowledge and skill students already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Provide students with the opportunity to respond to supervision and use supervision in a constructive manner.
3. Provide students with the opportunity to share experiences as school psychologists in training in a supportive environment.
4. Provide the students with the opportunity to engage in learning activities that will assist them in functioning independently as school psychologists (i.e., data-based decision-making and accountability).
5. Provide the instructor with the opportunity to observe the student's ability to plan and execute successful interventions and demonstrate diagnostic skills.
6. Students will be able to establish a counseling relationship with students' clients through the provision of individual and/or group counseling as stated on their IEP's.
7. Students will be exposed to current issues, theories, and practices in the field of school psychology.
8. Students will be able to integrate theory/research and practice via case presentations.
9. Students will be able to demonstrate knowledge and integration of technology in their practice as school psychologist. 1
10. Students will refine their skills in working with culturally and linguistically diverse students, families, educators, and other professionals.

**CEPY 6540. Advanced Multicultural School Psychology Field Experience
3 Credits (3)**

Supervised school psychology field experience including appraisal diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation from a multicultural perspective with diverse populations. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors.

Prerequisite: CEPY 6510, CEPY 6530.

Learning Outcomes

1. Students will enhance the knowledge and skill they already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Students will respond to supervision and use supervision in a constructive manner.
3. Students will share experiences as school psychologists in training in a supportive environment.
4. Students will engage in learning activities that will assist them in functioning independently as doctoral-level school psychologists (i.e., data-based decision-making and accountability).

**CEPY 6550. Counseling Psychology Theory/Practicum
1-6 Credits (1-6)**

Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Learning Outcomes

1. Students will refine their understanding of counseling theory and hone counseling skills through readings, lecture, demonstration, case presentation, and supervised counseling experiences.
2. Students will learn about and employ a variety of evidence-based approaches to counseling and psychotherapy that have historically been used by counseling psychologists.
3. Students will reflect on their development of an approach to counseling that is effective, theoretically sensible, and personally congruent.

**CEPY 6560. Group Work Theory/Practicum
1-6 Credits (1-6)**

Application of theory in group work with clients and in supervising group leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6550.

Learning Outcomes

1. Apply the basic elements of group theory to small groups, including principles of group dynamics, group process components, developmental stage theories, group member roles and behaviors, and therapeutic factors.
2. Demonstrate effective leadership skills and intervention strategies in simulated class discussions to actual group sessions in the community.
3. Possess knowledge of ethical and professional issues encountered by group leaders.
4. Develop awareness of the relative advantages of group work for clients and counselors, as well as other practical advantages; discern when group may not be the preferred modality for clients.
5. Distinguish characteristics of various group theories and approaches.
6. Identify relevant socio-cultural factors and multicultural considerations in group work and its impact on theory, process, and group leadership skills.
7. Communicate how they have improved their skill development relative to self-awareness and group leadership.
8. Have knowledge of professional group organizations, certifications (Certified Group Psychotherapist), and be able to effectively market group skills in preparation for the pre-doctoral internship year.

CEPY 6570. Advanced Counseling Psychology Practicum**1-6 Credits (1-6P)**

Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Graded: S/U Grading (S/U, Audit). May be repeated up to 12 credits.

Prerequisite: CEPY 6560.

Learning Outcomes

1. To increase skill level in clinical work with individual/group/couple therapy and initial intakes through practice, formal supervision, and group case discussion.
2. To integrate one's theoretical orientation into a brief practice therapy model and to improve treatment planning ability.
3. To improve treatment planning ability by increasing knowledge and integration of empirically supported interventions.
4. To increase exposure and use of assessment procedures and tools in clinical work.
5. To be cognizant of cultural/diversity issues with clients and develop enough self-awareness to respond effectively to a wide range of clients.
6. To examine professional identity concerns as they arise and increase one's knowledge base about specific areas of clinical interest.
7. To adhere to APA's Ethical Principles of Psychologists and Code of Conduct and Specialty Guidelines for the Delivery of Service by Counseling Psychologists and Guidelines for Providers of Psychological Services to Ethnic, Linguistic, and Culturally Diverse Populations, and to develop a more applied understanding of them.
8. To increase one's knowledge of relevant Mental Health Statutes and the Board of Psychologist Examiners Rules and Regulations for the state in which you are practicing (NM or TX).
9. To demonstrate self-awareness and self-reflection through ongoing self-evaluation of counseling skills. 1
10. To learn how to design and implement outreach presentations and to gain experience in consulting with interdisciplinary staff. 1
11. To become familiar with and acquire practice with career counseling and the use of career inventories.

CEPY 6580. Supervision Theory and Practicum**1-6 Credits (1-6)**

Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6530 or CEPY 6570.

Learning Outcomes

1. Students will be able to conceptualize the counseling supervision process.
2. Students will be able to understand the differences between various models of counseling supervision in order to develop a clearly conceptualized supervision theory/style.
3. Students will be able to establish an effective supervisory relationship.
4. Students will be able to demonstrate a variety of appropriately used supervision interventions.
5. Students will be able to demonstrate self-awareness through ongoing self-assessment of supervisory skills and self-reflection of your experience.
6. Students will be able to accurately assess your supervisee's abilities and developmental level.
7. Students will be able to be cognizant of cultural/diversity issues with supervisees and develop enough self-awareness to respond effectively to such issues in both supervision and counseling.
8. Students will be able to provide clear and timely feedback to your supervisee based on your on-going assessment.
9. Students will be able to demonstrate the ability to write accurate and timely supervision process and progress notes. 1
10. Students will be able to understand the differences between various models of consultation. 1
11. Students will be able to understand the major issues in consulting and its place within the counseling profession, including orienting students to their professional identities.1
12. Students will be able to understand how to orient students to their professional identities (school psychology, counseling psychology, or counseling. In addition, this course also provides supervisors an orientation to the counseling profession, including its history, counseling professional associations (e.g., the American Counseling Association), counseling licensure, roles counselors full fill in the community, and the difference between counseling and other related professions.

CEPY 6590. Behavioral Health Practicum**1-6 Credits (1-6)**

An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Learning Outcomes

1. Students will be able to apply a Biopsychosocial model of health and illness to case conceptualizations, treatment plans, and interventions at individual, group, and systemic levels.
2. Students will learn and use motivational interviewing to support patient behavior change
3. Students will learn strategies to employ telehealth services
4. Students will learn behavioral strategies for Opiate Use Disorder
5. Students will learn and perform a functional assessment of patient problems
6. Students will learn and apply evidence-based brief behavior change interventions (e.g. goal setting, self-monitoring, stimulus control, positive reinforcement, guided imagery, progressive muscle relaxation, mindfulness social support)
7. Students will describe and demonstrate behavioral health consultation skills
8. Students will demonstrate understanding of health disparities and social justice issues relevant to health care setting, patient population, and service delivery models.
9. Students will learn about ethical considerations for psychologists in health care settings

CEPY 6610. Internship in School Psychology**1-12 Credits (1-12)**

Supervised experience in school psychology. Restricted to CEP graduate majors. May be repeated up to 12 credits.

Prerequisite: CEPY 6510, CEPY 6530.

Learning Outcomes

1. Varies

CEPY 6620. Internship in Counseling Psychology I**1-18 Credits (1-18)**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. Restricted to CEP graduate majors. May be repeated up to 18 credits.

Learning Outcomes

1. Students will complete the full-time equivalent of one calendar year internship at a site accredited by the American Psychological Association (APA) that has been matched with the student through the APPIC process.

CEPY 6630. Internship in Counseling Psychology II**1-18 Credits (1-18)**

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean May be repeated up to 18 credits.

Learning Outcomes

1. Varies by site.

CEPY 6640. Doctoral Internship in School Psychology**6-12 Credits (6-12)**

Supervised doctoral internship experience in school psychology. 1800 to 2000 clock hours are completed on a full-time basis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 12 credits.

Prerequisite: CEPY 6510, CEPY 6530, CEPY 6540.

Learning Outcomes

1. Varies by site.

CEPY 6996. Selected Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits.

Learning Outcomes

1. Varies

CEPY 6999. Ed.S. Thesis**1-15 Credits (1-15)**

Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

CEPY 7000. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

CHEF-CULINARY ARTS

CHEF 101. Culinary Arts Kitchen Orientation

3 Credits (3)

Provides students with basic information and skills necessary for success in the Culinary Arts program. Students learn basic kitchen routines, safety and sanitation, professional conduct and deportment, standard kitchen calculations, knife handling, and are introduced to the laboratories for initial cooking experiences. Restricted to Community Colleges campuses only.

CHEF 125. Introductory Cake Decorating

1 Credit (2P)

Introduction to the professional cake decorating techniques used by pastry chefs. Basic skills of piping a variety of icings into different patterns are taught. Restricted to Community Colleges campuses only.

Prerequisite(s): Consent of instructor.

CHEF 126. Intermediate Cake Decorating

1 Credit (2P)

Introduction to more advanced professional cake decorating techniques used by pastry chefs. Fondant work and more complex decorating schemes are taught. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEF 125.

CHEF 127. Chocolate Work

1 Credit (2P)

Introduction to working with chocolate utilizing a variety of methods. Tempering, forming, molding, and other professional techniques will be taught. Restricted to Community Colleges campuses only.

Prerequisite(s): Consent of Instructor.

CHEF 128. Advanced Chocolate Work

1 Credit (2P)

More advanced treatments of chocolate are explored and professional techniques for the chocolatier are developed. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEF 127.

CHEF 129. Wedding Cake Design and Construction

1 Credit (2P)

Basic skills in designing wedding (or other specialty event) cakes. Includes shaping, icing selection, decorating scheme, presentation, transportation, and remote set up. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEF 125 and CHEF 126.

CHEF 155. Special Topics

1-3 Credits (1-3)

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CHEF 165. Math for Kitchen Operations

3 Credits (3)

Fundamental mathematical concepts and computations, including measurement, recipe scaling and conversions, metric unit conversion, ingredient yield calculations, ratios and cost extensions are covered. Examples of basic mathematical calculations use kitchen and food service functions, as well as situations to demonstrate principles.

CHEF 211. Food Production Management I

3 Credits (2+2P)

Introduction to kitchen design, workflow, and commercial equipment. Techniques, methods, and application of basic food production principles. Practical experience in cooking processes from a managerial viewpoint. Crosslisted with: HOST 211. Restricted to Community Colleges only.

CHEF 212. Food Production Management II

3 Credits (2+2P)

Selection and use of ingredients. Demonstration and application of classical and modern cooking and preparation techniques. Management techniques for kitchen personnel. Recipe design and analysis. Crosslisted with: HOST 212. Restricted to Community Colleges only.

Prerequisite(s): CHEF 211 or consent of instructor.

CHEF 213. Bakery Management I

3 Credits (2+2P)

Fundamentals of baking from a supervisory/management perspective. Exposure to commercial equipment and processes. Introduction to commercial alternatives to scratch-preparation methods. Crosslisted with: HOST 213. Restricted to Community Colleges only.

CHEF 214. Bakery Management II

3 Credits (2+2P)

Advanced techniques and management of bakery operations are explored. Students learn classical forms and techniques. Modern methods of preparing traditional pastry and baked goods are introduced. Crosslisted with: HOST218. Restricted to Community Colleges only.

Prerequisite(s): CHEF 213 or consent of instructor.

CHEF 233. Culinary Arts Fundamentals I

4 Credits (1+9P)

Introduction to the basics of culinary arts, including ingredients recognition, cooking methods and techniques, knife usage, preparation of basic stocks, mother sauces, starches and vegetables. Students will participate in laboratory work designed to create an understanding of the professional role of the culinarian. Preparation and production of food products integral to service to guests is incorporated in the course. May be repeated up to 4 credits. Consent of Instructor required. Restricted to: CHEF, HOST, HSMG, HOCH majors. Restricted to Community Colleges campuses only.

CHEF 234. Culinary Arts Fundamentals II

4 Credits (1+9P)

Continuation of introductory course focusing on meat cookery, daughter sauces, cold food preparation, poultry and seafood. Safe use of equipment is emphasized while experiencing differing methods of preparation and cooking. Preparation and production of food products integral to service of guests is incorporated in this course. May be repeated up to 4 credits. Restricted to: HOST,HSMG,CHEF majors. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEF 233 with a grade of "C-" or better.

CHEF 235. Advanced Culinary Arts I**4 Credits (1+9P)**

Exploration and experience in preparation techniques beyond the basic level. Nutritional components of food are discussed, as in the application of good nutrition practices in recipe design. Students are encouraged to use creative methods to expand the individual's culinary expressions. Prepares food products for service to guests in both bulk feeding and individual service settings. Plans, prepares, serves and critiques meals provided for students, faculty and staff. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): CHEF 234 with a grade of "C" or better if course has been previously taken. Restricted to: CHEF majors. Restricted to Community Colleges campuses only.

CHEF 236. Advanced Culinary Arts II**4 Credits (1+9P)**

Advanced techniques and experimental use of food combinations to enhance the student's repertoire of skills and abilities. Utilizes knowledge to develop recipes for unique products. Plans, prepares, serves and critiques meals provided for students, faculty and staff. Restricted to: CHEF majors. Restricted to Community Colleges campuses only.

Prerequisite(s): CHEF 235 with a grade of "C" or better.

CHEF 237. Banquet/Catering Production**3 Credits (1+6P)**

Planning and implementation of the culinary aspects of catered functions. Development of time schedules, work assignments and service plans for catered events and banquet functions. Production of food items in appropriate quantities for catered events. Costing and control functions are covered. May be repeated up to 6 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of "C" or above in CHEF 233.

CHEF 240. Baking Fundamentals I**4 Credits (1+9P)**

Introduction to baking techniques, measurement and use of ingredients; equipment use and chemical reactions inherent in the baking process. Production of simple desserts and baked goods. Introduction to working with bread doughs. Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

Corequisite(s): CHEF 233.

CHEF 241. Baking Fundamentals II**4 Credits (1+9P)**

More advanced baking and bread making techniques are covered in this course with emphasis on the more advanced elements of quantity production. Students work with a variety of products and ingredients. Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

Prerequisite(s): grade of "C" or above in CHEF 240.

CHEF 242. Intermediate Baking I**4 Credits (1+9P)**

More advanced baking and pastry techniques are covered in this course with emphasis on the basic elements of patisserie production. Focus is on preparing students to work in a pastry kitchen. Restricted to: HOST, CHEF majors. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of "C" or above in CHEF 241.

CHEF 243. Intermediate Baking II**4 Credits (1+9P)**

Continuation of work with basic elements of patisserie products including laminated doughs and filled products. Students prepare creams, custards, fillings and are introduced to cake assembly procedures. Restricted to: CULI majors. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of "C" or above in CHEF 242.

CHEF 255. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to: CULI, HOST, HSMG majors. Restricted to Community Colleges campuses only.

CHEF 256. International Cuisine**3 Credits (1+6P)**

Exploration into a variety of international cuisines is undertaken, including the cultural and historical backgrounds of the foods being prepared. Students work on developing themed menus and production plans for meals utilizing a single international cuisine. May be repeated up to 6 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of "C" or above in CHEF 233.

CHEF 257. Garde Manger**3 Credits (1+6P)**

Traditional garde manger skills are taught, including plated salads, cold foods, entremets, pates, forcemeat, terrines, charcuterie and chaud froid work. The art and craft of food design, preparation and service are emphasized. May be repeated up to 3 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of "C" or above in CHEF 233.

CHEF 260. Nutrition for Chefs**3 Credits (3)**

Aspects of basic human nutritional requirements are covered as are the applications of the standards to the cooking and baking. Meeting the USDA nutrient guidelines while preparing good tasting food is discussed, calorie, fat and sodium reduction techniques are explored.

CHEM-CHEMISTRY

CHEM 1111. Basic Chemistry**3 Credits (3)**

For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.

Prerequisite: Enhanced ACT composite score of at least 18 or a grade of C- or better in CCDM 114 N.

Learning Outcomes

1. The goals and objectives for CHEM 1111 are to equip students with the necessary problem solving skills to be successful in CHEM 1215G/1225G

CHEM 1120G. Introduction to Chemistry Lecture and Laboratory (non majors)**4 Credits (3+3P)**

This course covers qualitative and quantitative areas of non-organic general chemistry for non-science majors and some health professions. Students will learn and apply principles pertaining, but not limited to, atomic and molecular structure, the periodic table, acids and bases, mass relationships, and solutions. The laboratory component introduces students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite: CCDM 114N or A S 103 or MATH 1215 or higher.

Learning Outcomes

1. (Lecture) Use the different systems of measurements and perform conversions within the same system of measurement and between different systems of measurements
2. (Lecture) Identify elements from their name or symbol, use the periodic table to describe reactivity patterns of elements and to predict compound formation.
3. (Lecture) Describe the basic structure of an atom using subatomic particles, and apply these concepts to nuclear reactions.
4. (Lecture) Describe ion formation and the difference between covalent and ionic compounds. Name and write formulas for ionic and simple molecular compounds.
5. (Lecture) Write and balance chemical reactions. Use balanced reactions in stoichiometric calculations.
6. (Lecture) Describe the differences between the solid, liquid and gas phases. Use the gas laws in calculations, and apply these laws to everyday situations.
7. (Lecture) Explain different types of energy, and how energy is released or absorbed in a reaction
8. (Lecture) Describe acid and base behavior.
9. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result. 1
10. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result 1
11. (Laboratory) Practice concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines. 1
12. (Laboratory) Demonstrate the computational skills needed to perform appropriate laboratory-related calculations to include, but not be limited to determining the number of significant figures in numerical value, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable. 1
13. (Laboratory) Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital). 1
14. (Laboratory) Record quantitatively measured values to the correct number of significant figures and assign the correct units. 1
15. (Laboratory) Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration. 1
16. (Laboratory) Draw appropriate conclusions based on data and analyses. 1
17. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
18. Determine chemical formulas and classify different types of reactions. 1

CHEM 1121. General Supplemental Instruction I**1 Credit (1)**

Collaborative workshop for students in General Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 1215G.

CHEM 1122. General Supplemental Instruction II**1 Credit (1)**

Collaborative workshop for students in General Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 1225G.

CHEM 1123. Principles of Supplemental Instruction III**1 Credit (1)**

Collaborative workshop for students in CHEM 1120G, Principles and Applications of Chemistry. Course does not count toward departmental degree requirements. May be repeated for maximum of 2 credits.

Corequisite(s): CHEM 1120G.

CHEM 1215G. General Chemistry I Lecture and Laboratory for STEM Majors**4 Credits (3+3P)**

This course covers descriptive and theoretical chemistry.

Prerequisite: (1) grade of C- or better in MATH 1215 or higher, or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 1215.

Learning Outcomes

1. Use dimensional analysis, the SI system of units and appropriate significant figures to solve quantitative calculations in science. Understand the differences between physical and chemical changes to matter. Classify types of matter.
2. Understand the scientific method in the context of scientific discoveries.
3. Explain the structure of atoms, isotopes and ions in terms of subatomic particles.
4. Analyze how periodic properties (e.g. electronegativity, atomic and ionic radii, ionization energy, electron affinity, metallic character) and reactivity of elements results from electron configurations of atoms.
5. Understand the creation of different types of compounds (ionic and molecular), comparing and contrasting their structures, naming schemes and formulas. Apply knowledge of electronic structure to determine molecular spatial arrangement and polarity.
6. Understand bulk pure substances, their properties and their states of matter by understanding and identifying intermolecular forces. Apply kinetic molecular theory to relate atomic level behavior to macroscopic properties. Introduce the mole and apply the mole concept to amounts on a macroscopic and a microscopic level
7. Understand mixtures, solubility by considering intermolecular forces and expressing concentration in molarity.
8. Identify different reaction types. Apply the law of conservation of mass to reactions. Perform stoichiometry on balanced reactions. Laboratory Student Learning Outcomes
9. Demonstrate and apply concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
10. Demonstrate the computational skills needed to perform appropriate laboratory related calculations to include, but not be limited to determining the number of significant figures in numerical value with the correct units, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.
11. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
12. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
13. Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration.
14. Draw conclusions based on data and analyses from laboratory experiments.
15. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1216. General Chemistry I Lecture and Laboratory for CHEM Majors**4 Credits (3+3P)**

As the first of a two-semester sequence, this course teaches fundamental concepts in chemistry, including the electronic structure of atoms, chemical periodicity, nature of chemical bonds, molecular structure, the three phases of matter, etc. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): Eligible to take MATH 1250G and an ACT composite score of 22 or higher.

Learning Outcomes

1. Apply the mole concept to amounts at a microscopic level and use this to perform stoichiometric calculations for reactions in solution, gases and thermochemistry.
2. Calculate solution concentrations in various units.
3. Apply the gas laws and kinetic molecular theory to relate atomic level behavior to macroscopic properties.
4. Explain the electronic structure of atoms, isotopes and ions in terms of its subatomic particles.
5. Analyze how periodic properties (e.g. electronegativity, atomic and ionic radii, ionization energy, electron affinity, metallic character) and reactivity of elements results from electronic configurations of atoms.
6. Understand the nature of chemical bonds (ionic and covalent). Apply knowledge of electronic structure to determine molecular structure and polarity.
7. Understand the formation of different phases of matter and the underlying fundamental intermolecular interactions.
8. Describe physical states and changes, and distinguish these from chemical changes.
9. Describe the energy conversions that occur in chemical reactions and state changes, relating heat of reaction to thermodynamic properties such as enthalpy and internal energy; apply these principles to measure and calculate energy changes in reaction. 1
10. Apply principles of general chemistry to specific real-world problems in environment, engineering and health-related fields.

CHEM 1225G. General Chemistry II Lecture and Laboratory for STEM Majors**4 Credits (3+3P)**

This course is intended to serve as a continuation of general chemistry principles for students enrolled in science, engineering, and certain preprofessional programs. The course includes, but is not limited to a theoretical and quantitative coverage of solutions and their properties, kinetics, chemical equilibrium, acids and bases, entropy and free energy, electrochemistry, and nuclear chemistry. Additional topics may include (as time permits) organic, polymer, atmospheric, and biochemistry. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): C- or better in CHEM 1215G.

Learning Outcomes

1. Explain the intermolecular attractive forces that determine physical properties and phase transitions, and apply this knowledge to qualitatively evaluate these forces from structure and to predict the physical properties that result.
2. Calculate solution concentrations in various units, explain the effects of temperature, pressure and structure on solubility, and describe the colligative properties of solutions, and determine solution concentrations using colligative property values and vice versa.
3. Describe the dynamic nature of chemical equilibrium, and apply LeChatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures as well as describe the equilibrium constant and use it to determine whether equilibrium has been established, and calculate equilibrium constants from equilibrium concentrations and vice versa.
4. Describe the different models of acids and base behavior and the molecular basis for acid strength, as well as apply equilibrium principles to aqueous solutions, including acid/base and solubility reactions, and calculate pH and species concentrations in buffered and unbuffered solutions.
5. Explain titration curves as well as calculate concentrations of reactants.
6. Explain and calculate the thermodynamic functions, enthalpy, entropy and Gibbs free energy, for a chemical system, and relate these functions to equilibrium constants Student Learning Outcomes – Laboratory
7. Demonstrate and apply concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
8. Demonstrate the computational skills needed to perform appropriate laboratory related calculations to include, but not be limited to determining the number of significant figures in numerical value with the correct units, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.
9. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
10. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
11. Perform basic laboratory operations related to, but not limited to, colligative properties of solutions, chemical equilibria, acid/base titrations, electrochemistry.
12. Draw conclusions based on data and analyses from laboratory experiments.
13. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1226. General Chemistry II Lecture and Laboratory for CHEM Majors**4 Credits (3+3P)**

As the second of a two-semester sequence, this course teaches fundamental concepts in chemistry, including solutions, equilibria, electrochemistry, thermodynamics and kinetics. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): C- or better in CHEM 1216.

Learning Outcomes

1. Describe the colligative properties of solutions and explain them using intermolecular forces. Determine solution concentrations using colligative property values and vice versa.
2. Explain rates of reactions, rate laws, and half-life; determine the rate, rate law and rate constant of a reaction and calculate concentration as a function of time and vice versa. Understand the principle of catalysis.
3. Explain the collision model of reaction dynamics, including activation energy, catalysts and temperature; Derive a rate law from a reaction mechanism and evaluate the consistency of a mechanism with a given rate law.
4. Describe the dynamic nature of chemical equilibrium and its relation to reaction rates; apply Le Chatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures.
5. Describe the equilibrium constant and use it to determine whether equilibrium has been established; calculate equilibrium constants from equilibrium concentrations (including pressures) and vice versa.
6. Describe the different models of acids and base behavior, and the molecular basis for acid strength.

CHEM 2111. Explorations in Chemistry**1 Credit (1)**

The major intent of this course is to deepen your interest in chemistry and make you aware of research and career opportunities in the field. During this semester we hope to discuss both old and new developments in chemistry that impact our lives. We also want to build our communication skills that are so necessary in our profession. Graded S/U.

CHEM 2115. Survey of Organic Chemistry and Laboratory
4 Credits (3+3P)

This course is a one-semester survey of organic and biological chemicals. Students will be introduced to nomenclature, molecular structure, properties, and reactions of hydrocarbons, alcohols, carbonyls, organic acids and bases, carbohydrates, lipids, and proteins. The handling of organic chemicals, simple organic reactions, tests for functional groups, and synthesis will be learned in the laboratory component of this course.

Prerequisite: C- or better in CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Identify common organic functional groups.
2. Translate between the IUPAC names and structures of simple organic molecules.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Predict physical and chemical behavior of organic molecules based on structure.
5. Synthesize several classes of organic compounds in the laboratory that were previously studied in the lecture component of this course.
6. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
7. Construct 3 dimensional models of organic compounds.
8. Understand and apply safety principles associated with Organic Chemistry laboratory operations and activities.
9. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
10. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.

CHEM 2120. Integrated Organic Chemistry and Biochemistry
3 Credits (3)

This course is a one- semester introduction to Organic Chemistry and Biochemistry designed for students in health and environmental occupations. The course surveys organic compounds in terms of structure, physical, and chemical properties, followed by coverage of the chemistry of specific classes of organic compounds in the biological environment. Students will apply course concepts to everyday organic and biological chemistry problems in preparation for careers in health and environmental fields.

Prerequisite: CHEM 1120G or CHEM 1215G.

Learning Outcomes

1. Identify and name basic organic compounds.
2. Construct/draw organic compounds from the names.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
5. Compare and contrast the function and location of the four bioorganic units and their macromolecules and cofactors.
6. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.
7. Discuss the pathways and functions of some of the cellular metabolic processes.
8. Recognize and describe metabolic cellular processes and macromolecular structure with respect to health and/or disease state

CHEM 2130. Organic Chemistry I
3 Credits (3)

This course is the first of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course includes theoretical, qualitative, and quantitative discussion of Organic Chemistry concepts, including but not limited to a review of electronic structure and bonding, acids and bases, stereochemistry, an introduction to organic compounds, isomers, substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols, mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance.

Prerequisite: CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Review properties of elements and molecules discussed in general chemistry (electronegativity, bonding, formal charge, octet rule).
2. Review chemical reactions discussed in general chemistry (products, reactants, balanced equations, byproducts).
3. Classify organic compounds and their properties by functional group, including substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols.
4. Use common and IUPAC rules of nomenclature to name organic compounds.
5. Review the structure and stability of compounds.
6. Comprehend the relationship between structure and reactivity.
7. Comprehend configurations of organic compounds (resonance structures, stereochemistry, isomers).
8. Interpret spectral properties and use in structure determination.
9. Correctly describe the four-five step synthesis of a simple organic molecule using reactions learned in the class.

CHEM 2135. Organic Chemistry II**3 Credits (3)**

This course is the second of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course will emphasize structure, main physical properties, chemical reactivity, and reaction mechanisms relating to alcohols, arenes and carbonyl compounds, as well as continued integration of mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance technique and analysis.

Prerequisite: CHEM 2130 or CHEM 313.

Learning Outcomes

1. Identify functional groups and other key features of different organic compounds.
2. Correctly name organic compounds using the proper nomenclature (IUPAC and common names).
3. Analyze relationships among molecular structure, chemical reactivity, physical and spectral properties.
4. Understand chemical reactivity and reaction mechanisms relating, but not limited to dienes, arenes, alcohols, ethers, amines, phenols, and carbonyl compounds, i.e. aldehydes, ketones, carboxylic acids and derivatives.
5. Write out correctly the mechanisms of electrophilic aromatic substitution, formation and hydrolysis of acetals and ketals, formation and hydrolysis of imines and enamines, conjugate addition of nucleophiles to α,β -unsaturated carbonyl compounds, Fischer esterification and hydrolysis of esters under both acidic and basic conditions, transesterification under acidic and basic conditions, amide hydrolysis under acidic and basic conditions, the aldol reaction and condensation, and the Claisen condensation/Dieckmann cyclization for examples that are different than those studied in class.
6. Relate structures to spectral properties, interpreting IR, thirteenC and oneH NMR.
7. Describe the six-seven step synthesis of a simple organic molecule using reactions learned in this class.
8. Convert the Fischer projection of a carbohydrate to its corresponding Haworth projection, or convert the Haworth projection of a carbohydrate to its Fischer projection.
9. Recognize derivatives of carbonic and phosphoric acids, alkaloids, carbohydrates, peptides, steroids, prostaglandins, aglycones, carbohydrate anomers, reducing sugars, waxes, fats, and oils.

CHEM 2991. Introduction to Research**1-3 Credits (3+9P)**

Techniques and procedures of chemical research. May be repeated for a maximum of 3 credits.

Prerequisites: 8 credits of chemistry and a 3.0 GPA in chemistry.

Learning Outcomes

1. Varies

CHEM 2996. Special Topics in Chemistry**1-6 Credits (1-6)**

Specific subjects in Chemistry. These subjects will be announced in the 'Schedule of Classes'. It may be repeated under different topics for a maximum of 12 credits.

Learning Outcomes

1. Varies

CHEM 303. Organic Supplemental Instruction I**1 Credit (1)**

Collaborative workshop for students in Organic Chemistry I. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 313.

CHEM 304. Organic Supplemental Instruction II**1 Credit (1)**

Collaborative workshop for students in Organic Chemistry II. Course does not count toward departmental degree requirements. May be repeated for a maximum of 2 credits.

Corequisite(s): CHEM 314.

CHEM 313. Organic Chemistry I**3 Credits (3)**

Nomenclature, uses, basic reactions, and preparation methods of the most important classes of aliphatic and aromatic compounds.

Prerequisite(s): C- or better in CHEM 1225G or CHEM 1226.

CHEM 314. Organic Chemistry II**3 Credits (3)**

An in-depth focus on reactions and mechanisms as they relate to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acid derivatives, an amines. May be repeated up to 3 credits.

Prerequisite(s): C- or better in CHEM 313.

Learning Outcomes

1. Identify several new functional groups and other key features of organic compounds
2. Interpret ^1H / ^{13}C NMR, IR, UV-Vis, and Mass spectrometry data and have the ability to correlate structural elements with spectral features
3. Understand the chemical reactivity and reaction mechanisms relating, but not limited, to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acids, and amines. Mechanistic highlights include: etherification, acetal formation / removal, alcohol oxidation, carbonyl addition reactions, enolate (and related) reactions, formation of carboxylic acid derivatives, and nucleophilic acyl substitution processes. Apply these mechanistic and reactivity considerations to these same groups when they appear as substructures in larger biologically-important molecules (e.g. carbohydrates, amino acids, and lipids).
4. Design concise, three to five step syntheses of simple organic molecules using reactions learned in both CHEM 313 and 314
5. Qualitatively assess stability, solubility properties, chemical reactivity, spectral properties, and potential reactions that would lead to preparation, simply via visual inspection of structure.

CHEM 315. Organic Chemistry Laboratory**2 Credits (6P)**

Techniques, preparative and analytical methods in organic chemistry. May be repeated up to 2 credits.

Prerequisite(s)/Corequisite(s): CHEM 314. Prerequisite(s): C- or better in CHEM 313 or consent of instructor.

CHEM 351. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

CHEM 357. Synthetic Inorganic Laboratory**2 Credits (6P)**

Explores synthesis and analysis of main group and transition metal inorganic compounds. Inorganic laboratory and spectroscopic techniques will be used.

Prerequisites: CHEM 356.

CHEM 371. Analytical Chemistry**4 Credits (2+6P)**

The fundamentals of quantitative chemical analysis.

Prerequisite(s): C- or better in CHEM 1225G or CHEM 1226.

CHEM 422. Environmental Chemistry**3 Credits (3)**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: ENVS 422

Prerequisite(s): CHEM 1225G and either CHEM 2115 or CHEM 313.

CHEM 424. Soil Chemistry**3 Credits (3)**

Same as SOIL/GEOL 424.

CHEM 430. Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy**3 Credits (3)**

Lecture course covering the basic four areas of Physical Chemistry at the advanced undergraduate level. Topics include: Statistical Mechanics, Thermodynamics, Kinetics, Quantum Chemistry, Group Theory, and Spectroscopy at the advanced undergraduate level.

Prerequisite: CHEM 1225G or 1226; MATH 1521G or higher; PHYS 2140 or PHYS 1320G.

Learning Outcomes

1. Students will master the theoretical basis and underlying laws governing Physical Chemistry (Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy) at the advanced undergraduate level of expertise. In particular, students will develop critical thinking and problem solving skills in the above four areas of Physical Chemistry.

CHEM 431. Physical Chemistry**3 Credits (3)**

Principles that govern the physical and chemical behavior of matter. May not be counted toward Bachelor of Science degree in Chemistry.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G; PHYS 1240G or PHYS 2240G or PHYS 2140 or PHYS 1320G.

CHEM 431 H. Physical Chemistry Honors**3 Credits (3)**

Same as CHEM 431. Additional work to be arranged.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G or MATH 1521H; PHYS 1240G or PHYS 2240G or PHYS 2140 or PHYS 1320G.

CHEM 433. Physical Chemistry I**3 Credits (3)**

Laws and theories underlying chemical phenomena.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G; PHYS 2140 or PHYS 1320G, or consent of instructor.

CHEM 433 H. Physical Chemistry I Honors**3 Credits (3)**

Same as CHEM 433. Additional work to be arranged.

Prerequisite(s): CHEM 1226 or CHEM 2226; MATH 1521G or MATH 1521H; PHYS 2140 or PHYS 1320G, or consent of instructor.

CHEM 434. Physical Chemistry II**3 Credits (3)**

Laws and theories underlying chemical phenomena.

Prerequisite: CHME 302 or CHEM 433.

CHEM 435. Physical Chemistry Laboratory**2 Credits (6P)**

Prerequisite: concurrent registration in CHEM 434.

CHEM 441. Advanced Research**1-3 Credits (3+9P)**

Investigation of chemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.

Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

CHEM 443. Senior Seminar**1 Credit (1)**

Discussions of current chemical research, impact of chemistry on society and/or ethics as applied to chemists. Each student will present a written and an oral report on an approved topic.

Prerequisite: CHEM 431 or CHEM 433.

CHEM 451. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

CHEM 455. Independent Studies**1-3 Credits**

Independent studies directed by consulting faculty.

Prerequisite: consent of instructor.

CHEM 456. Inorganic Structure and Bonding**3 Credits (3)**

Study of structure and bonding of inorganic elements with a focus on transition metals. An introduction to symmetry, group theory, and spectroscopy will be included. May be repeated up to 3 credits.

Prerequisite: (MATH 1521G or MATH 1521H) and C- or better in CHEM 314.

Learning Outcomes

1. Students will learn about inorganic coordination complexes with a focus on transition metals, and may include the main group and f-elements. Students will learn about inorganic nomenclature and to analyze complexes using Lewis acid-base concepts.
2. Students will learn bonding theories, including group theory and symmetry point groups. Students will learn introductory concepts in organometallic chemistry and electronic spectroscopy.

CHEM 471. Advanced Integrated Inorganic and Physical Chemistry Laboratory**3 Credits (9P)**

Laboratory course covering Inorganic and Physical Chemistry techniques at the advanced undergraduate level. Topics may include: Transition metal/Main group synthesis in air and air free environments, Period f-element synthesis, UV-Vis spectroscopy, FT-IR spectroscopy, NMR spectroscopy, Isothermal Titration Calorimetry.

Prerequisite/Corequisite: CHEM 430 and CHEM 315.

Learning Outcomes

1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 472. Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory**3 Credits (9P)**

Laboratory course covering Protein Biochemistry and Instrumental Analysis techniques at the advanced undergraduate level. Topics may include: Affinity-based protein purification, basic protein quantification, protein activity assay, multi-variant analysis, diode array UV/VIS spectroscopy, ICP-MS, absorption and emission spectroscopy, raman spectroscopy, fluorescence, and separation science (HPLC, GCMS). Includes data analysis lab.

Prerequisite: CHEM 371.

Learning Outcomes

1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 475. Central Concepts in Chemistry - Safety**1 Credit (1)**

Students will obtain university safety training plus departmental-specific safety guidelines for the research laboratory

Learning Outcomes

1. Students completing this course will be knowledgeable of all safety guidelines delineated by the University, College, and Department.
2. When possible accident case-studies will be incorporated within the curriculum.

CHEM 476. Central Concepts in Chemistry - Research Ethics**1 Credit (1)**

Students will complete Federal Agency (NSF, NIH, etc.) on-line training modules in responsible conduct in research and discuss relevant case-studies of research misconduct.

Learning Outcomes

1. Completion of this class will yield researchers fully aware of federal and professional guidelines regarding the ethical conduction and dissemination of data and conclusions.

CHEM 477. Central Concepts in Chemistry - Professional Development**1 Credit (1)**

Students will receive basic instruction in research dissemination strategies (presentations) and career planning.

CHEM 501. Central Concepts in Chemistry - Energy**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical energetics. These topics include: (1) basic thermodynamics concepts, (2) statistical thermodynamics (3) chemical equilibria, and (4) intermolecular interactions.

Learning Outcomes

1. Students completing this course will gain an understanding of chemical thermodynamics and equilibria as they relate to all areas of chemistry.

CHEM 502. Central Concepts in Chemistry - Structure**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) principles of chemical bonding and (2) organic, inorganic and biochemical structure determination.

Learning Outcomes

1. Students completing this course will understand the fundamental components of molecular interactions and their impact on molecular structure and function in all areas of chemistry.
2. In addition, they will learn the theory and practice of physical techniques used to determine molecular structure.

CHEM 503. Central Concepts in Chemistry - Dynamics**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) basic kinetic concepts, (2) fundamental gas phase kinetics (3) organic, inorganic and biochemical reaction mechanisms.

Learning Outcomes

1. Students who successfully complete this course will understand the fundamentals of chemical dynamics: from simple gas or solution phase reaction mechanisms to biomolecular interactions.

CHEM 504. Central Concepts in Chemistry - Measurements**3 Credits (3)**

This course will provide the students with a detailed examination of several topics in chemical measurements. These topics include: (1) spectroscopic, electrochemical and chromatographic techniques, (2) statistical methods of measurement and validation relevant to biomolecules, synthetic polymers and mixtures.

Learning Outcomes

1. The collection of quantitative data is central to all subdisciplines of chemistry.
2. Students completing this course will understand the basic principles of chemical measurements and the uncertainties inherently associated with those measurements.
3. They will also gain knowledge of tools available to minimize those uncertainties in data interpretation.

CHEM 507. Chemistry of the Elements**3 Credits (3)**

Discussion of the reactions and structures of inorganic compounds.

CHEM 510. Graduate Student Seminar**1 Credit (1)**

Research seminar for graduate students in Chemistry. Enrollment required each semester for all graduate students. Masters or Doctoral candidates presenting a research seminar enroll for a letter grade. All other participating students enroll using the S/U grading option.

Learning Outcomes

1. Graduate students will gain experience organizing a research presentation.
2. Graduate students will develop oral presentation skills.

CHEM 514. Organic Structure Determination**1-3 Credits (1-3)**

This course is made up of three independent modules of 1 credit each. May be taught in one, two or three modules. Module 1: Infrared Spectroscopy and Other Spectroscopic Methods, Applications of infrared spectroscopy to the structure determination of organic compounds. Module 2: Mass Spectrometry, Application of mass spectrometry to the structure determination of organic compounds. Module 3: NMR spectroscopy, Applications of NMR spectroscopy to the structure determination of organic compounds. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of module one, students will have a general understanding of the physical basis of infrared spectroscopy and molecular vibrations, be able to describe and use the frequency, shape and intensity of diagnostic absorptions in the IR spectra to correlate with common organic functional groups, recognize the utility of the fingerprint region of an IR spectrum to establish identity of small organic compounds, and integrate IR knowledge with other spectroscopic methods for the structure determination of small organic compounds.
2. By the end of module two, students will understand the basis of mass spectrometry as a tool for structure determination, have a general understanding of the different techniques commonly used for sample ionization, describe fragmentation patterns for common classes of organic compounds: alkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, ethers, amines and carbonyl compounds, use molecular ion and fragmentation pattern information to propose structures of small organic molecules, integrate mass spectrometry knowledge with other spectroscopic methods for the structure determination of small organic compounds.
3. By the end of module three, students will understand the physical basis of the nuclear magnetic resonance experiment and the relationship between nuclear and magnetic properties of atoms, describe and use the concepts of chemical and magnetic equivalence, chemical shift, and anisotropic effects in oneH NMR spectra, use information from homonuclear (oneH-oneH) and heteronuclear (oneH-thirteenC) coupling experiments to propose structures of small organic molecules, use information from twoD-NMR experiments (COSY, HMQC, HMBC, NOESY) to propose structures of small organic molecules including stereochemistry, integrate NMR knowledge with other spectroscopic methods for the structure determination of small organic compounds.

CHEM 515. Modern Organic Chemistry**3 Credits (3)**

Recent developments in synthesis and theoretical principles of organic chemistry.

CHEM 516. Physical Organic Chemistry**3 Credits (3)**

Physical organic chemistry.

CHEM 520. Comprehensive Literature Review Seminar for Graduate Students**1 Credit (1)**

Graduate student presents a literature review on an approved topic. The seminar presentation will include cover new developments of primary significance to the topic based on current research papers and culminate in a testable hypothesis. A passing grade allows the student to take the comprehensive exam.

Learning Outcomes

1. Student will prepare an abstract of their presentation understandable to a broad chemistry/biochemistry audience
2. Student will demonstrate a reasonable understanding of every concept introduced
3. Student will present a well-organized topic leading to a logical hypothesis
4. Student will demonstrate the ability to develop a data-supported hypothesis

CHEM 521. Chemical Instrumentation**3 Credits (2+3P)**

Theory and application of electronic devices to chemical analysis.

CHEM 526. Advanced Analytical Chemistry**3 Credits (3)**

Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.

CHEM 527. Separations**3 Credits (3)**

Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.

CHEM 529. Spectrochemical Analysis**3 Credits (3)**

Fundamentals, instrumentation, and applications of spectrochemical analysis.

CHEM 537. Quantum Chemistry**3 Credits (3)**

Fundamentals of quantum mechanics.

Prerequisite: consent of instructor.

CHEM 538. Chemical Kinetics**3 Credits (3)**

Empirical analysis of rate measurements, collision theory, transition state theory, and chain reactions.

CHEM 598. Special Research Programs**1-3 Credits**

Individual investigations, either analytical or experimental. Graded S/U.

CHEM 599. Master's Thesis**15 Credits**

Thesis preparation.

CHEM 600. Research**1-15 Credits**

Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

CHEM 619. Topics in Organic Chemistry**1-3 Credits**

Selected topics of current interest designated by subtitle.

CHEM 629. Advanced Topics in Analytical Chemistry**3 Credits (3)**

Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.

CHEM 639. Topics in Physical Chemistry**1-3 Credits**

Selected topics of current interest designated by subtitle.

CHEM 700. Doctoral Dissertation**17 Credits**

Dissertation preparation.

CHIN-CHINESE

CHIN 1110. Mandarin Chinese I**4 Credits (4)**

This is the first semester of a two-semester sequence in first year modern standard Chinese ("Mandarin"). This course is recommended for students who have had little or no experience in the Chinese language. A beginning Mandarin Chinese course is designed to introduce the Mandarin sound system ("pinyin"), basic vocabulary, Chinese characters (either in Simplified or Traditional characters), and basic grammatical concepts and structures. In order to help beginners develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course.

Learning Outcomes

1. Approach a novice-mid proficiency (ACTFL) in speaking, listening, reading, writing, as well as to develop their cultural awareness
2. Demonstrate knowledge of the phonetic system in Mandarin Chinese
3. Pronounce Chinese pinyin in correct tones
4. Demonstrate the mastery of the most commonly used characters (approximately 400-500)
5. Understand basic Chinese grammatical concepts
6. Use basic Mandarin vocabulary, introductory phrases and sentences in both oral and written forms
7. Understand greetings in China, countries and nationalities, Chinese family values, hobbies, and being someone's guest in China
8. Apply the language to greet each other, identify countries and nationalities, talk about his/her family, discuss important dates, talk about hobbies, and visit a friend in China
9. Develop basic reading and writing skills in Chinese 1
10. Develop initial understanding of Chinese culture, compare aspects of different cultures, make connections to their daily life, and build links among communities

CHIN 1120. Mandarin Chinese II**4 Credits (4)**

This is the second semester of a two-semester sequence in first year modern standard Chinese ("Mandarin"). This course is designed for students who have taken 1st Semester Mandarin Chinese, and focuses on enhancing pronunciation and expanding the vocabulary and grammar dealing with daily activities. In order to help beginners develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course.

Prerequisite(s): C or better in CHIN 1110.

Learning Outcomes

1. Maintain a novice-mid and approach a novice-high proficiency (ACTFL) in speaking, listening, reading and writing, as well as to enhance their cultural awareness
2. Demonstrate continued mastery of the four tones used in Mandarin Chinese
3. Demonstrate continued mastery of the most commonly used characters (approximately 500-600)
4. Apply basic grammatical concepts and structures, and begin exploring intermediate grammatical concepts
5. Demonstrate continued growth in vocabulary and expressions necessary for conversation in and about real life situations
6. Understand basic phone calls, discussion of studies, school life, shopping and transportation
7. Apply the language to make simple phone calls, discuss studies, talk about school life, go shopping and use transportation
8. Continue developing basic reading and writing skills in Chinese
9. Develop further understanding of Chinese culture, compare aspects of different cultures, make connections to their daily life, and build links among communities

CHIN 2110. Mandarin Chinese III**3 Credits (3)**

This is the first semester of a two-semester sequence in second year modern standard Chinese ("Mandarin"). This course is designed for students who have taken 1st and 2nd Semester Mandarin Chinese (or equivalence), and have a basic foundation on Chinese phonetics, characters, and grammars. In order to help students develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course. Restricted to Las Cruces campus only.

Prerequisite(s): C or better in CHIN 1120.

Learning Outcomes

1. Maintain a novice-high and approach an intermediate-low proficiency (ACTFL) in speaking, listening, reading and writing, as well as to enhance their cultural understanding
2. Pronounce the four tones used in Mandarin Chinese comfortably
3. Demonstrate continued mastery of the most commonly used characters (approximately 600-800)
4. Apply intermediate grammatical concepts and structures
5. Demonstrate continued growth in vocabulary and expressions in a variety for conversation in and about real life situations
6. Understand topics including but not limited to simple weather reports, dining, directions, birthday party stories, and seeing a doctor
7. Apply the language to talk about weather, order food, ask and give directions, describe birthday parties, and see a doctor (these are suggested topics, no intention to limit the topic range)
8. Continue developing paragraph-length reading and writing skills in Chinese
9. Deepen understanding of Chinese culture, compare aspects of different cultures, make further connections to their daily life, and build stronger links among communities

CHIN 2120. Mandarin Chinese IV**3 Credits (3)**

This is the second semester of a two-semester sequence in second year modern standard Chinese ("Mandarin"). This course is designed for students who have taken 1st, 2nd, and 3rd Semester Mandarin Chinese (or equivalence), and have a good foundation on Chinese phonetics, characters, and grammars. In order to help students develop their communicative competence in the four basic skills, the 5Cs (Communication, Cultures, Comparisons, Connections, and Communities) will be integrated consistently into the content and exercises in the course. Restricted to Las Cruces campus only.

Prerequisite(s): C or better in CHIN 2110.

Learning Outcomes

1. Maintain an intermediate-low and approach an intermediate-mid proficiency (ACTFL) in speaking, listening, reading and writing, as well as to strengthen their cultural understanding
2. Pronounce the four tones used in Mandarin Chinese fluently
3. Demonstrate continued mastery of the most commonly used characters (approximately 800-1000)
4. Apply more intermediate grammatical concepts and structures
5. Demonstrate continued growth in vocabulary and expressions in a variety for conversation in and about real life situations as well as simple academic settings
6. Demonstrate language skills that would help them travel or live in China
7. Understand topics including but not limited to dating, renting an apartment, sports, traveling, conversations at an airport
8. Apply the language to extend/decline invitations, rent an apartment, talk about sports, travel, check in and arrive at an airport (these are suggested topics, no intention to limit the topic range)
9. Continue developing multiple-paragraph-length reading and writing skills in Chinese I
10. Deepen understanding of Chinese culture, compare aspects of different cultures, make further connections to their daily life, and build stronger links among communities

CHIN 311. Advanced Chinese Language I**3 Credits (3)**

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

Prerequisite(s): Grade of C or better in CHIN 2110 and CHIN 2120.

CHIN 312. Advanced Chinese Language II**3 Credits (3)**

This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

Prerequisite(s): Grade of C or better in CHIN 311.

CHME-CHEMICAL & MATERIALS ENGR

CHME 101. Introduction to Chemical Engineering Calculations 2 Credits (2)

Introduction to the discipline of chemical engineering, including: an overview of the curriculum; career opportunities; units and conversions; process variables; basic data treatments; and computing techniques including use of spreadsheets.

Prerequisite/Corequisite: MATH 1220G.

Learning Outcomes

1. Describe career opportunities available to holders of a BSChE degree.
2. Find and use learning and advising resources within CHME and Engineering.
3. Create a course registration plan for future semesters that meets the degree and prerequisite requirements for the BSChE in the timeliest manner.
4. Diagram a process with unit operations and material and energy flows.
5. Perform unit analysis and unit conversions accurately and efficiently.
6. Validate calculated results using estimation techniques.
7. Apply the concept of significant figures to numerical answers.
8. Identify and describe process variable measurements using engineering vocabulary.
9. Express and convert concentrations using mass, mole, and volume bases. 1
10. Convert between absolute and relative pressure and temperature scales. 1
11. Perform calculations in Excel using built-in and custom functions. 1
12. Generate 2-D plots of data and functions in Excel. 1
13. Perform a regression of data to a mathematical model.

CHME 102. Material Balances

2 Credits (2)

Perform material balances in single- and multi-phase, reacting and non-reacting systems under isothermal conditions.

Prerequisite: MATH 1220G.

Learning Outcomes

1. Analyze data using trendlines. Linearize when necessary.
2. Use unit conversions when solving problems.
3. Turn a verbal or written problem statement into a diagram and a mathematical form.
4. Write and solve material balances on single and multi-unit processes, for both nonreactive and reactive processes.
5. Identify what phase a substance is in and then be able to use the correct equations to relate volume to mass and moles.
6. Use Raoult's and Henry's law when solving mass balances.

CHME 201. Energy Balances & Basic Thermodynamics

3 Credits (3)

Chemical Engineering energy balances; combined energy and material balances including those with chemical reaction, purge and recycle; thermochemistry; application to unit operations. Introduction to the first and second laws of thermodynamics and their applications. May be repeated up to 3 credits.

Prerequisite: CHME 102 and MATH 1250G.

Prerequisite/Corequisite: CHEM 1216 or CHEM 1215G.

Learning Outcomes

1. Correctly implement unit conversions (outcome (a) an ability to apply knowledge of mathematics, science, and engineering),
2. Analyze and solve elementary material balances on single and multi-unit process, for both nonreactive and reactive processes,
3. Apply the first law of thermodynamics to batch and flow processes,
4. Locate thermophysical property data in the literature and estimate properties when data are not available,
5. Conduct combined material and energy balances around continuous multi-unit processes with and without chemical reaction,
6. Perform process calculations using psychrometric charts, enthalpy concentration diagrams and steam tables,
7. Derive and solve differential equations for transient heat and material balances on dynamic systems.
8. Determine individual learning style and describe how learners of that style can help themselves,
9. Use modern engineering tools (example, Excel) to solve material and energy balance problems

CHME 303. Chemical Engineering Thermodynamics

4 Credits (4)

Applications of the First Law and Second Law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances. Modeling of physical properties for use in energy and entropy balances, heat and mass transfer, separations, reactor design, and process control.

Prerequisite: CHME 201.

Prerequisite/Corequisite: MATH 1511G.

Learning Outcomes

1. Use an engineering approach to solve a problem (identify scope, create diagram, determine knowns and unknowns, apply appropriate equations, calculate solutions and evaluate reasonableness of the solution)
2. Solve engineering problems using material, energy and entropy balances
3. Compile appropriate property data for chemical compounds and mixtures
4. Choose and solve appropriate equations of state
5. Use equilibrium relationships to solve chemical engineering problems
6. Acquire and apply new knowledge as needed, using appropriate learning strategies (maps to ABET Student Outcome seven) by analyzing a current environmental issue in chemical engineering

CHME 305. Transport Operations I: Fluid Flow**3 Credits (3)**

Theory of momentum transport. Unified treatment via equations of change. Shell balance solution to 1-D problems in viscous flow. Analysis of chemical engineering unit operations involving fluid flow. General design and operation of fluid flow equipment and piping networks. May be repeated up to 3 credits.

Prerequisite: CHME 201.

Prerequisite/Corequisite: MATH 1521G.

Learning Outcomes

1. Mathematical Solutions: solve applied math problems involving linear ordinary differential equations with boundary conditions; solve partial differential equations that can be analytically solved with boundary conditions; identify how coordinate systems are used with ODEs and PDEs; simplify second order PDEs with assumptions; identify when an analytical solution to a PDE is possible and when numerical methods are required.
2. Basic Fluid Concepts and Calculations: identify the properties of fluids, calculate problems that involve pressure measurements, fluid statics, and fluid kinematics; describe physical phenomena of fluid flow; define and explain viscosity, density, specific gravity, surface forces, velocity fields, Newtonian vs. Non-Newtonian, laminar flow, turbulent flow, Reynold's number, and other fluid motion topics.
3. Bernoulli and Energy Equations: apply the Bernoulli equation to sets of fluid problems; solve energy balances in the context of fluids and fluid motion, distinguish between approximations of and appropriate models for Bernoulli's Equation (i.e friction losses, x , pumps, compressors, turbines, surface forces, gas-liquid flow, non-Newtonian fluids, and the Moody diagram).
4. Momentum Analysis: apply momentum balances using the governing equations of momentum to solve one dimensional velocity profile problems of external or internal viscous fluid flow; interpret the different approximations of the momentum balance; classify differential vs. integral forms of momentum analysis; and calculate problems using the Navier Stoke's Equations.
5. Special topics: identify different turbo- and fluid-machinery; explain why computational fluid dynamics is important; solve problems using external flow with applications: boundary layers, lift, drag; and calculate problems with dimensional analysis methods.

CHME 306. Transport Operations II: Heat and Mass Transfer**4 Credits (4)**

Theory of heat and mass transport. Unified treatment via equations of change. Analogies between heat and mass transfer. Shell balance solution to 1-D problems in heat and mass transfer. Analysis of chemical engineering unit operations involving heat transfer. Design principles for mass transfer equipment. May be repeated up to 4 credits.

Prerequisite: CHME 305.

Prerequisite/Corequisite: MATH 392.

Learning Outcomes

1. Adopt a systematic problem solving approach, consistently and effectively.
2. Diagram heat flows for conductive, convective, and radiative processes.
3. Find and use material property values.
4. Convert and use appropriate units of energy, power, flux, etc.
5. Write conservation equations for planar, cylindrical, and spherical systems.
6. Apply assumptions such as steady state, number of dimensions, order of magnitude, and/or constant properties to simplify conservation equations.
7. Solve the energy conservation equation for the temperature distribution using appropriate boundary and/or temporal conditions.
8. Calculate heat fluxes into and out of a control volume.
9. Draw resistance circuits and calculate the overall heat transfer coefficient, U , for compound systems. 1
10. Calculate the temperature distribution, heat flux, efficiency, and effectiveness of extended surfaces such as fins. 1
11. Use lumped capacitance and exact solution models to solve transient heat transfer problems. 1
12. Calculate transport dimensionless numbers and explain what they represent. 1
13. Use fluid velocity profiles to calculate boundary layer shapes and thicknesses. 1
14. Calculate convection heat transfer coefficient, h , for external and internal flows using formulas and graphs of experimental results. 1
15. Explain the causes and relative magnitudes of free convection. 1
16. Calculate free convection coefficients using equations and experimental results. 1
17. Label key regimes and heat transfer features of boiling and condensation curves. 1
18. Compare and contrast parallel, cross, and countercurrent flow in heat exchangers. 1
19. Determine the needed surface areas and/or fluid flow rates for heat exchangers given unit operation or process energy needs. 2
20. Calculate and explain heat exchanger efficiency. 2
21. Predict likelihood and account for consequences of fouling. 2
22. Define radiation terminology such as blackbody, grey surface, emissivity, etc. 2
23. Relate surface temperature to radiation wavelength and energy. 2
24. Calculate the view factor between two surfaces and use it to calculate heat transfer. 2
25. Write and solve the mass and molar forms of the one-D mass conservation equations. 2
26. Calculate absolute and relative species velocities and fluxes. 2
27. Use heat transfer relationships and analogous equations to solve diffusion and advection mass transfer problems. 2
28. Predict which kind(s) of heat transfer will be relevant for a given situation. 2
29. Describe implications of problem solutions and perform additional "what if" calculations to understand patterns in the bigger picture.

**CHME 307. Transport Operations III: Staged Operations
3 Credits (3)**

Theory of mass transport. Mass transfer coefficients. Analysis of chemical engineering unit operations involving mass transfer and separations. Equilibrium stage concept. General design and operation of mass-transfer equipment and separation sequences. Restricted to Chemical Engineering Majors. May be repeated up to 3 credits.

Prerequisite: CHME 303, CHME 306.

Corequisite: CHEM 313.

Learning Outcomes

1. Determine which kind of separation (e.g., distillation, adsorption, membrane, etc.) is best suited to separate a particular mixture
2. Design various kinds of separation units to achieve a target flow rate and purity
3. Evaluate the cost effectiveness and energy requirements of a separation
4. Perform McCabe-Theile analysis
5. Include efficiencies and mass transfer effects in the design of separation units

**CHME 323 L. Transport Operations and Instrumentation Laboratory
2 Credits (6P)**

Laboratory experiments demonstrate the principles of process measurement and instrumentation through the determination of thermodynamic properties, transport phenomena properties, heat transfer, and material physical properties. Treatment of data includes regression techniques, analysis of error, and statistical analysis. Restricted to: Chemical Engineering majors. May be repeated up to 1 credit.

Prerequisite: I E 311.

Prerequisite/Corequisite: CHME 306.

Learning Outcomes

1. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework and to achieve the following.
2. Organize and carry out experimental design and actual hands-on experiments.
3. Understand safety regulations and safe operation procedures in the Chemical Engineering laboratory.
4. Be able to analyze and interpret experimental data with theories learned in previous courses.
5. Write organized and cohesive technical and reports.
6. Organize and prepare standard operating procedures.
7. Work effectively in a team environment.
8. Prepare and present technical works and answer questions.

**CHME 341. Chemical Kinetics and Reactor Engineering
3 Credits (3)**

Analysis and interpretation of kinetic data and catalytic phenomena. Applied reaction kinetics; ideal reactor modeling; non-ideal flow models. Mass transfer accompanied by chemical reaction. Application of basic engineering principles to design, operation, and analysis of industrial reactors. Restricted to: CHME, CMEG, CH E majors. May be repeated up to 3 credits.

Prerequisite: CHME 303, CHME 306.

Learning Outcomes

1. Perform mole balances in systems involving reactions.
2. Calculate conversion in batch and flow systems.
3. Size single and staged continuous-stirred tank, and plug flow reactors.
4. Develop rate laws from mechanisms and experimental data.
5. Calculate pressure drops and the effect on kinetics in packed-bed PFRs.
6. Apply the differential and integral methods of kinetic data analysis.
7. Maximize product selectivity for systems involving multiple reactions.
8. Understand effects of non-isothermal operation and unsteady-state behavior.
9. Apply rate limiting step and quantify performance in catalytic systems. 1
10. Quantify mass transfer limitations on heterogeneous systems. 1
11. Understand the idea of a residence time distribution, and the effect on reactor ideality.

**CHME 352 L. Simulation of Unit Operations
2 Credits (2P)**

Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover how to access variables, define and converge design specifications and converge tear/recycle streams. Restricted to: CHME majors. May be repeated up to 1 credit.

Prerequisite/Corequisite: CHME 307, CHME 441.

Learning Outcomes

1. Apply Aspen Plus programming solutions to specify and converge unit operations involving: non-rigorous balance units (RSTOIC, SEP, MIX, FSPLIT, SSPLIT DUPL); pressure changers (PUMP, COMPR, VALVE); pipe networks (PIPE, PIPELINE); heat exchangers (HEATER, HEATX); reactors and kinetic models (RPLUG, RCSTR, BATCH, REQUIL, RGIBBS); flash drums and decanters (FLASHII, DECANter); distillation columns (DSTWU, intro to RADFRAC)

**CHME 361. Engineering Materials
3 Credits (3)**

Bonding and crystal structure of simple materials. Electrical and mechanical properties of materials. Phase diagrams and heat treatment. Corrosion and environmental effects. Application of concepts to metal alloys, ceramics, polymers, and composites. Selection of materials for engineering design. May be repeated up to 3 credits.

Prerequisite: CHEM 1215G or CHEM 1216.

Learning Outcomes

1. Explain the effects of composition, bonding, structure, and defects on material properties.
2. Compute the response of materials to external influences.
3. Predict rates of materials failures.
4. Select materials for applications.

CHME 391. Industrial Employment**1-3 Credits (1-3)**

Employment in chemical, petroleum, food, biotechnology, materials, environmental, pharmaceutical, or other industry relevant to the discipline, with opportunity for professional experience and training in chemical engineering. Requires written report covering work period approved by employer. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Gain educational and work experiences that are directly related to the BSCE curriculum and the student's career goals.
2. Develop an understanding of the demands, responsibilities, and opportunities of professional employment.
3. Be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations.
4. Gain a better understanding of decision-making and implementation processes.
5. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 392. Numerical Methods in Engineering**3 Credits (3)**

Study and application of numerical methods in solving problems commonly encountered in engineering. MATLAB will be used as the working environment for implementing and performing the numerical methods in computers.

Prerequisite/Corequisite: MATH 1521G.

Learning Outcomes

1. Use MATLAB as a tool to solve chemical engineering problems;
2. Import and graph data using MATLAB;
3. Write and use script M-files and function M-files;
4. Understand the differences between script M-files and function M-files and why they are used in different situations;
5. Be able to translate algebraic equations into matrices, and use MATLAB to solve systems of linear algebraic equations;
6. Fit equations to data, obtain parameters, and determine the goodness of fit;
7. Linearize non-linear equations and obtain parameters for the nonlinear equations;
8. Use MATLAB to symbolically and numerically integrate one-dimensional integrals;
9. Solve systems of ordinary differential equations analytically (by hand); 1
10. Solve systems of ordinary differential equations numerically and analytically using MATLAB. 1
11. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 395V. Brewing Science and Society**3 Credits (3)**

An overview of the science of brewing and the interrelationships between society, technology, business, and the evolution of the current beer market. Topics covered are history of brewing and the interrelationships between societal attitudes, technology, and cultural preferences; beer styles and evaluation techniques; production and characteristics of ingredients used in brewing; brewing unit operations; biochemistry of malting, mashing, and fermentation; engineering in the brewery; homebrewing; and societal and health issues related to beer and alcohol. Students must be at least 21 years of age by the first day of instruction of the semester to enroll in this course.

CHME 412. Process Dynamics and Control**3 Credits (3)**

Process modeling, dynamics, and feedback control. Linear control theory and simulation languages. Application of Laplace transforms and frequency response to the analysis of open-loop and closed-loop process dynamics. Dynamic response characteristics of processes. Stability analysis and gain/phase margins. Design and tuning of systems for control of level, flow, and temperature.

Prerequisite(s): CHME 441.

CHME 423 L. Unit Operations Laboratory**2 Credits (6P)**

Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control systems with closed-loop process control, instrumentation and development of empirical models from process data. Includes written and oral reports. May be repeated up to 1 credit.

Prerequisite: CHME 307, CHME 441.

Corequisite: CHME 412.

Learning Outcomes

1. Understand and apply engineering experimentation techniques and safety procedures common to the chemical industry.
2. Apply principles developed in chemical engineering courses to the analysis of chemical engineering processes and unit operations.
3. Know the materials characterization methods.
4. Improve skills necessary for group work—interpersonal skills, coordination of the efforts of several persons, leader and subordinate roles, etc. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework.

CHME 448. Industrial Safety**3 Credits (3)**

An introduction to the fundamentals of chemical process safety, including toxicology, industrial hygiene, source models, fires and explosions, relief systems, hazard identification, risk assessment, environmental fate and transport, hazardous waste generation, pollution prevention, and regulatory requirements. May be repeated up to 3 credits.

Corequisite: CHME 323 L.

Learning Outcomes

1. Demonstrate a knowledge and understanding of the elements of process safety management.
2. Be able to pro-actively identify and analyze safety hazards.
3. Demonstrate knowledge and understanding of risk management tools, programs and processes associated with process safety.
4. Understand the OSHA PSM requirements.
5. Understand and appreciate the need for professional integrity and ethical decision making in the professional practice of engineering.
6. Demonstrate an understanding of issues encountered including business, environmental, health, safety and public interest issues.

CHME 451. Intellectual Property for Engineers and Scientists**3 Credits (3)**

An overview of intellectual property with an emphasis on patents. Terminology, patentability requirements, invention disclosures, inventorship, scope of claims, patent application content and the patent prosecution process, and post-allowance matters including infringement and enforcement. May be repeated up to 3 credits.

Learning Outcomes

1. Assess what kind of protection – patent, trade secret, copyright, trademark – is appropriate for particular intellectual property.
2. Describe relevant subject matter and standards for protection under patent, trade secret, copyright, and trademark.
3. Differentiate inventorship, authorship and ownership in an intellectual property context.
4. Devise search strategies to assess ‘prior art’ and public information that may affect availability of intellectual property protection.
5. Generate sample content for a patent application (including claims) and a trademark application.
6. Analyze office actions and propose solutions for issues raised during patent prosecution and trademark prosecution.
7. Compare and contrast the procedures for obtaining a patent, securing a trademark, registering a copyright and establishing trade secret protection.
8. Describe basic considerations relating to enforcement and infringement of intellectual property.

CHME 452. Chemical Process Design & Economic Evaluation**3 Credits (3)**

Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. May be repeated up to 3 credits.

Prerequisite: CHME 307, CHME 441.

Learning Outcomes

1. Write and explain the meanings of the basic equations related to engineering economic analysis.
2. Formulate mathematical models and solve problems involving process design and economic analysis.
3. Discuss the environmental, social, and economic implications of process design.
4. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 455. Chemical Plant Design**3 Credits (3)**

Design and analysis of integrated process plants. Consideration given to optimizing performance, operability, reliability, safety, control, energy integration, and cost effectiveness. Requires written report covering solution of a capstone design problem. Restricted to: CHME majors.

Prerequisite(s): CHME 452.

CHME 455 L. Chemical Plant Simulation**1 Credit (1P)**

Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control. May be repeated up to 1 credit.

Prerequisite: CHME 412, CHME 352 L.

Learning Outcomes

1. Understand how to input from the Aspen Plus Graphical User Interface (GUI).
2. How to specify unit operations in Aspen Plus.
3. Be able to perform a sensitivity analysis and an optimization.
4. Understand how to apply a design specification in Aspen Plus.
5. Understand how to use Calculator Blocks such as Fortran or Excel.
6. Be able to specify a catalytic reactor with LH kinetics.
7. Be able to optimize a RADFRAC distillation column on an economic basis.
8. Be able to converge complex multicomponent RADFRAC distillations.
9. Be able to use the economics analyzer package in conjunction with a simulation.

CHME 461. Calculation of Material and Molecular Properties**3 Credits (3)**

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CHME 561.

Prerequisite(s): CHEM 1226, MATH 1521G or MATH 1521H, (PHYS 2140 or PHYS 1320G).

CHME 464. Polymer Science & Engineering**3 Credits (3)**

This course covers concepts in science and engineering of macromolecules, such as synthesis and chemistry, characterization of molecular weight, morphology, rheology, and mechanical behavior, structure and property relationships, and polymer processing. Taught with CHME 564. May be repeated up to 3 credits.

Prerequisite: CHEM 313 or CHEM 2115.

Learning Outcomes

1. Describe the fundamental concepts in polymer science and engineering;
2. Analyze the microstructure and molecular weight of polymers;
3. Discuss the chemistry, importance and applications of natural polymers;
4. Interpret different synthesis methods of polymers;
5. Analyze the kinetics of polymerization;
6. Discuss the polymer rheology and viscoelastic behavior of polymers;
7. Explain the characterization and processing of polymers; and
8. Argue the selection of polymer and/or design a specific polymer for specific applications (through final project).
9. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 465. Rheology and Viscoelasticity**3 Credits (3)**

Navier-Stokes equation; non-Newtonian fluids; flow fields; rheometry; viscoelastic models; non-linear viscoelasticity; material functions; complex fluids, including emulsions, suspensions and nanocomposites. Taught with CHME 565. Consent of Instructor required.

Prerequisite(s): CHME 306.

CHME 467. Nanoscience and Nanotechnology**3 Credits (3)**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: PHYS 520. May be repeated up to 3 credits.

Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

CHME 470. Introduction to Nuclear Energy**3 Credits (3)**

Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology.

Prerequisite(s): CHEM 1215G, MATH 1521G or MATH 1521H.

CHME 471. Health Physics**3 Credits (3)**

Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis.

Prerequisite(s): MATH 1521G or MATH 1521H, CHME 470.

CHME 476. Nuclear Fuel Cycles**3 Credits (3)**

Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Consent of Instructor required.

Prerequisite(s): CHME 470.

CHME 478. Electrochemistry: Basics & Applications**3 Credits (3)**

Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.

Learning Outcomes

1. Understand the mechanisms responsible for electrochemical device.
2. Realize the current progress in electrochemistry.
3. Identify the problems and hurdles for electrochemical device practical applications.

CHME 479. Corrosion and Degradation of Materials**3 Credits (3)**

Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstructure on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories.

Prerequisite(s): CHME 361.

CHME 481. Biomedical Engineering and Engineering Healthcare**3 Credits (3)**

Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. May be repeated up to 3 credits.

Prerequisite: CHEM 1226.

Learning Outcomes

1. Solve problems related to the design of biomedical instruments.
2. Apply basic mathematics, biology concepts, and laws of physics and chemistry to solve biomedical engineering type problems.
3. Explain differences in biomedical research and industries.
4. Identify the current challenges in the field of biomedical engineering and predict what investigators and industries are doing to tackle such problems.
5. Critique biomedical engineering research through interpretation of peer-reviewed literature, formal presentations and formal reports.
6. Design a solution to a current biomedical engineering problem by computational modeling, experimental design, and/or researching a specific subject in biomedical engineering (i.e. reading peer-reviewed research articles/manuscripts/textbooks).
7. Engage in hands-on learning of biomedical devices such as the building of a simple flow-cytometer.

CHME 486. Biofuels**3 Credits (3)**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits.

Prerequisite: CHEM 313 or consent of instructor.

Learning Outcomes

1. Understand basic concepts about biomass derived energy;
2. Identify potential biomass feedstocks including energy crops;
3. Understand the concept of 1st generation, 2nd generation and advance biofuels;
4. Understand terminologies related to biomass conversion and biofuel production;
5. Have an understanding of the existing and emerging biomass to energy technologies;
6. Understand and apply mass and energy balances in biomass conversion;
7. Apply engineering thermodynamics, organic chemistry, chemistry of plant materials;
8. Familiarize with characterization of biomass feedstocks;
9. Understand the unit processes/ unit operations involved in biofuel/ bioenergy production; 1
10. Be able to do the basic engineering calculations related to biofuel production; 1
11. Understand the concept of a biorefinery system and be able to develop major unit operations of an integrated biorefinery; 1
12. Describe techno-economic analyses of biofuel conversion technologies; 1
13. Have an understanding of environmental implications; and 1
14. Apply biomass-derived energy in different applications.

CHME 490. Senior Seminar**1 Credit (1)**

Research seminar attended by graduate students is open to CHME undergraduates who are research active May be repeated up to 2 credits. Students must be in Senior Standing to enroll in this course.

Prerequisite(s)/Corequisite(s): CHME 498. Restricted to: CHME, CH E majors.

CHME 491. Special Topics**3 Credits (3)**

Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

CHME 495. Brewing Science & Engineering**3 Credits (3)**

Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll. Crosslisted with: FSTE 430.

Learning Outcomes

1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

CHME 495 L. Brewing Science & Technology Lab**1 Credit (3P)**

Brewing and brewing operations in a one-barrel brewery. Topics addressed will include brewery safety, characteristics and handling of brewing ingredients, recipe formulation, water treatment, wort preparation, fermentation, waste disposal, and packaging.

Corequisite(s): CHME 495.

CHME 498. Undergraduate Research**1-3 Credits (1-3P)**

Provides an opportunity for undergraduate students to work in research or areas of special interest such as design problems and economic studies under the direction of a faculty member. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Prepare a written research report conforming to the format of the CHME writing standard;
2. Articulate a clear research question or problem and formulate a hypothesis;
3. Identify and demonstrate appropriate research methodologies;
4. Define, articulate, and use appropriate terminology, concepts, and theory;
5. Use library and other tools to search for existing body of research relevant to their topic;
6. Know existing body of research relevant to their topic and explain how their project fits;
7. Identify and practice research ethics and responsible conduct in research;
8. Know and apply problem solving skills to constructively address research setbacks;
9. Work collaboratively with other researchers, using listening and communication skills; 1
10. Work autonomously in an effective manner, setting and meeting deadlines; 1
11. Reflect on own research, identifying lessons learned, strengths, and ways to improve; 1
12. Communicate confidently and constructively with graduate students, other researchers, and faculty; 1
13. Explain research to others in the field and to broader audiences through presentations; and 1
14. Articulate the relevance of their research to their coursework and professional future, synthesizing their research, academic, and professional interests and goals. 1
15. Criterion Three Student Outcomes specifically addressed by this course are NOT found in a mapping of outcomes against all CHME courses in the curriculum as this is a technical elective, not a required core course.

CHME 501. Graduate Thermodynamics for Chemical Engineers**3 Credits (3)**

Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics. Restricted to: CHME, CH E majors.

CHME 506. Graduate Transport Phenomena(s)**3 Credits (3)**

Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence.

CHME 516. Graduate Numerical Methods in Chemical Engineering**3 Credits (3)**

Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering.

CHME 542. Graduate Reactor Analysis and Design (s)**3 Credits (3)**

Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems.

CHME 548. Industrial Safety**3 Credits (3)**

Same as CHME 448 with graduate-level projects.

Prerequisite(s): CHEM 1216 or CHEM 1215G.

CHME 564. Polymer Science & Engineering**3 Credits (3)**

Synthesis, structure, property relationships of synthetic polymers. Taught with CHME 464. May be repeated up to 3 credits.

Prerequisite(s): CHME 201, CHEM 314.

CHME 565. Rheology and Viscoelasticity**3 Credits (3)**

This course is an introduction to rheology and viscoelasticity. In particular, the flow behavior of Non-Newtonian Fluids and Viscoelastic Fluids will be covered. Rheometry, the technique for characterization of fluids, will be discussed. Most of the course is quantitative and uses mathematical modeling. Taught with CHME 465.

Prerequisite(s): CHME 306.

CHME 567. Nanoscience and Nanotechnology**3 Credits (3)**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Taught with CHME 467.

Prerequisite(s): (CHEM 1225G or CHEM 1226) and (PHYS 1230G or PHYS 1310G).

CHME 578. Electrochemistry: Basics & Applications**3 Credits (3)**

Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.

Learning Outcomes

1. Understand the mechanisms responsible for electrochemical devices, realize the current progress and identify the problems that challenge the practical applications.

CHME 586. Biofuels**3 Credits (3)**

Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their compositions; types of biofuels; thermochemical and biochemical conversion technologies; assessment of economic, environmental and social sustainability; and emerging topics in biofuels research and development. Course includes a term paper related to biofuels. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic concepts about biomass derived energy;
2. Identify potential biomass feedstocks including energy crops;
3. Understand the concept of 1st generation, 2nd generation and advance biofuels;
4. Understand terminologies related to biomass conversion and biofuel production;
5. Have an understanding of the existing and emerging biomass to energy technologies;
6. Understand and apply mass and energy balances in biomass conversion;
7. Apply engineering thermodynamics, organic chemistry, chemistry of plant materials;
8. Familiarize with characterization of biomass feedstocks;
9. Understand the unit processes/ unit operations involved in biofuel/ bioenergy production; 1
10. Be able to do the basic engineering calculations related to biofuel production; 1
11. Understand the concept of a biorefinery system and be able to develop major unit operations of an integrated biorefinery; 1
12. Describe techno-economic analyses of biofuel conversion technologies; 1
13. Have an understanding of environmental implications; and 1
14. Apply biomass-derived energy in different applications.

CHME 590. Graduate Seminar**1 Credit (1)**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. May be repeated up to 6 credits. Restricted to: CHME majors.

CHME 594. Professional Communication in Chemical Engineering**2 Credits (2)**

Connections between interpersonal relationships and the effective communication of information. Strategies for formal and informal written and verbal communication in the context of presentations, interviews, reports and publications. Factors affecting non-verbal communication. Special focus will be given to understanding and adapting to the audience's perspective. 2 credits. Open to chemical engineering graduate students or by permission of instructor. This class will prepare you to communicate technical information effectively within a variety of contexts and to a variety of audiences. Class assignments will be partially based on current student needs such as preparing presentations for professional conferences, giving research progress reports, and writing research manuscripts. Restricted to: CHME majors.

Prerequisite(s): CHME graduate student standing.

CHME 595. Chemical Process Design and Business Analysis **3 Credits (3)**

Graduate chemical process design principles, emphasizing literature review, patent search, heuristics application, process simulation assistance to process creation, synthesis of reactor and separator trains, second-law analysis, heat and power integration, process equipment mechanical design specifications, process design optimization, cost accounting and capital estimation, annual costs, earnings, and profitability analysis.

Prerequisite(s)/Corequisite(s): CHME 506, CHME 516, CHME 542.

Prerequisite(s): CHME 452, CHME 455 L or equivalent.

CHME 596. Chemical Process Industries Research **1 Credit (1)**

Independent graduate-level chemical process design project development, literature search, and proposal/defense.

Prerequisite(s): CHME 595.

CHME 597. Advanced Chemical Process Industry Analysis **2 Credits (2)**

In-depth analysis and defense of a timely commercially-relevant chemical process design.

Prerequisite: CHME 596.

CHME 599. Master's Thesis **1-15 Credits (1-15)**

Thesis.

CHME 690. Graduate Seminar **1 Credit (1)**

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated up to 8 credits. Restricted to: CHME majors.

CHME 698. Ph.D. Research **1-9 Credits (1-9P)**

Advanced topics for current research. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.

Learning Outcomes

1. To make progress toward a PhD degree.

CHME 700. Doctoral Dissertation **1-9 Credits (1-9)**

Individual research in selected topics of current interest in chemical engineering. May be repeated up to 88 credits.

Learning Outcomes

1. Demonstrate skills in the (a) design of experiments or simulations, (b) collection of experimental/simulated data, (c) development of appropriate models, and (d) make appropriate use of those models;
2. Complete an independent research project, resulting in at least a thesis/dissertation and peer-reviewed journal article(s);
3. Defend original research in front of a panel of peers and experts;
4. Be knowledgeable of the contemporary issues that are relevant to their chosen area of research.

CHSS - COMM HEALTH/SOC SRVCS

CHSS 1110. Intro to Health & Community Services **3 Credits (3)**

This course offers a holistic and multidisciplinary approach towards health promotion, wellness and a healthy lifestyle. Emphasis is placed on the major problems/issues that have the greatest significance to personal and community health. Topics to be discussed include: nutrition, fitness, stress management, sexuality, drug education and others. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic foundations of community health –history, framework and present progress: Identify key historical advances, people and events in public health; Understand Healthy People 2020 goals and objectives; Understand the levels of prevention (primary, secondary, tertiary) of public health
2. Identify organizations that help shape community health and their role in promoting health: Governmental; Quasi-Governmental; Nongovernmental; Identify local resources/agencies focused on health and human services
3. Conduct research in public health: Identify major sources for public health research; Governmental websites; Journals; Interpret and evaluate public health resources for academic use; Write a basic journal article critique
4. Understand the history and function of the school health program: Identify components of a coordinated school health program; Identify and overcome barriers common to CSHP; Apply the CSHP to contemporary issues in child/adolescent health

CHSS 2510. Service Learning **4 Credits (4)**

Service Learning Experience in Human and Community Service: Exploration of contemporary social, civil, economic and ethical problems that require student participation in collaborative efforts within the community. Restricted to Community Colleges campuses only.

Prerequisite: PHLS 2110.

Prerequisite/Corequisite: PHLS 1110G, CHSS 1110, and PHLS 2120.

Learning Outcomes

1. Understand the importance of service learning in community building and civic participation.
2. Students will complete 120 hours of service learning experience with a collaborating community agency.
3. Compile and submit a list of detailed daily service learning activities including contact individuals, meetings attended, presentations, specific tasks accomplished or contributions to agency or community, new skills learned, trainings, and number of hours spent on each activity.
4. Design a service learning project incorporating the key elements of Public Health, and addressing a need in the community.
5. Provide an oral presentation and write a personal reflection of the service learning experience in class.
6. Practice critical thinking, decision making skills, and civic responsibility in promoting better health and general well-being.

CHSS 2511. Service Learning - Community Health Worker**1 Credit (1)**

Service Learning Experience in Community Health Work: Exploration of contemporary social, civil, economic and ethical problems that require student participation in collaborative efforts within the community. May be repeated up to 1 credit.

Prerequisite: PHLS 2110, consent of instructor.

Prerequisite/Corequisite: PHLS 1110G, CHSS 1110, and PHLS 2120.

Learning Outcomes

1. Understand the importance of service learning in community building and civic participation.
2. Students will complete 30 hours of service learning experience with a collaborating community agency focusing on Community Health Work.
3. Compile and submit a list of detailed daily service learning activities including contact individuals, meetings attended, presentations, specific tasks accomplished or contributions to agency or community, new skills learned, trainings, and number of hours spent on each activity.
4. Attend CHW trainings focused on community health including (but not limited to) chronic disease, environmental and mental health.
5. Provide an oral presentation and write a personal reflection of the service learning experience in class.
6. Practice critical thinking, decision making skills, and civic responsibility in promoting better health and general well-being

CJUS-CRIMINAL JUSTICE

CJUS 1110G. Introduction to Criminal Justice**3 Credits (3)**

This course provides an overall exploration of the historical development and structure of the United States criminal justice system, with emphasis on how the varied components of the justice system intertwine to protect and preserve individual rights. The course covers critical analysis of criminal justice processes and the ethical, legal, and political factors affecting the exercise of discretion by criminal justice professionals.

Learning Outcomes

1. Describe the history, structure and function of the criminal justice system in the United States.
2. Discuss the role of law enforcement, court systems, corrections, and security in maintaining social order.
3. Identify and describe crime causation theories, various measures of crime and their reliability and victimization theories.
4. Relate fundamental principles, concepts and terminology used in criminal justice to current events.
5. Apply basic analytical and critical thinking skills in evaluating criminal justice issues, policies, trends and disparities.

CJUS 1120. Criminal Law**3 Credits (3)**

This course covers basic principles of substantive criminal law including elements of crimes against persons, property, public order, public morality, defenses to crimes, and parties to crime. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the concepts of substantive criminal liability in the United States, including actus reus, mens rea, causation, concurrence, and parties to crime.
2. Define the differences between criminal law and civil law in the United States.
3. Demonstrate basic knowledge of legal terminology as it relates to criminal law.
4. Identify the elements of crimes against persons, property, public order and the administration of justice, public morality, and the inchoate crimes.
5. Describe the various defenses to crimes.

CJUS 1996. Special Topics in Criminal Justice**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated under different topics for a maximum of 6 credits.

Learning Outcomes

1. Varies

CJUS 2120. Criminal Courts and Procedure**3 Credits (3)**

This course covers the structures and functions of American trial and appellate courts, including the roles of attorneys, judges, and other court personnel, the formal and informal process of applying constitutional law, rules of evidence, case law and an understanding of the logic used by the courts.

Learning Outcomes

1. Explain the application of the Constitutional Amendments that apply to criminal justice.
2. Explain and describe the dual court system in the U.S. and how courts enforce the rule of law.
3. Identify and list the duties and requirements of the courtroom workgroup.
4. Describe courtroom procedures, rules of the court, and due process of law.
5. Articulate basic knowledge of the U.S. criminal court system.
6. Define legal terms.
7. Explain the use of discretion in criminal procedure.
8. Differentiate the role of courts of limited jurisdiction, courts of general jurisdiction, and the appellate courts in the processing of criminal cases.

CJUS 2140. Criminal Investigations**3 Credits (3)**

This course introduces criminal investigations with in the various local, state, and federal law enforcement agencies. Emphasis is given to the theory, techniques, aids, technology, collection, and preservation procedures which insure the evidentiary integrity. Courtroom evidentiary procedures and techniques will be introduced. Community Colleges only. (Note: students completing CJUS 2140 may not take CJUS 321.)

Learning Outcomes

1. Identify developments in investigation technology.
2. Identify common types of criminal investigations and their key components.
3. Apply proper crime scene investigative protocols.
4. Explain proper evidentiary gathering and handing procedures, and utilize various interviewing techniques.
5. Identify and compare different law enforcement agencies and the role they play in criminal investigations.
6. Describe proper collection, evidence preservation, documentation, and court presentation.
7. Develop effective search authorization.

CJUS 2150. Corrections System**3 Credits (3)**

This course introduces the corrections system in the United States, including the processing of an offender in the system and the responsibilities and duties of correctional professionals. The course covers the historical development, theory, and practice, as well as the institutional and community-based alternatives available in the corrections process.

Learning Outcomes

1. Describe the purposes of the corrections system and the issues facing the corrections system.
2. Explain the components of the corrections system and describe their functions.
3. Compare and contrast the different forms of correction practices.
4. Explain the goals of corrections, the different factors affecting the sentencing process, the legal rights of prisoners, and the issues concerning prison violence.
5. Explain the impact of reentry into society.
6. Identify the issues concerning capital punishment.
7. Describe the effectiveness of various correction programs on offenders.

CJUS 2160. Field Experience in Criminal Justice**3-6 Credits**

This course is designed to provide actual experience working for a criminal justice agency and the opportunity to apply criminal justice concepts and theory to a field situation. Students already working in an agency will complete an approved learning project while on the job.

Prerequisites: CJUS 1110G, prior arrangement and consent of instructor and a GPA of 2.0 or better in major.

Learning Outcomes

1. Obtain practical experience by observing, researching, and working in a criminal justice agency.
2. Apply the knowledge of principles, theories, and methods that were learned in the classroom to situation in which field experience will be devoted
3. Instill an understanding for general and specific problems that criminal justice agencies encounter on a daily basis.
4. Develop a professional work ethic and attitudes, including reliability, professional responsibility, and the ability to work cooperatively with others.

CJUS 2220. The American Law Enforcement System**3 Credits (3)**

This course covers the historical and philosophical foundations of law and order, with an in-depth examination of the various local, state, and federal law enforcement agencies and how they interact within the criminal justice system.

Learning Outcomes

1. Discuss, evaluate, and analyze the role of police in the democratic society today, and the historical development of modern day law enforcement
2. Define and explain the different types of community policing and the valid reasons behind their application within a community
3. List and discuss the ways to overcome the barriers to change within a police organization, good recruitment, screening, and retention of employees
4. Analyze and discuss the history of and the different types of police patrol, as well as the use of force and deadly force, and methods used for controlling police behavior
5. Describe and discuss the different types of police behavior, potential oversight, and remedy and their limitations
6. List and discuss the benefits of higher and continued education, along with the minimum educational requirements for police officers
7. Evaluate and discuss the reasons for police stress and the methods of dealing with stressors
8. Interpret current court cases, both state and federal, that affect police procedures

CJUS 300. Introduction to Criminal Justice Research**3 Credits (3)**

Overview and evaluation of criminal justice research. Selection of research topics, methods of data selection and collection, analysis techniques, and presentation of findings.

Prerequisite: restricted to majors or consent of instructor.

CJUS 301. Advanced Research Methods**3 Credits (3)**

Study of selected quantitative and qualitative skills and their application to criminal justice research.

Prerequisite: Restricted to majors or consent of instructor.

CJUS 302. Crime, Justice and Society**3 Credits (3)**

Through critical analysis students build a rich understanding of the role of crime in our contemporary landscape and explore ideas and practices associated with justice, victimization, criminality, morality and righteousness. The course cultivates knowledge & awareness of the interactions between socially constructed phenomena (race, class, power, ethnicity, economic structures) and popular beliefs, policies, and practices associated with crime, punishment, and formal social control. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G & ENGL 2130G. Restricted to: Criminal Justice majors.

CJUS 303. Introduction to Criminological Theory**3 Credits (3)**

Defining and measuring crime, crime causation, and the criminal behavior system, and their linkage to criminal justice policies, procedures, and practices. Students must be enrolled or have completed third English writing class and completed two of the following: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: C J majors.

Prerequisite(s): CJUS 300.

CJUS 304. Historical Perspectives of Criminal Justice Systems**3 Credits (3)**

Examines the precursors to and development of three distinct systems associated with crime and punishment in the United States: the Courts, the Police, & Corrections. By studying the historical context and socio-political backdrop in which these institutions emerged and expanded students will come to a richer understanding of them and their attendant policies, practices, conventions, and assumptions. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: Criminal Justice majors.

Prerequisite(s): CJUS 300.

CJUS 306. Criminal Procedural Law**3 Credits (3)**

Legal analyses of the rights of criminal defendants; legal duties and responsibilities of criminal justice personnel in the processing of criminal defendants. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 307. Law of Evidence**3 Credits (3)**

Evidentiary rules and concepts and their application in a criminal trial. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 321. Criminal Investigation and Intelligence**3 Credits (3)**

Principles of criminal investigation and intelligence production; processing cases from complaint through crime scene search, identification and collection of evidence, interviewing and interrogation, and case preparation for courts. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 331. American Correctional Institutions**3 Credits (3)**

Structure, organization, and operations of United States jails and prisons. Overview of correctional standards and classification systems, emphasizing current theory and practice.

Prerequisite: restricted to majors or consent of instructor.

CJUS 332. Correctional Law**3 Credits (3)**

Federal and state laws and rules of post-conviction procedures; rights of the convicted related to sentencing, appeals, clemency, and restoration of rights.

Prerequisite: restricted to majors or consent of instructor.

CJUS 333. Juvenile Corrections**3 Credits (3)**

Development and implementation of juvenile facilities and community programs. Effectiveness of current corrections practices. Restricted to majors.

CJUS 345. Victimology**3 Credits (3)**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system.

Prerequisite: restricted to majors or consent of instructor.

CJUS 346. Psychology and the Justice System**3 Credits (3)**

Analysis of psychological underpinnings of criminal behavior and the implications of these psychological principles for criminal justice policy. May be repeated up to 3 credits. Restricted to: C J majors.

Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 347. Sex Crimes**3 Credits (3)**

Dynamics of sex crimes for victims and offenders, plus consideration of the legal and correction systems' response to sex crimes. Restricted to majors.

CJUS 348. Serial Killers**3 Credits (3)**

Overview and critical assessment of serial homicide and its relevance for contemporary U.S. society. Focus on factors influencing definitions and cultural understanding of serial homicide.

Prerequisite(s): 60 credit hours.

CJUS 360. The Juvenile Justice System**3 Credits (3)**

History, development, and philosophy behind a separate juvenile justice system. Role of the juvenile court, evaluation of juvenile law and procedure, and the processing of juvenile offenders.

Prerequisite: restricted to majors or consent of instructor.

CJUS 380. Introduction to Terrorism**3 Credits (3)**

Overview of the phenomenon of terrorism, psychological and sociological theories of terrorism, and various contemporary governmental policies.

CJUS 391. Special Readings in Criminal Justice**1-3 Credits**

Individually chosen subject areas not readily available in other courses. May be repeated for a maximum of 6 credits under different subtitles. Restricted to majors.

Prerequisites: at least a 2.5 GPA and consent of instructor.

CJUS 393. Internship in Criminal Justice**1-12 Credits**

Field experience in a local, state, or federal criminal justice or private security agency. Includes orientation, observation, conferences, and work experience. Credits limited to six if student has taken CJUS 2160. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.

Prerequisites: consent of instructor and GPA of 2.5 or better.

CJUS 399. New Mexico Law**3 Credits (3)**

Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico.

Crosslisted with: POLS 399. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analyze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

CJUS 405. Juvenile Courts and Law**3 Credits (3)**

History, development, and current status of juvenile courts. Legal status of juveniles in court and constitutional protections afforded them.

Restricted to majors.

CJUS 410. Criminal Justice Administrative Systems**3 Credits (3)**

Administrative structures in criminal justice agencies and institutions; relationship of administrative structures to practical police, courts, and corrections problems.

Prerequisite: restricted to majors or consent of instructor.

CJUS 412. Introduction to Security Technology and Loss Prevention**3 Credits (3)**

Private and public responses to security problems, including employee theft, perimeter security, and domestic or foreign terrorism; reviews related law and management practices.

CJUS 414. Race, Crime and Justice**3 Credits (3)**

Historical and contemporary analysis of the relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 416. Global Perspectives on Youth and Drug Use**3 Credits (3)**

Overview of global drug use among young people, comparative legal structures, formal and informal responses. Restricted to C J, ANTH, GOVT, SOC, GNDR, S WK majors.

CJUS 417. Drugs In Our World**3 Credits (3)**

Comparative analysis of patterns and theories of drug use, formal government mitigation strategies.

CJUS 424. Forensic Law**3 Credits (3)**

Overview of the rules and issues related to the use of scientific information in the legal process. May be repeated up to 3 credits.

Restricted to: C J majors.

Prerequisite(s): C J major, Forensic Science minors, or consent of instructor.

CJUS 425. Issues in Ethics, Law, and Criminal Justice**3 Credits (3)**

Examination of the key ethical and decision-making dilemmas facing professionals working in the field of law and criminal justice.

Prerequisite: restricted to majors or consent of instructor.

CJUS 427. Race and Crime in Film**3 Credits (3)**

Critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

Prerequisite(s): 60 credit hours.

CJUS 428. Mexican-Americans and Issues of Social Justice**3 Credits (3)**

In this course we will explore and discuss social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."

Prerequisite(s): Students must have completed CJUS 300 or research methods equivalent or consent from the instructor.

CJUS 429. Immigration & Justice**3 Credits (3)**

This course is designed to introduce undergraduate students to the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

Prerequisite(s): Student must have completed CJUS 300 or Research Methods equivalent or consent of the instructor.

CJUS 430. The U.S. Supreme Court and the Criminal Justice System**3 Credits (3)**

History and workings of the U.S. Supreme Court in the context of the criminal justice system from writs of certiorari to last minute appeals in death penalty cases, including study of specific U.S. Supreme Court cases in the areas of criminal law, criminal procedural law, 8th amendment prison sentencing issues, and death penalty cases. Consent of Instructor required. Restricted to: Criminal Justice majors.

CJUS 431. Family Violence and the Law**3 Credits (3)**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

CJUS 432. Issues in Criminal Justice**3 Credits (3)**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated for unlimited credits under different subtitles.

CJUS 434. Probation, Parole, and Community Corrections**3 Credits (3)**

Structure, organization, and operation of probation, parole, and other community-based correctional programs in the U.S. Overview of historical and recent trends in the supervision of offenders in the community and in the development of alternatives to incarceration. Analysis of issues related to community correctional policies and practices. Restricted to majors.

CJUS 435. Political Penology**3 Credits (3)**

Comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

CJUS 436. Courts and Sentencing**3 Credits (3)**

This course will focus on the structure, organization, and operation of the state and federal court systems in the United States. It examines courtroom decision making and dynamics of courthouse justice—prosecutorial discretion, plea bargaining practices, jury and judicial decision making and sentencing. Additional topics will include racial, gender and class disparities in sentencing outcomes and the impact of recent reforms directed at the criminal court system. Restricted to: Criminal Justice majors.

CJUS 437. Wrongful Convictions**3 Credits (3)**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 440V. Comparative Criminal Justice Systems**3 Credits (3)**

Cross-national study of selected Western and non-Western legal systems. Comparison of structures and functions of police, court systems, and corrections in different systems.

CJUS 449. Senior Seminar**3 Credits (3)**

Problems and conflicts encountered in major attempts to control crime. Restricted to majors.

Prerequisite(s): CJUS 1110G, CJUS 1120, CJUS 2220, CJUS 2150, CJUS 2120, CJUS 300, CJUS 301, 90 credit hours completed.

CJUS 453. Women and Justice**3 Credits (3)**

Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors.

CJUS 454. Human Trafficking**3 Credits (3)**

Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, GNDR, S WK majors.

CJUS 455. Feminist Research Methods**3 Credits (3)**

Feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as GNDR 455.

CJUS 456. Police and the Community**3 Credits (3)**

This course is an advanced introduction to policing in the United States. The course will also cover current issues in policing, such as new technologies and the role of police in terrorism prevention.

Learning Outcomes

1. Describe the evolution of police community relations and community policing.
2. Compare and contrast traditional policing with community policing.
3. Examine discretion in police work and relate it to legal, operational, and ethical issues and problems.
4. Examine police misconduct and corruption.
5. Examine the importance of professionalism and ethics in police work.
6. Identify strategies for interacting with the physically and mentally disabled, the elderly, and crime victims.

CJUS 484. Hate Crimes & Groups**3 Credits (3)**

Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups, and social theories attempting to explain violent hate.

CJUS 501. Research Methods in Criminal Justice**3 Credits (3)**

Research design, methods of data collection and analysis, and preparation of research reports. Restricted to majors.

Prerequisite: C J major or consent of instructor.

CJUS 502. Statistics in Criminal Justice**3 Credits (3)**

Intermediate level statistical techniques applied to criminal justice data.

Learning Outcomes

1. Understand the basic statistical procedures for criminal justice research.
2. Use statistical software to enter and edit data, and conduct basic analysis.
3. Allow students the opportunity to recognize the critical role of empirical research in informing, influencing, and evaluating criminal justice practices and policies.
4. Developing a basic understanding of the role of statistics in criminal justice research.
5. Interpret and evaluate research evidence and statistical operations.

CJUS 511. Nature of Crime**3 Credits (3)**

Defining and measuring crime, crime causation, and criminal behavior systems. Restricted to majors.

Prerequisite: C J major or consent of instructor.

CJUS 514. Advanced Race, Crime, and Justice**3 Credits (3)**

Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 515. A Course on Punishment**3 Credits (3)**

Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system.

CJUS 520. Advanced Girls, Women & Crime**3 Credits (3)**

Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, GNDR majors. Crosslisted with: GNDR 520

CJUS 525. Issues in Ethics, Law, and Criminal Justice**3 Credits (3)**

Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors.

CJUS 527. Advanced Race & Crime in Film**3 Credits (3)**

Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

CJUS 528. Advanced Mexican-Americans and Issues of Social Justice**3 Credits (3)**

Advanced analysis of social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."

Learning Outcomes

1. Explore and discuss social issues related to the Mexican American community in the U.S.
2. Gain a better understanding of the history of the Mexican American experience in the U.S.
3. Understand current social justice issues impacting the Mexican American community.
4. Explore the Mexican American community experience particularly in the southwest.
5. Critically engage the challenges faced by the Mexican American community on issues such racial discrimination, racial profiling, immigration, and crime.

CJUS 529. Advanced Immigration & Justice**3 Credits (3)**

Advanced analysis of the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

CJUS 531. Advanced Family Violence and the Law**3 Credits (3)**

This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

CJUS 532. Advanced Issues in Criminal Justice (f, s, sum)**3 Credits (3)**

Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit.

CJUS 535. Advanced Political Penology**3 Credits (3)**

Advanced comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

CJUS 537. Advanced Wrongful Convictions**3 Credits (3)**

This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 541. Seminar in Criminal Justice Policy Analysis and Planning**3 Credits (3)**

Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and outcomes. Topics announced in the Schedule of Classes. Restricted to majors.

Prerequisite: C J major or consent of instructor.

CJUS 545. Advanced Victimology**3 Credits (3)**

Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes.

CJUS 555. Advanced Feminist Research Methods**3 Credits (3)**

Advanced feminist research practices and methodologies utilized in various disciplines. Definitions of research, what constitutes valid inquiry, how research can be feminist, and what it means to do interdisciplinary work. Same as GNDR 555.

CJUS 560. Juvenile Justice Systems**3 Credits**

Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. CJUS 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.

CJUS 581. Community Policing**3 Credits (3)**

Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.

CJUS 591. Directed Readings in Criminal Justice**3 Credits (3)**

Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.

CJUS 592. Independent Research**1-3 Credits**

Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.

CJUS 593. Internship**3-6 Credits**

Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisites: introductory graduate course in the area of the internship and consent of the internship supervisor.

CJUS 599. Master's Thesis**1-15 Credits**

Thesis.

COMM-COMMUNICATION

COMM 1115G. Introduction to Communication**3 Credits (1+2P)**

This survey course introduces the principles of communication in the areas of interpersonal, intercultural, small group, organizational, public speaking, mass, and social media. May be repeated up to 3 credits.

Learning Outcomes

1. Describe basic communication terms, forms and concepts.
2. Identify basic communication research methods and theories.
3. Explain the significance of ethics and diversity in communication processes.
4. Apply various concepts and skills in multiple communication contexts

COMM 1130G. Public Speaking**3 Credits (3)**

This course introduces the theory and fundamental principles of public speaking, emphasizing audience analysis, reasoning, the use of evidence, and effective delivery. Students will study principles of communication theory and rhetoric and apply them in the analysis, preparation and presentation of speeches, including informative, persuasive, and impromptu speeches. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate effective speech preparation.
2. Demonstrate effective speech delivery through use of language, nonverbal elements and the creation of presentation aids.
3. Analyze a potential audience and tailor a speech to that audience.
4. Evaluate presentations according to specific criteria.
5. Explain common propaganda techniques and logical fallacies, and identify them in the speeches of others.
6. Recognize diversity and ethical considerations in public speaking.

COMM 2110. Communication Theory**3 Credits (3)**

This course provides an exploration of major theories, concepts and methods of research in the study of human communication. May be repeated up to 3 credits.

Learning Outcomes

1. Identify, explain, and illustrate key concepts and principles of the major traditions of communication theory.
2. Analyze practical problems and situations using theories.
3. Integrate research correctly and ethically from credible sources to support the primary purpose of communication.

COMM 2111. Introduction to the Communication Major**1 Credit (1)**

This is a one-credit course for new Communication Studies majors. It helps them get acquainted with the department, the department head (professor for this course, the professors, other students, and the department student organizations. It also deals with degree mapping and career mapping and any problems the students are having in their first year. Finally, the students learn about the the Communication Studies discipline and various communication careers they can pursue with their degree. The class meets one day each week for one hour. Restricted to: Communication Studies majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. To give you some knowledge about your major and this department.
2. To help you learn more about the study of human communication in general and we approach it in our various courses.
3. To make you comfortable with the department, its professors and graduate students, as well as staff.
4. To assist you in finding important resources for earning your degree in Communication Studies with a high GPA.
5. To engage you and your concerns in earning your degree.
6. To advise you in ways that match your goals with the department goals.

COMM 2996. Special Topics**1-3 Credits (1-3)**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Define and describe key concepts and principles related to the group study or selected topic as identified by the course subtitle.
2. Apply key concepts and principles related to the group study or selected topic as identified by the course subtitle.

COMM 2997. Independent Study**1-3 Credits (1-3)**

Individualized, self-paced projects for students with a special interest in communication topics. Students must be sophomore standing to enroll. May be repeated up to 6 credits.

Prerequisite: COMM 1115G.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student will apply knowledge and understanding of the topic in a final paper or project.

COMM 305. Communication Research Methods**3 Credits (3)**

Introductory course in communication research. Emphasis on how to be an effective consumer of research. May be repeated up to 3 credits.

Learning Outcomes

1. Become an intelligent consumer of research: have the ability to read, comprehend, demonstrate understanding and critically evaluate communication and other research reported in scholarly journals and published documents as well as in the popular press.

COMM 310. Communication Theory and Discovery**3 Credits (3)**

The course explores the nature of communication science, major communication theories, and how communication research is conducted and interpreted.

Learning Outcomes

1. Understand philosophical underpinnings of communication theories and methods
2. Understand the relationship between theory and research methods in the field of communication
3. Apply concepts, theories, and research findings to various contexts outside of the classroom
4. Become an intelligent consumer of research: have the ability to read, comprehend, demonstrate understanding and critically evaluate communication and other research reported in scholarly journals and published documents as well as in the popular press.

COMM 351. Persuasion Theory and Practice**3 Credits (3)**

Training in understanding and applying the principles and techniques of argumentation and persuasion. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and explain key concepts and theories in persuasion
2. Apply concepts, theories, and research findings to various contexts outside of the classroom
3. Create persuasive messages utilizing principles from one or more of the theories covered in class
4. Become a critical consumer of persuasive messages and persuasive campaigns.

COMM 370. Organizational Communication**3 Credits (3)**

Communication strategies and patterns of private and governmental organizations, including research on the communication process. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the organizational theory, concepts, and research discussed in class and their implications for the field of organizational communication.
2. Explain the role communication plays in each of the organizational communication processes discussed in class.
3. Critically assess communication practices within all types of organizations.
4. Evaluate the ethical issues brought forth in organizational communication

COMM 376. Communication and Culture**3 Credits (3)**

Cultural and intercultural communication theory and behavior, with a concentration on the development of specific communication skills which should facilitate effective intercultural communication. May be repeated up to 3 credits.

Learning Outcomes

1. Define culture and other related concepts.
2. Explain processes of enculturation and acculturation.
3. Apply the concepts to one's own experience.
4. Create new ways of presenting material about culture and communication.

COMM 377. Conflict Management**3 Credits (3)**

Communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the role of communication in conflict and conflict management processes.
2. Analyze the components of conflict that lead to constructive or destructive communication patterns.
3. Evaluate the effectiveness and appropriateness of strategies, methods, and responses that are appropriate to a given conflict situation

COMM 384. Interpersonal Communication**3 Credits (3)**

Theories of interpersonal communication and relational communication including study of relevant models, contexts and constructs. May be repeated up to 3 credits.

Learning Outcomes

1. To define and describe communication and interpersonal communication.
2. To identify and describe concepts and behaviors related to nonverbal, verbal, relational, interpretive, role, self, and goal competence in the context of interpersonal communication.
3. To compare and apply concepts of interpersonal communication competence by reflecting on examples from communication in personal and everyday relationships.
4. To define, apply, and analyze concepts of family communication competence in media portrayals of, and in one's own experience of, family communication.
5. To define, apply, and analyze concepts of romantic communication competence in either a personal romantic relationship or in the example of a couple observed/interviewed.

COMM 425. Small Group Communication**3 Credits (3)**

Principles and methods of modern group discussion with emphasis on the role of the group in problem solving. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of group communication.
2. Become an intelligent consumer of group research literature.
3. Adopt and articulate a clearly developed communication perspective toward group research.
4. Gain an understanding of the within-group phenomena.

COMM 440. Political Communication**3 Credits (3)**

Presidential and congressional campaigns, political persuasion techniques, political advertising, power in language, and media aspects of political information. Ideology, resistance to political manipulation, and dependence of democracies on communication. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication.
3. Become informed and critical consumers of political messages and the news media.

COMM 450. Technologies of Human Communication**3 Credits (3)**

Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies.
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences.
3. Develop the ability to think about social media critically and analytically.
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal.
5. Articulate the benefits and drawbacks of living in a digital world.

COMM 457. Strategic Communication**3 Credits (3)**

This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the role and functions of Strategic Communication in a culturally diverse world.

COMM 460. Deception and Communication**3 Credits (3)**

Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation. May be repeated up to 3 credits.

Learning Outcomes

1. Students will acquire basic knowledge of research on Deception.
2. Students will be able to identify reasons for why people lie.
3. Students will be able to apply the course concepts to real world situations.
4. Students will be able to tell the difference between what is "true" and what is "false" about how we deceive in the popular press and movies/TV.
5. Students will learn about THE two theories in the area of Deception and be able to differentiate between them.

COMM 462. Family Communication**3 Credits (3)**

A communication perspective on traditional and nontraditional family configurations, roles, interaction patterns, and conflict. Includes an examination of media depictions of families and family interaction, as well as current social and political issues related to the family. May be repeated up to 3 credits.

Learning Outcomes

1. To develop a communication perspective on the family as a system.
2. To identify and distinguish between theories of family interaction.
3. To recognize and explain how family communication patterns and processes affect communication between family members.
4. To analyze communication processes that are unique to family subsystems such as romantic, parent-child, sibling, and extended family relationships.
5. To analyze the role of family interaction in the development and course of mental and physical health problems.
6. To analyze theories of family stress and the impact of specific family stressors on family interaction and well-being.
7. To apply theories and concepts to real-life scenarios.

COMM 465. Nonverbal Communication**3 Credits (3)**

Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process. May be repeated up to 3 credits.

Learning Outcomes

1. To analyze nonverbal channels of communication between persons, including channels such as the voice, face, eyes, posture, gestures, space, territory, clothing, paralanguage, and touch.
2. To analyze how nonverbal behaviors collectively communicate functions such as dominance, deception, intimacy, and turn-taking.
3. To analyze individual and social factors affecting the production of nonverbal behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships.
4. To analyze the origins of nonverbal communication, by examining developmental trends, continuities with other animal species, cultural similarities and differences, and physiological bases.
5. To examine applications of nonverbal research and theory to infant development, personality, gender, relational satisfaction, relationship development, culture, aging, and social media.

COMM 470. Leadership Communication**3 Credits (3)**

Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions. May be repeated up to 3 credits.

Learning Outcomes

1. Apply leadership concepts and theories.
2. Analyze leadership philosophies.
3. Identify the fundamental ways leadership is practiced in organizations.
4. Assess your own leadership traits and behaviors.
5. Develop your own personal leadership philosophy.

COMM 471. Sports Communication**3 Credits (3)**

This course provides a senior-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fandom and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 571. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 475. International Communication**3 Credits (3)**

Exploration of the forms and channels of communication is substantially influenced by international cultural and political factors. Covers: global communication technology; news, information, and entertainment flows; and international diplomacy and negotiation. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding of the history of international communications, and the issues and controversies that have appeared.
2. Demonstrate an understanding of the international agencies responsible for the regulation of media, including content, and technologies.

COMM 477. Environmental Communication**3 Credits (3)**

Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment. May be repeated up to 3 credits.

Learning Outcomes

1. Identify ways in which public discourses socially construct relationships between nature and humans
2. Demonstrate an understanding of critical and cultural approaches to environmental communication
3. Identify key issues in environmental conflicts, risk communication, and democratic participation in policy-making
4. Demonstrate an ability to critically evaluate environmental advocacy, deliberation, and public relations

COMM 478. Case Studies in Leadership Communication**3 Credits (3)**

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 479. Ethics & Diversity in Leadership Communication**3 Credits (3)**

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 480. Health Communication**3 Credits (3)**

Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of health communication theories and concepts.
2. Students will be able to apply theories and concepts to a real-world health issue.
3. Students will be able to differentiate among health communication theories and concepts.

COMM 485. International Teaching Assistant Development**3 Credits (3)**

International teaching assistants will receive instruction in communicative skills to enable them to meet their responsibilities at NMSU. Course includes lectures, seminars, video-taped presentations, and tutorial sessions emphasizing pedagogic and presentation skills and styles.

Prerequisite: consent of instructor.

COMM 490. Independent Study**1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students. Students must be in junior standing to enroll. May be repeated up to 6 credits.

Prerequisite: COMM 1115G.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 491. Selected Topics**1-6 Credits (1-6)**

Individual and/or group study of selected topics. To be identified by subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 495. Communication Internship**3 Credits (3)**

Internship opportunity to apply what has been learned to a real-world situation. Students must be in junior standing to enroll. Students must be in Junior or Senior Standing. May be repeated up to 6 credits.

Prerequisite: COMM 370.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 505. Research Methods**3 Credits (3)**

Seminar in the quantitative study of human communication phenomena, research design, and statistical analysis. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the logic of social science research.
2. Compare different research methods (experiment, survey, content analysis, and so on).
3. Develop and write clear hypotheses.
4. Understand how to assess the validity and reliability of measures.
5. Design a survey to test your hypotheses.
6. Use statistical analyses to answer questions in the field of communication.
7. Discuss the limitations of your study and the implications for your conclusions.
8. Become a better consumer of statistics and social science research.

COMM 506. Qualitative Research Methods in Communication**3 Credits (3)**

Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research. May be repeated up to 3 credits.

Learning Outcomes

1. Learn about the nature and application of qualitative research in social and organizational research.
2. Learn to conceptualize qualitative research and to formulate problem statements and research questions.
3. Learn how to design a qualitative research study.
4. Learn about qualitative data collection procedures—observation, interviews, focus group interviews, and collection and use of documents and archival data.
5. Apply research design and data collection skills by undertaking a pilot research study.

COMM 540. Seminar in Political communication**3 Credits (3)**

Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication
3. Become informed and critical consumers of political messages and the news media.

COMM 550. Seminar in Communication Technologies**3 Credits (3)**

Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences
3. Develop the ability to think about social media critically and analytically
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal
5. Articulate the benefits and drawbacks of living in a digital world

COMM 551. Seminar in Persuasion**3 Credits (3)**

Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects. May be repeated up to 3 credits.

Learning Outcomes

1. Become a critical consumer of persuasive messages and persuasive campaigns.
2. Create persuasive messages utilizing principles from one or more of the theories covered in class.
3. Apply concepts, theories, and research findings to various contexts outside of the classroom.

COMM 557. Seminar Strategic Communication**3 Credits (3)**

This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world. Graduate students will be required to fulfill advanced research and presentation requirements. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the role and functions of Strategic Communication in a culturally diverse world.

COMM 562. Seminar in Family Communication**3 Credits (3)**

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. Topics include basic family communication processes, communication in family subsystems, communication during family stress, and the role of family interaction in health and well-being. Students will explore how family relationships are built, maintained, and destroyed by communication as well as the potentially important and long lasting effects of family relationships on individuals.

COMM 565. Seminar in Nonverbal Communication**3 Credits (3)**

This course focuses on human physical behaviors as the basis of communication between persons. This physical behavior includes such variables as the voice, face, eyes, posture, gesture, space, territory, clothing, and touch. The content of the course considers the individual and social factors affecting the production of such behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships. Applications of research and theory in nonverbal communication to infant development, personality, sex differences, marital satisfaction, relationship development, culture, aging, and brain functioning are also studied throughout the course.

COMM 570. Seminar in Organizational Communication**3 Credits (3)**

Communication strategies and patterns of private and governmental organizations, including research on communication systems. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of organizational culture and communication.
2. Become an intelligent consumer of organizational culture.
3. Plan, design, execute, interpret, and/or critically evaluate the conclusions of an original organizational communication research project.
4. Adopt and articulate a clearly developed communication perspective toward organizational research.

COMM 571. Seminar in Sports Communication**3 Credits (3)**

This seminar provides a graduate-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fandom and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 471. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 576. Seminar on Communication and Culture**3 Credits (3)**

Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss the practical application of the study of culture.

COMM 578. Case Studies in Leadership Communication**3 Credits (3)**

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research. COMM 578 is the graduate version of COMM 478. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 579. Ethics & Diversity in Leadership Communication**3 Credits (3)**

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 583. Seminar in Theories of Communication**3 Credits (3)**

The theories covered in this course are intended to provide you with a foundational background for future graduate courses that will explore theoretical and topical areas of study in more depth. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how theories are developed, analyzed, evaluated, and applied.
2. Be able to assess, synthesize, and evaluate communication theories.
3. Gain a broad overview of the field of human communication theory.
4. Appreciate the diversity of theoretical ideas within communication literature.
5. Develop a deeper understanding through the exploration of selected topics.
6. Begin to solidify a theoretical stance of your own that will motivate and guide further studies.

COMM 584. Seminar in Interpersonal Communication**3 Credits (3)**

Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs. May be repeated up to 3 credits.

Learning Outcomes

1. To define interpersonal communication, explore relationship types, and analyze demographic trends in personal relationships
2. To examine the human need for interpersonal relationships, as well as social networks, the development of social skills, and the role of social support
3. To analyze how people develop and communicate their identity within relationships
4. To examine the role of communication in developing and maintaining relationships, with a focus on relational stages, turning points, dialectics, uncertainty, expectations, self-disclosure, affection, intimacy, influence, conflict, power, as well as cultural influences to close relationships.
5. To analyze relational hurt, relational transgressions, relational deterioration, and termination from a communication perspective.
6. To analyze and review current theory and peer-reviewed research in interpersonal communication.
7. To examine practical applications of interpersonal communication that have the potential to help or harm people, and to explore the gaps and links between theory and practice.

COMM 590. Independent Study**1-6 Credits (1-6)**

Individualized, self-paced projects. May be repeated up to 99 credits.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 591. Special Topics**1-9 Credits (1-9)**

Individual and/or group study of special topics. To be identified by subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 595. Communication Internship for Graduate Students**3 Credits (3)**

Internship opportunity to apply what students have learned to the real world. May be repeated up to 3 credits.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 598. MA Project**1-6 Credits (1-6)**

Project credits are used for the master's degree project option. May be repeated up to 6 credits.

Learning Outcomes

1. Propose and defend the project during the first semester.
2. Complete and defend the project during the second semester.

COMM 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Submit Thesis Proposal and defend the first semester of enrollment.
2. Complete Thesis and defend during the second semester of enrollment.

CSEC - CYBERSECURITY

CSEC 110. Principles of Cybersecurity**3 Credits (3)**

Course covers contemporary trends in cybersecurity including understanding characteristics of security vulnerabilities as they relate to hardware, software, data, procedures, and user actions. Restricted to Community Colleges campuses

Learning Outcomes

1. Explain the importance of cybersecurity in the global economy.
2. Explain why cybersecurity is a growing profession.
3. Explain how hackers use unsuspecting individuals to propagate risk
4. Explain why cybersecurity is critical to industry and public safety
5. Explain approach to cybersecurity.
6. Explain the characteristics of cyber warfare.
7. Explain trends in the cyber threat landscape.
8. Explain the framework of enterprise security solutions.

CSEC 127. Internet of Things Integration**3 Credits (3)**

Continuation of concepts taught in CTEC 127. Course expands on the importance of the Internet of Things (IoT) in society, control systems, communications, sensors, actuators, cloud computing, security, and databases. May be repeated up to 6 credits.

Prerequisite: CTEC 127.

Learning Outcomes

1. Demonstrate a detailed understanding of IoT.
2. Understand the societal impact of IoT.
3. Recognize challenges the IoT presents to security.
4. Develop an understanding of embedded programming language syntax and attributes.
5. Demonstrate assembly of electronic circuitry using a single-board computer.

CSEC 180. Introduction to Data Analytics**3 Credits (3)**

A broad introduction to the field of data analytics that prepares students to explore key areas of the analytical process of how data is created, stored, cleaned, visualized, and analyzed. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrate basic principles of data analysis using analytical tools.
2. Apply data analytics to contemporary workplace performance.
3. Describe how data is stored and accessed through relational database(s).
4. Use programming language(s) to analyze data.
5. Integrate application software to analyze and visualize simple dataset.

CSEC 275. Introductory to Cryptography**3 Credits (3)**

Introduction to the foundation of cryptography, principles behind cryptographic design, and cryptographic applications. Topics include encryption techniques, common cryptographic protocols and security functions.

Prerequisite(s)/Corequisite(s): MATH 1215 or above. Restricted to Las Cruces campus only.

Learning Outcomes

1. Describe the operations and benefits of cryptography
2. Able to understand necessary cryptography encoding
3. Able to use standard tools for penetration testing and compliance
4. Describe the basic need for cryptography and why it is essential for security.

CSEC 280. Introduction to Cyber Defense**3 Credits (3)**

Introduction to the foundation of cryptography, principles behind cryptographic design, and cryptographic applications. Topics include encryption techniques, common cryptographic protocols and security functions.

Prerequisite(s)/Corequisite(s): MATH 1215. Restricted to Las Cruces campus only.

CSEC 283. Ethical Hacking and Penetration Testing**3 Credits (3)**

Introduces students to the tools and software used in ethical hacking and penetration testing as well as introducing them to some of the vulnerabilities and exploits that exist within the cybersecurity field.

Prerequisite: E T 153 and E T 156.

Prerequisite/Corequisite: E T 283.

Learning Outcomes

1. Identify and describe common threats and vulnerabilities.
2. Describe/demonstrate how to secure a network.
3. Identify and demonstrate common tools used in ethical hacking/penetration testing.
4. Identify and describe legal/ethical issues pertaining to ethical hacking.

CSEC 285. Introduction to Managing Information Security**3 Credits (3)**

Managerial aspects of information security and assurance including access control models, information security governance, accountability metrics, legal responsibilities, and information security program assessment.

Prerequisite(s)/Corequisite(s): CTEC 290 or OECS 269. Restricted to Las Cruces campus only.

CSEC 286. Information Security Certification Preparation**4 Credits (4)**

Covers the examination objectives and detailed preparation to prepare students to take the CompTia Security+ exam.

Prerequisite: E T 153, E T 156, and E T 283.

Learning Outcomes

1. Identify and describe common threats and vulnerabilities.
2. Identify and demonstrate common security devices/programs.
3. Describe/demonstrate how to secure a network.

CSEC 295. Cybersecurity Capstone**3-4 Credits (3-4)**

Experiential hands-on learning applying skills and knowledge gained in technology and cybersecurity-related courses supporting contemporary workforce performance. May be repeated up to 8 credits.

Learning Outcomes

1. Evaluate technical components, systems and integrated systems.
2. Demonstrate individualized project-based skills.
3. Develop integrated system solutions.
4. Integrate cyber technology to support workplace performance.

CTEC-CYBER TECHNOLOGY

CTEC 115. TOPICS IN IT**1-3 Credits (1-3)**

Topics to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 120. IT Infrastructure Support I**1-3 Credits (1-3)**

Introduction to most common types of PC configurations, installations, and failures. This course will explore troubleshooting skills for maintaining and repairing common hardware and software related problems. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

CTEC 127. Introduction to Internet of Things**1-3 Credits (1-3)**

Exploration of the importance of IoT in society, components of typical IoT devices and future trends. IoT design considerations, constraints, interfacing and key components of networking will also be covered. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 130. Linux Workstation**1-3 Credits (1-3)**

Installation, configuration, and maintenance of the Linux operating system. Covers file organization, user management, and system security. Addresses general procedures for working with and modifying the operating system. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 135. Windows Workstation**1-3 Credits (1-3)**

Installation, configuration, and maintenance of the Windows operating system. Covers file organization, user management, and system security. Addresses general procedures for working with and modifying the operating system. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 140. Introduction to Database Design**1-3 Credits (1-3)**

Introduction to basic relational database concepts including terminology, tables, queries, forms, and reports. The course teaches data modeling concepts, building Entity Relationship Diagrams (ERDs), mapping ERDs, and use of data management system applications. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 145. Introduction to Database Management**1-3 Credits (1-3)**

Use of SQL to analyze complex business scenarios as well as to design and create, and manage databases. Course includes exposure to Application Express (APEX) to provide practical, hands-on activities. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): CTEC 140 or OECS 220.

CTEC 150. Mobile Application Programming**1-3 Credits (1-3)**

Introduction to elements of mobile application coding including concepts, design strategies, and tools needed to create, test, and deploy applications for mobile devices. May be repeated up to 6 credits.

CTEC 152. JAVA Programming**1-3 Credits (1-3)**

Introduction to concepts of programming in the Java language. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging code. This is a hands-on course that does not require students to have prior programming experience. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 154. C++ Programming**1-3 Credits (1-3)**

Introduction to concepts of programming in the C++ language. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging code. This is a hands-on course that does not require students to have prior programming experience. May be repeated up to 6 credits.

CTEC 156. Python Programming**1-3 Credits (1-3)**

Introduction to concepts of programming in the Python language. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging code. This is a hands-on course that does not require students to have prior programming experience. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 158. Visual Basic Programming**1-3 Credits (1-3)**

Introduction to concepts of programming in the Visual Basic language. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging code. This is a hands-on course that does not require students to have prior programming experience. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 180. Introduction to Networking**3-4 Credits (3-4)**

This course introduces the architecture, structure, functions, components, and models of the Internet and computer networks. Course includes the principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations to build simple LANs, perform basic configurations for routers and switches. May be repeated up to 8 credits. Restricted to Las Cruces campus only.

CTEC 185. Routing and Switching Essentials**3-4 Credits (3-4)**

This course covers the architecture, components, and operations of routers and switches in a small network. Students learn how to configure routers and switches for basic functionality. Course demonstrates how to configure and troubleshoot routers and switches to resolve common issues with RIPv1, RIPv2, single area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. May be repeated up to 8 credits.

Prerequisite(s)/Corequisite(s): CTEC 180 or OECS 261. Restricted to Las Cruces campus only.

CTEC 220. Internship**1-3 Credits (1-3)**

Work experience, directly related to a student's field of study, that provides an opportunity to explore career options while experiencing hands-on application, knowledge, and theory learned in the classroom. May be repeated up to 6 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Las Cruces campus only.

Prerequisite(s): (CTEC 120 or OECS 185) AND (CTEC 130 or OECS 204), AND (CTEC 180 or OECS 261).

CTEC 230. Introduction to Linux Server Administration**1-3 Credits (1-3)**

This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Linux Server(s). It provides in-depth, hands-on training for IT professionals responsible for the planning, implementation, management, and support of Linux Server operating system(s). May be repeated up to 6 credits.

Prerequisite(s)/Corequisite(s): CTEC 130 or OECS 204. Restricted to Community Colleges campuses only.

CTEC 235. Introduction to Windows Server Administration**3 Credits (3)**

This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Windows Server(s). It provides in-depth, hands-on training for IT professionals responsible for the planning, implementation, management, and support of Windows Server operating system(s).

Prerequisite(s)/Corequisite(s): CTEC 135 or OECS 207. Restricted to Las Cruces campus only.

CTEC 240. Fundamentals of Database Management**3 Credits (3)**

Exploration of database management using SQL and PL/SQL to extend and automate SQL in administering database systems. Students will create and work with projects which challenge them to enhance the SQL of a database solution for a business or organization. May be repeated up to 6 credits. Restricted to Las Cruces campus only.

Prerequisite(s): CTEC 145.

CTEC 245. Fundamentals of Cloud Based Data Systems**1-3 Credits (1-3)**

Introduction to the techniques and tools required to develop database driven web applications. The course teaches students how to design, develop, and deploy efficient and responsive, database-driven web applications using Oracle Application Express. Restricted to Community Colleges campuses only. May be repeated up to 6 credits.

Prerequisite/Corequisite: CTEC 240.

CTEC 255. Special Topics**1-3 Credits (1-3)**

Topics to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 280. Scaling Networks**3-4 Credits (3-4)**

This course covers the architecture, components, and operations of routers and switches in WLANs and complex networks. Students learn how to configure routers and switches for advanced functionality and to resolve common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks. May be repeated up to 8 credits.

Prerequisite(s)/Corequisite(s): CTEC 185 or OECS 262. Restricted to Las Cruces campus only.

Learning Outcomes

1. Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6
2. Describe the operations and benefits of the Spanning Tree Protocol (STP)
3. Configure and troubleshoot STP operations
4. Describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP)
5. Configure and troubleshoot basic operations of routers in a complex routed network for IPv4 and IPv6
6. Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6
7. Manage Cisco IOS® Software licensing and configuration files

CTEC 285. Connecting Networks**3-4 Credits (3-4)**

This course covers WAN technologies and network services required by converged applications in a complex network. Students learn about selection criteria of network devices, VLANs and WAN technologies to meet network requirements to resolve common issues with data link protocols. May be repeated up to 8 credits.

Prerequisite(s)/Corequisite(s): CTEC 280 or OECS 263. Restricted to Las Cruces campus only.

CTEC 290. Network Security**3-4 Credits (3-4)**

Fundamentals of design and implementation of network security solutions that will reduce the risk of system vulnerability. Topics include: threats, attacks, vulnerabilities, tools, architecture, design, access management, risk management, and cryptography. May be repeated up to 8 credits.

Prerequisite(s)/Corequisite(s): (CTEC 120 or OECS 185), AND (CTEC 180 or OECS 261). Restricted to Las Cruces campus only.

CTEC 295. Cyber Technology Capstone**3-4 Credits (3-4)**

Experiential hands-on learning applying skills and knowledge gained in computer and technology-related courses supporting contemporary workforce performance. May be repeated up to 8 credits.

Learning Outcomes

1. Evaluate technical components, systems and integrated systems.
2. Demonstrate individualized project-based skills.
3. Develop integrated system solutions.
4. Integrate cyber technology to support workplace performance.

CTEC 299. Independent Study**1-4 Credits (1-4)**

Specific subject to be determined based upon student need. May be repeated up to 8 credits. Restricted to Community Colleges campuses only.

CTFM-CLTHNG/TXTLS/FSHN MRCHDSG

CTFM 1110. Fundamentals of Fashion**3 Credits (3)**

Survey of the fashion business from fiber to end product.

Learning Outcomes

1. Describe the roles and functions of industry jobs and sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
2. Describe the business strategies of industry sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
3. Describe the interrelationships among line planning, line development, and line presentation at manufacturing and retail levels.
4. Provide examples of the fashion industry's environmental and social impact.
5. Learn about all career tracks involved in the fashion industry and the global fashion supply chain.
6. Synthesize industry-relevant information on current issues in the fashion industry.

CTFM 2120. Fashion Illustration**3 Credits (1+4P)**

This course explores aspects of fashion illustration, from drawing basic fashion figures to producing finished professional illustrations in color. This course provides the opportunity for students to integrate their fashion design development with computer-aided systems. The emphasis is on fashion innovation and concept design exploration enhanced by computer applications. May be repeated up to 3 credits.. Prerequisites: ARTS 1145G and CTFM 1110

Learning Outcomes

1. To learn Adobe Illustrator and Adobe Photoshop as drawing and design tools for electronic design and rendering.
2. To understand and utilize the computer as a tool for fashion design.
3. To understand methods of design input, including scanning, digitizing and resizing.
4. To develop customer profiles
5. To Understand Concept Style

CTFM 2130. Concepts in Apparel Construction**3 Credits (1+4P)**

Students are introduced to professional standard sewing techniques and apparel construction. The techniques learned are applied to produce finished garments. Restricted to: FCSE,CTFM majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Define sewing construction terminology, equipment and sewing machine parts.
2. Learn to select suitable patterns and fabrics for garments.
3. Learn to alter commercial patterns for different body types.
4. Identify fabric types, finishes, and labeling.
5. Perform standard operating procedures on sewing machines.
6. Perform clothing construction techniques for various garments.
7. Apply knowledge of industry sewing methods to recognition of garment workmanship.

CTFM 2990. Fashion Practicum**1-3 Credits (1-3)**

Applied field experience in the related areas of apparel design, fashion merchandising, and textile science. May be repeated up to 3 credits. Restricted to: CTFM majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Gain hands-on knowledge of the fashion industry.
2. Demonstrate the ability to analyze the practices of management, as observed in the industry.
3. Demonstrate an attitude that is appropriate for a prospective manager in the industry.
4. Demonstrate the understanding of, and the ability to use research and problem solving methods to develop, analyze, and present a critical incident analysis.

CTFM 300. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. Restricted to Las Cruces campus only.

Prerequisite(s): CTFM 1110; CTFM 2120.

CTFM 365. Apparel Analysis**3 Credits (3)**

An in-depth investigation of the development, production and comparison of wearing apparel. Focus on the structural, functional and decorative aspects of apparel. Emphasis on sourcing of companies and materials, costing of the product line, comparing design and manufacturing techniques that affect price, quality, and size of apparel. Restricted to: CTFM majors.

Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 366. Historic Fashion**3 Credits (3)**

The study of clothing styles from 3500 BC through the 20th century. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2120.

CTFM 371. Textile Science**3 Credits (1+4P)**

The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use, and care of textile goods. Restricted to: CTFM majors.

Prerequisite(s): CTFM 1110.

CTFM 372. Fashion Merchandising**3 Credits (3)**

A study of the processes required to bring consumer goods to the marketplace.

Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 373. Advanced Apparel Construction II**3 Credits (1+4P)**

This course builds on Basics of Apparel Construction and explores the application of advanced sewing technology across a range of fashion products. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2130.

CTFM 375. Fashion Buying**3 Credits (3)**

The application of planning, purchasing and controlling inventories using industry data and analytics. Includes merchandising math with an emphasis on product selection and pricing.

Prerequisite(s): ACCT 2110, CTFM 1110, and CTFM 2130.

CTFM 377. Fashion Study Tour**1-3 Credits (1-3)**

Study of international/domestic fashion, designers, manufacturers, merchandisers and/or retailers. May be repeated up to 6 credits. Consent of Instructor required.

CTFM 384. Clothing for Special Needs**3 Credits (3)**

Selection, adaptation, and design of clothing that is functional and attractive for special needs populations such as for active sportswear, the handicapped, the elderly, and various specialty populations.

Prerequisite: consent of instructor.

CTFM 401. Professional Development**1 Credit (1)**

Introduction to the field experience including resume writing, interviewing skills, understanding business ethics and etiquette. Also includes a discussion of career paths and advice from industry guest speakers. Restricted to: CTFM majors.

Prerequisite(s): CTFM 372 and CTFM 375.

CTFM 402. Field Experience**1-3 Credits (1-3)**

Practical experience in fashion, clothing design, manufacturing, merchandising, or retailing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CTFM majors.

Prerequisite(s): CTFM 401.

CTFM 403. Post-Field Experience**1 Credit (1)**

A case based approach to analyzing internship experiences. Students will share their experiences and prepare case studies about specific business issues they encountered during CTFM 402. Restricted to: CTFM majors.

Prerequisite(s): CTFM 402.

CTFM 460. Cultural Perspectives in Dress**3 Credits (3)**

Explores the social, psychological and cultural aspects of dress and appearance. Consent of Instructor required.

CTFM 473. Flat Pattern for Apparel Design**3 Credits (1+4P)**

Applied design principles to flat patterns techniques including bodies, skirts, sleeves, neckline, and bodies-sleeve combinations. Projects will require three-dimensional approaches in apparel design. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 474. Fashion Promotion**3 Credits (3)**

A comprehensive examination of promotion in the merchandising environment of fashion related goods. Restricted to: CTFM majors.

Prerequisite(s): CTFM 372.

CTFM 476. Draping for Apparel Design**3 Credits (1+4P)**

Development of garment shapes using draping techniques. Emphasis placed on torso development, contouring principles and design development on the form. This course exposes the student to the design process, from initial concept and muslin sample development to final execution of the finished garments. Restricted to: CTFM majors.

Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 477. Capstone in Fashion Merchandising**3 Credits (3)**

Synthesizes previous coursework. Students apply multi-disciplinary principles to the analysis of fashion merchandising case studies and industry related challenges.

Prerequisite(s): CTFM 372, CTFM 375 and CTFM 402.

CTFM 492. Special Problems**1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

CTFM 571. Textile Science**3 Credits (1+4P)**

The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use and care of textile goods. Students will be required to complete additional assignments beyond what is required for CTFM 371.

CTFM 598. Special Research Programs**1-4 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

DANC-DANCE

DANC 1110G. Dance Appreciation

3 Credits (3)

This course introduces the student to the diverse elements that make up the world of dance, including a broad historic overview, roles of the dancer, choreographer and audience, and the evolution of the major genres.

Students will learn the fundamentals of dance technique, dance history, and a variety of dance aesthetics. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. Explain a range of ideas about the place of dance in our society.
2. Identify and apply critical analysis while looking at significant dance works in a range of styles.
3. Identify dance as an aesthetic and social practice and compare/contrast dances across a range of historical periods and locations.
4. Recognize dance as an embodied historical and cultural artifact, as well as a mode of nonverbal expression, within the human experience across historical periods and cultures.
5. Use dance to consider contemporary issues and modes of thought.

DANC 1130. Ballet I

1 Credit (1)

This course is the beginning level of ballet technique. Students learn the basic fundamentals and performance skills of ballet techniques, which may include flexibility, strength, body alignment, coordination, range of motion, vocabulary, and musicality. May be repeated up to 2 credits.

Learning Outcomes

1. Apply fundamental movements of ballet techniques.
2. Enhance flexibility, strength, body alignment, coordination, balance, kinesthetic awareness, range of motion, and musicality.
3. Employ basic theories of classical ballet placement and proper alignment.
4. Develop basic ballet terminology, variations in timing and changes of facing, and barre and center combinations.

DANC 1131. Introduction to Ballroom Dance

1 Credit (1)

An introduction to ballroom dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Smooth and International Standard dances. Offered every Fall. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Ballroom dances in American and International styles
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Demonstrate improved overall physical capability, musicality, and movement memory
5. Appreciate Ballroom dancing as an artform and a discipline

DANC 1135. Introduction to Argentine Tango

1 Credit (1)

An introduction to Argentine Tango at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, as well as the history and culture of the form. Offered Spring of even years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of Tango and Argentine Tango
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Articulate the cultural and historical underpinnings of these forms as World dances
5. Demonstrate improved overall physical capability, musicality, and movement memory
6. Appreciate Tango as an artform and a discipline

DANC 1140. Flamenco I

1 Credit (1)

This course introduces the student to the art of flamenco and its cultural features and significance. Students will learn the fundamentals of this art form and introductory techniques and skills, which may include handwork, footwork, postures, and specific dances. May be repeated up to 2 credits.

Learning Outcomes

1. Demonstrate a basic level of competency in the principles of alignment, anatomy, coordination, mobility, stability, and stamina.
2. Demonstrate fundamental flamenco techniques relative to spatial awareness, rhythm, phrasing, and sequencing.
3. Demonstrate competency with basic flamenco movement vocabulary.
4. Perform a variety of flamenco dances, poses, steps, hand movements, and combinations.

DANC 1150. Modern Dance I

1 Credit (1)

Modern Dance techniques and styles. Students are introduced to proper warm-up techniques, body alignment, control and flexibility. Students work with various rhythms and combinations of movements. The course emphasizes dance technique and creative experience. The history, terminology and philosophy of Modern Dance are also discussed. May be repeated up to 2 credits.

Learning Outcomes

1. Use a more developed sense of muscle control and strength, stretch and balance, coordination.
2. Demonstrate and verbalize an increased awareness of Modern Dance techniques
3. Execute dance phrases, combining several movements and in more than one rhythm.
4. Demonstrate an increased awareness of musicality while dancing and use Modern Dance Techniques creatively.

DANC 1185. Introduction to Country Western Dance**1 Credit (1)**

An introduction to Country Western Dance at the beginning level. Students will learn the fundamentals of technique and several dances, including Country Western Two-Step, Nightclub Two-Step, Polka, and Line Dance. Offered Fall of odd years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Country Western social dances.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Country Western dancing as an artform and a discipline.

DANC 1220. Introduction to Latin Social Dance**1 Credit (1)**

An introduction to Latin social dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Rhythm and International Latin dances. Offered every Spring. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Latin dances in American and International styles.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Latin dancing as an artform and a discipline.

DANC 1235. Introduction to West Coast Swing Dance**1 Credit (1)**

An introduction to West Coast Swing dancing at the beginning level. Students will learn the fundamentals of technique of several Swing forms and the Hustle, including basic steps, partnering, and musical forms. Offered Fall of even years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of both West Coast Swing and the Hustle.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Swing dancing as an artform and a discipline.

DANC 2130. Ballet II**2 Credits (2)**

Intermediate level of ballet technique; Introduction of more advanced Ballet vocabulary at barre/center work; increase flexibility, strength, body alignment, and coordination for practice of steps/combinations with variations in timing and changes of facing. Restricted to Las Cruces campus only. May be repeated up to 8 credits.

Learning Outcomes

1. A successful student will be able to understand and execute with accuracy all the steps presented on the take home quizzes and are encouraged and expected to attend at least two semesters of each level in order to advance to the next level of ballet technique

DANC 2150. Modern Dance II**2 Credits (2)**

Modern II is designed to further the student's abilities in modern dance technique, to enhance efficient use of weight and momentum, to release held patterns in the body's mechanics, to enrich spatial awareness, and to begin work on performance techniques. May be repeated up to 8 credits.

Learning Outcomes

1. Improve accuracy in alignment and shape
2. Improve precision in space, in timing and rhythm, and in focus/intent
3. Learn combinations and movement dynamics quickly
4. Begin to integrate performance techniques while working in the classroom setting
5. Use a concentrated attitude and an open, creative mind to approach the work in an artistic manner unique to your abilities
6. Listen, see and apply all the information given within one class period and over the semester
7. Self-awareness and mindfulness: how much space do you take in the class and why? How aware are you of those around you, and those you are dancing with?
8. Release of weight to create controlled momentum
9. Locating center and moving from there

DANC 2157. Hip-Hop Dance**2 Credits (2)**

An introduction to hip hop dance and its relationship to other aspects of hip-hop culture, music, and media, with an emphasis on creativity, individuality, and expression. Coursework may include street styles, breaking, and various regional forms. No previous dance experience is expected. May be repeated up to 6 credits.

Learning Outcomes

1. Recognize and articulate the fundamentals of various styles of hip hop dance technique and vocabulary.
2. Contextualize the history and cultural aspects of hip hop dance.
3. Examine the relationship between dance and other aspects of hip hop culture such as music and media representation.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate hip hop dance as an artform and a discipline.

DANC 2270. Dance Improvisation**2 Credits (2)**

An introduction to the practice of dance improvisation focusing on play and discovery as methods for generating movement and exploring the full potential of the communicative, authentic body in motion. Course content includes concepts in Body, Effort, Shape, Space, Kinesthetic Response, Scoring, and Contact. Offered Spring of even years.

Prerequisite: DANC 1150.

Learning Outcomes

1. Understand the core concepts of exploration and authenticity and the importance of these ideas to a modern dancer and choreographer.
2. Demonstrate immediacy of presence, both physically and mentally, in the way that they responding to both choices and instincts in the moment.
3. Connect the concepts learned in Modern dance technique to the study of dance improvisation and the concepts of this class to outside work as dancers, students, and citizens.
4. Access the constantly expanding movement vocabulary which will inform their work moving forward in dance technique and composition.
5. Improvise confidently both individually and as part of a group.

DANC 2310. Bronze American Rhythm**2 Credits (2)**

Bronze level American Rhythm patterns, techniques, and partnering with emphasis on elements of dance. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in American Rhythm
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2311. Bronze American Smooth**2 Credits (2)**

Bronze level American Smooth patterns, technique, and partnering with an emphasis on the elements of dance. May be repeated up to 4 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in International Latin
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2320. Bronze International Latin**2 Credits (2)**

This is the style of Latin dance that is danced around the globe and is featured in the World DanceSport Championships. Students will learn the Bronze Level figures and techniques in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Material for the International Latin Syllabus
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance more advanced levels

DANC 2321. Bronze International Standard**2 Credits (2)**

This is the style of Ballroom dance that is performed around the globe and is featured in the World DanceSport Championships. Learn the Bronze Level figures and techniques in five (5) International Style dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on understanding technical elements of dance, memorizing and performing routines. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in International Standard
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2460. Dance for Musical Theatre**2 Credits (2)**

This course will supplement the dance technique curriculum specifically in support of the study of Musical Theatre. Students will practice various social, world, and theatrical dance forms, learn selections from iconic choreography, experience mock dance auditions, and explore the skill of dance composition for musical theatre repertory. Offered every Spring. May be repeated up to 4 credits.

Prerequisite: DANC 1130 or DANC 1160.

Learning Outcomes

1. Participate successfully in dance techniques and styles outside of the basic tap, jazz, ballet, and modern dance curriculum.
2. Recognize and contextualize musical theatre history and repertory through exposure to significant historical choreography and choreographers.
3. Understand and excel at the skill of taking part in a musical theatre dance audition.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate the practice of musical theatre dance as an artform and a discipline.

DANC 3110. DanceSport Pedagogy: Smooth
3 Credits (3)

In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in the four (4) American Style Smooth Ballroom Dances to include the Waltz, Foxtrot, Tango and Viennese Waltz. Students will gain practical teaching experience in the area of Group Class Instruction with required in class practicums. May be repeated up to 12 credits.

Prerequisite: DANC 2311.

Learning Outcomes

1. Students will understand several philosophies of teaching
2. They will gain teaching skills through practical experience.
3. The students will teach both group and private lessons.
4. The student will gain knowledge about learning styles.

DANC 3114. DanceSport Ensemble
1 Credit (1)

Involvement with the DanceSport performance ensemble rehearsal and performance process. May substitute for 1 credit of the Contemporary Dance Ensemble course in the Dance Major. May be taken in every semester of undergraduate study or for up to 8 hours credit. Students can enroll by audition only. Consent of the instructor is required. May be repeated up to 8 credits.

Learning Outcomes

1. Collaborate in the process of creating a work of Latin or Ballroom dance.
2. Participate in the process of producing a dance concert with fully realized technical elements including lighting and costumes.
3. Apply the knowledge and skills that are being developed in the study of dance technique, choreography, and pedagogy to the culminating performance experience.
4. Demonstrate a more developed sense of artistry, energy, ingenuity, and presence onstage.

DANC 3130. Ballet III
2 Credits (2)

The theory and practice of ballet technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. May be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.

Prerequisite: DANC 2130.

Learning Outcomes

1. Achieve a greater clarity of line, released use of turnout, and expressivity in port de bras and epaulement, demonstrating improved adagio and allegro skills at the advanced level.
2. Experience the idiosyncrasies of the Cecchetti, Vaganova, and Bournonville techniques and differentiate the Romantic, Classical, Neo-Classical, and Contemporary styles.
3. Apply experience from other disciplines such as modern dance to the exercise of ballet, referencing concepts such as body patterning and energy pathways.
4. Demonstrate an increased level of physical and artistic achievement and professionalism.

DANC 3150. Modern Dance III
2 Credits (2)

The theory and practice of modern dance technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. Course may be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.

Prerequisite: DANC 2150.

Learning Outcomes

1. Delve into movement concepts with a greater sense of risk and challenge at the advanced level.
2. Achieve an increased mastery of alignment, control, and efficiency, taking full advantage of the knowledge of body patterning and energy pathways.
3. Improvise solo, in an ensemble, and with a partner, demonstrating the application of instinct and choice in the authentic body.
4. Increase the student driven problem-solving skill that is essential to a professional modern dance artist.
5. Demonstrate a high level of physical and artistic achievement.

DANC 3250. Contemporary Dance Ensemble
1 Credit (1)

Involvement with the Contemporary performance ensemble rehearsal and performance process, which may include faculty or student-produced choreography, performance in up to 3 concerts per academic year, and travel to festivals or conferences. Course content will also include practical experience in theatrical production and design for concert dance. This course should be taken by dance majors for at least 4 semesters. May be taken in every semester of undergraduate study or for up to 8 hours credit. By audition only. Permission of the instructor is required. Course should be taken in conjunction with any Ballet or Modern Dance technique class. Student can enroll by audition only. Consent of the instructor is required. May be repeated up to 8 credits.

Learning Outcomes

1. Collaborate in the process of creating a work of concert dance.
2. Participate in the process of producing a dance concert with fully realized technical elements including lighting and costumes.
3. Apply the knowledge and skills that are being developed in the study of dance technique, choreography, and pedagogy to the culminating performance experience.
4. Demonstrate a more developed sense of artistry, energy, ingenuity, and presence onstage.

DANC 3265. Principles of Choreography I**3 Credits (3)**

An introduction to the basic tools of dance composition, beginning with improvisation and including body, space, time, energy, and elements of design. Offered Fall of even years.

Prerequisite: DANC 2270.

Learning Outcomes

1. Understand the core improvisational concepts of exploration, authenticity, instinct, and choice, and the importance of these ideas to a modern dancer and choreographer.
2. Connect the concepts learned in Modern I to the study of dance improvisation and composition and the concepts of this class to outside work as dancers, students, and citizens.
3. Build a constantly expanding movement vocabulary.
4. Recognize and use the basic components of dance composition- body, space, time, and energy- and explore the roles of invention and communication in the creation of contemporary dances.
5. Develop the communication skills necessary to articulate and defend academic and artistic choices and to give and receive feedback.
6. Begin building a body of creative work and developing a sense of personal values as an individual and as an artist.

DANC 3310. Silver American Rhythm**3 Credits (3)**

Silver level American Rhythm patterns and technique with emphasis on performance. May be repeated up to 9 credits.

Prerequisite: DANC 2310.

Learning Outcomes

1. To enhance advanced dance sport skills beyond Bronze Level

DANC 3311. Silver American Smooth**3 Credits (3)**

Silver level American Smooth patterns and technique with emphasis on performance. May be repeated up to 9 credits.

Prerequisite: DANC 2311.

Learning Outcomes

1. Advance introductory skill levels and enhancing technique towards Gold level

DANC 3320. Silver International Latin**3 Credits (3)**

Students will learn Silver Level syllabus figures in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and Bronze Level figures in Paso Doble. Continued training and practice in International Style Latin dance technique. May be repeated up to 9 credits.

Prerequisite: DANC 2320.

Learning Outcomes

1. Learn and work towards mastery for the four different styles of dances in Dance Sport

DANC 3321. Silver International Standard**3 Credits (3)**

Learn Silver Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on increased technical understanding to increase their ability in partnering and musicality. May be repeated up to 9 credits.

Prerequisite: DANC 2321.

DANC 3350. Dance Pedagogy I**3 Credits (3)**

This course will include discussion of human development, body patterning, teaching methods, the structure and analysis of course content, and educational values as they apply to teaching creative movement and dance technique. Student must have one semester each of ballet and modern technique or permission of the instructor to enroll. Offered Spring of odd years.

Prerequisite: DANC 2130 and DANC 2150.

Learning Outcomes

1. Understand the basic progression of human development and how the study of Creative Movement and Dance can aid in that development physically, cognitively, and emotionally.
2. Recognize basic sociological and developmental demographic factors and determine how to develop lessons that are appropriate, safe, and constructive.
3. Communicate clearly, assertively, thoughtfully, appropriately, and constructively, recognizing communication as a vital skill in education.
4. Expand upon an existing syllabus of terminology, rhythmic structures, and movement vocabulary that is necessary in a comprehensive elementary dance education.
5. Practice executing a basic dance class structure including short and long-term lesson plans and a variety of teaching methods.
6. Begin developing a system of personal values and a philosophy of education that will engender an effective, ethical, and responsible teaching practice.

DANC 3510V. World Dance**3 Credits (3)**

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HNRS 347V. May be repeated up to 3 credits.

Learning Outcomes

1. An understanding of the social importance of dance in diverse cultural settings
2. A familiarity with the importance of dance as a vehicle through which various identities (i.e. cultural, gender and personal), roles (i.e. social and status) and values (i.e., personal and cultural) are identified and expressed.
3. An understanding of dance as a form of non-verbal communication.
4. The ability to discuss and compare culture's dance forms.
5. The ability to recognize how other art forms, religions, and political climates affect cultural identity.

DANC 3610. Dance History**3 Credits (3)**

A survey of dance history from ancient Greece to the 21st century. Major emphasis on the development of dance as a Theatrical artform, on Ballet and Modern dance in Europe, Russia, and the U.S., and on criticism and theory of choreography and performance. Offered Fall of even years.

Learning Outcomes

1. Quantify factual knowledge of the progression of dance including primitive forms, court dance, ballet, and modern dance.
2. Recognize and contextualize important choreography, dancers, choreographers, composers, events, and phenomena in the history of Western Theatrical dance.
3. Discuss some of the root problems that dance historians face, such as the imperfect nature of documentation.
4. Understand how history shapes contemporary practices in dance.
5. Watch dance critically in order to derive choreographic intention and meaning in the work.
6. Articulate and support an informed point of view, both verbally and in writing, about works of concert dance.

DANC 3710. Somatics and Anatomy of Movement**3 Credits (3)**

This course combines the study of human anatomy and physiology with the principles of Somatics in various forms to address dance movement in terms of body connectivity, efficiency, and access to full physical capability. Student should complete one semester of Modern Dance technique before enrolling. Offered Fall of odd years.

Learning Outcomes

1. Understand the mechanics of basic human anatomy and physiology, including but not limited to bones, muscles, and joints, and explore the way that this quantitative knowledge can help in understanding and developing the dancer's kinesthetic ability.
2. Recognize the vitality of basic components of wellness, including nutrition and injury prevention and treatment, and the impact that these issues have on dance as a professional practice.
3. Integrate the basic principles of various somatic fields outside of ballet and modern dance technique into their personal artistic practice and understand the ways that these additional methods can enhance their physical capability.
4. Apply their knowledge of physiology, wellness, and somatic systems to the study and practice of dance pedagogy.

DANC 3720. Dance, Technology, and Design**3 Credits (3)**

This course explores the integration of technology into the creative process, focusing on projects in graphic design and filmmaking. Students will learn the fundamentals of photography, publicity design, sound editing and design, film documentation of live dance, and Dance for the Camera, and will be introduced to software including Photoshop and Final Cut. Offered Spring of odd years.

Prerequisite: DANC 3265.

Learning Outcomes

1. Demonstrate proficiency with some of the relevant technology, software, and tools that are used in producing digital images and video.
2. Effectively promote themselves and their work in their communities and online as 21st century artists and professionals must be prepared to do.
3. Think more broadly about the capabilities of their creative work, beginning with the choreographic process, with respect for the way that technology can enhance the artform of concert dance, and produce choreography in non-traditional formats.
4. Apply the skill of articulating specific and purposeful artistic choices, as is also being developed in technique, pedagogy, and composition classes.

DANC 4250. Dance Pedagogy II**3 Credits (3)**

The theory and practice of dance pedagogy focusing in greater depth on technique and branching into professional preparation, including dance studio management. Coursework will include application of somatic and anatomical principles and diverse teaching methods in many disciplines, plus the creation of a business plan and professional portfolio. Outside field experience in teaching dance technique will be required. Offered Spring of even years.

Prerequisite: DANC 3350.

Learning Outcomes

1. Demonstrate a deepening understanding of both theoretical and practical aspects of dance pedagogy, organizing the knowledge, skills, and artistic content of dance into effective, ethical, and responsible teaching practices.
2. Give and receive constructive critical feedback to and from their peers.
3. More effectively communicate with their students to answer questions and address concerns in the classroom.
4. Integrate artifacts, readings, and teaching tools which facilitate critical thinking and technical development in the dance class.
5. Prepare and implement a plan to establish and run a school of dance as a business.
6. Continue formulating an expanding system of educational values regarding the rights and responsibilities of the teacher, the student, and the institution.

DANC 4265. Principles of Choreography II**3 Credits (3)**

Using the tools introduced in Principles of Choreography I, students will explore new methods of generating movement, delving into language, rhythmic and musical studies, props and architecture, sources of inspiration, and meaning making. Students will also be guided to consider the integration of technical and theatrical elements into the choreographic process and the relationship between their artistic work and their personal and social values. Offered Fall of odd years.

Prerequisite: DANC 3265.

Learning Outcomes

1. Surpass the principles learned in Choreography I to create increasingly complex contemporary work, informed by new points of inspiration, broader subject matter, and greater relevance.
2. Demonstrate a deepening understanding of the choreographic process as an exercise in Meaning-Making, using an unlimited movement vocabulary applied with absolute clarity.
3. Articulate the choices in craft and intention that are the underpinnings for the creation of work that is reflective of the artist's personal and social values.
4. Create a wide and diverse body of work, utilizing multiple dancers, various styles of music, and varied creative processes.

DANC 4266. Advanced Independent Projects**1-3 Credits (1-3)**

Independent work in dance practice, pedagogy, composition, or theory under faculty guidance. Intended to allow the student to broaden their experience and expertise in an artistic or academic area of dance beyond the published coursework. This course may substitute for Special Topics within the dance major if a project of sufficient depth and rigor is proposed. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrate development in the skill of self-driven learning.
2. Apply strong practices of inquiry and discovery, developed in other cross-disciplinary coursework, to their own personal areas of research and creative interest.
3. Exhibit a deeper understanding of specific artistic, academic, or theoretical field within the study of dance, reflective of the student's goals and values.

DANC 4310. Gold American Rhythm**3 Credits (2+2P)**

Advanced level American Rhythm dance technique and partnering work with choreography and performance emphasized. Includes cultural history and pedagogy methods. May be repeated up to 6 credits.

Prerequisite: DANC 3310.

Learning Outcomes

1. To enhance dance sport skills beyond Silver Rhythm

DANC 4311. Gold American Smooth**3 Credits (3)**

Gold level American Smooth technique and choreography with an emphasis on performance and competition dancing. May be repeated up to 9 credits.

Prerequisite: DANC 3311.

Learning Outcomes

1. Continue to work towards mastery of dance sport perfection through advanced training

DANC 4320. Gold International Latin**3 Credits (3)**

Students will complete all syllabus figures through the Gold level in the Rumba, Cha Cha, Samba, Jive and Paso Doble. Advanced training and practice in International Style Latin dance technique. May be repeated up to 9 credits.

Prerequisite: DANC 3320.

DANC 4321. Gold International Standard**3 Credits (3)**

Students will learn Gold Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on physical and cognitive mastery of standard dance technique and elements as well as high-level performance ability, musicality and choreography. May be repeated up to 9 credits.

Prerequisite: DANC 3321.

DANC 4610. DanceSport Certification Preparation**3 Credits (3)**

The Professional Certification process offers extraordinary benefits to dance teachers, deeply enriching their dancing and teaching, and greatly expanding their career opportunities. This intensive course is designed to fully prepare students in taking the DVIDA and/or ISTD exams in the Smooth, Rhythm, Standard or Latin dances depending on course offered. See subtitle for specific style being taught in schedule of classes. May be repeated up to 12 credits.

DANC 4710. Senior Project**3 Credits (3)**

As a capstone to the undergraduate study of dance, majors will select a research topic of interest to them and use the information gathered to inform the choreographic or pedagogical process. The project will include both academic and creative components. Students must be in Senior standing. Consent of Instructor required.

Learning Outcomes

1. Synthesize the complete undergraduate study of dance technique, performance, pedagogy, and choreography.
2. Connect the practice of academic research to the choreographic or pedagogical process.
3. Demonstrate a reinforced understanding of dance as an art form and the essential practices of creation, communication, meaning making, and reflection.
4. Present a professional portfolio appropriate to a dance artist, including a cover letter, CV, resume, and statement of teaching philosophy.

DANC 4996. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

DANC 4997. Problems**1-6 Credits (1-6)**

Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

DAS-DENTAL ASSISTING

DAS 101. Introduction to Dental Assisting

2 Credits (2)

An introduction to the duties and responsibilities of a dental assistant. Includes brief lessons on head and neck anatomy, chair side assisting, sterilization techniques, dental office emergencies, and dental office management. Restricted to: Community Colleges only.

DAS 111. Bio-Dental Science

4 Credits (3+3P)

An introduction to biomedical and dental sciences with emphasis on head and neck anatomy and tooth morphology. Includes microbiology, general anatomy and physiology, histology and embryology of the oral cavity, pathology and pharmacology as they relate to dentistry.

Corequisite(s): DAS 113, DAS 115, and DAS 117.

Prerequisite(s)/Corequisite(s): PSYC 1110G, PHLS 1110G, and NUTR 2110. **Prerequisite(s):** ENGL 1110G, BIOL 1130, and (COMM 1130G or COMM 1115G). Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

DAS 113. Dental Assisting I

4 Credits (2+6P)

Introduction to chair side assisting procedures, instrumentation, infection control, equipment safety and maintenance, dental office emergencies, and management of pain and anxieties.

Corequisite(s): DAS 111, DAS 115, and DAS 117.

Prerequisite(s)/Corequisite(s): PSYC 1110G, PHLS 1110G, and NUTR 2110. **Prerequisite(s):** ENGL 1110G, BIOL 1130, and (COMM 1130G or COMM 1115G). Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

DAS 115. Dental Radiology

3 Credits (2+3P)

Radiation physics, hygiene, and safety theories. Emphasis on the fundamentals of oral radiographic techniques and interpretation of radiographs. Includes exposure of intra-oral radiographs, quality assurance, radiographic interpretation, patient selection criteria, and other ancillary radiographic techniques.

Corequisite(s): DAS 111, DAS 113, and DAS 117.

Prerequisite(s)/Corequisite(s): PSYC 1110G, PHLS 1110G, and NUTR 2110. **Prerequisite(s):** ENGL 1110G, BIOL 1130, and (COMM 1130G or COMM 1115G). Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

DAS 117. Dental Materials

3 Credits (2+3P)

Composition, chemical and physical properties, manipulation and uses of dental materials. Laboratory experiences include the application and manipulation of various materials used in dentistry.

Corequisite(s): DAS 111, DAS 113, and DAS 115.

Prerequisite(s)/Corequisite(s): PSYC 1110G, PHLS 1110G, and NUTR 2110. **Prerequisite(s):** ENGL 1110G, BIOL 1130, and (COMM 1130G or COMM 1115G). Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

DAS 123. Dental Assisting Practicum

6 Credits (1+15P)

This course is the clinical component of the program that combines general practice and experiences in the work place. Seminar topics focus on the practicum experiences and critique of performance. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

Prerequisite(s): DAS 111, DAS 113, DAS 115, and DAS 117.

Corequisite(s): DAS 125, DAS 127, and DAS 129.

DAS 125. Professional Concepts

3 Credits (3)

Emphasis on the development of professionalism for the dental office.

Includes oral communication, psychology, patient relations, problem-solving skills, stress management, and employability in addition to dental jurisprudence and ethics. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

Prerequisite(s): DAS 111, DAS 113, DAS 115, and DAS 117.

Corequisite(s): DAS 123, DAS 127, and DAS 129.

DAS 127. Dental Office Management

2 Credits (2)

This capstone course is an introduction to business office procedures, including telephone management, appointment control, accounts payable, completion of third party reimbursement forms, inventory control data entry for charges and payments, management recall, basic dental computer software and operating basic business equipment. Restricted to: OEDA majors. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

Prerequisite(s): DAS 111, DAS 113, DAS 115, and DAS 117.

Corequisite(s): DAS 123, DAS 125, and DAS 129.

DAS 129. Preventive Dentistry

2 Credits (2)

Prevention of dental diseases, oral hygiene instruction, fluoride, community dental health, and nutrition. Development, implementation and evaluation of a community dental health project. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

Prerequisite(s): DAS 111, DAS 113, DAS 115, and DAS 117.

Corequisite(s): DAS 123, DAS 125, and DAS 127.

DAS 130. Dental Assisting II

4 Credits (2+6P)

Continuation of chair side assisting skills and techniques with a major emphasis on four-handed dentistry. This capstone course includes specialties within dentistry and expanded chair side functions. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

Prerequisite(s): DAS 111, DAS 113, DAS 115, DAS 117, DAS 123, DAS 125, DAS 127, and DAS 129.

DAS 131. Dental Office Management I

3 Credits (3)

Introduction to the field of dental office management with emphasis placed on professional verbal and written communication skills utilized within the dental office. Content includes dental terminology, charting, and back office experience as they relate to dental reception and management.

Prerequisite(s)/Corequisite(s): DAS 101, AHS 120, and AHS 202.

Prerequisite(s): ENGL 1110G. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

DAS 133. Dental Office Management II

3 Credits (3)

Places emphasis on computer programs specifically designed for dental office management (Dentrix, Sof Dent, etc.) Expanded course content on oral communication and telephone skills, appointment scheduling, patient relations, stress management solutions, and comprehensive critical thinking/problem solving skills.

Prerequisite(s)/Corequisite(s): AHS 202. **Prerequisite(s):** ENGL 1110G, DAS 101, and AHS 120. Restricted to Alamogordo, Carlsbad and Dona Ana campuses.

DAS 155. Special Topics**1-6 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

DHYG - DENTAL HYGIENE/HYGIENIST

DHYG 110. Preclinical Dental Hygiene**3 Credits (3)**

Basic scientific principles and current theory, prevention of disease transmission, ethical and professional treatment of patients, clinical learning preparation, and introduction to comprehensive patient care. Offered concurrently with DHYG 112 to provide dental hygiene students with introductory knowledge, skills and attitudes to function in the clinical setting. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 112. Preclinical Dental Hygiene Lab**3 Credits (12P)**

Clinical application to basic theories and procedures used in dental hygiene practice. Techniques of instrumentation used in performing diagnostic, preventive and therapeutic services utilized when providing comprehensive patient care. Student will practice these techniques on manikins and student partners in the clinic. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 114. Oral Histology and Embryology**2 Credits (2)**

Introduction and description of general histology and embryology with emphasis on the microscopic structures of enamel, dentin, pulp, cementum, periodontal ligament, bone, oral mucosa, epithelial attachment and development of orofacial structures. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 116. Head and Neck Anatomy**3 Credits (3)**

Comprehensive study of the anatomy of the head and neck regions, including skeletal, nervous, circulatory, lymphatic, and muscular systems. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 117. Dental Anatomy**2 Credits (2+1P)**

A detailed study of nomenclature, morphologic characteristics, and physiologic relationships of human primary and permanent teeth as related to the clinical practice of dental hygiene. Laboratory activities develop observation and dexterity skills. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 118. Dental Radiology**3 Credits (3+4P)**

Study of radiation physics, hygiene and safety theories. Fundamentals of oral radiographic techniques and interpretation of radiographs. Includes exposure of intra-oral radiographs, quality assurance, radiographic interpretation, patient selection criteria, ancillary radiographic techniques and application to dental hygiene treatment. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 120. Dental Hygiene Theory I**3 Credits (3)**

Continuation of the theoretical basis for dental hygiene clinical practice. Emphasis on emergency care, planning dental hygiene care, health promotion and disease prevention, oral rehabilitation and care of appliances, modifications of dental hygiene care through the life-span, and an introduction to medically comprised patients. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 122. Clinical Dental Hygiene I**3 Credits (16P)**

Application of dental hygiene procedures on a variety of clinical patients under direct supervision of faculty. Emphasis on patient assessment and diagnosis, treatment procedures, appointment planning and prevention techniques. Theory is simultaneously related to practical experience. Offered concurrently with DHYG 120. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 124. General and Oral Pathology**3 Credits (3)**

Introduction to general pathology with focused study of diseases and disorders of the oral cavity and their interrelationship with body systems; developmental anomalies of the teeth and jaws; manifestations of disease in the oral cavity, head and neck. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 126. Periodontology**3 Credits (3)**

Study of normal and diseased periodontium to include the structural, functional and environmental factors. Emphasis on etiology, pathology, evaluation of disease, treatment modalities, and therapeutic and preventative periodontics relative to the hygienist's role as a co-therapist in a contemporary practice setting. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 132. Clinical Dental Hygiene II**2 Credits (2)**

Continuation of clinical skills, patient assessment and diagnosis, treatment and appointment planning, preventive techniques and application of dental hygiene procedures at an intermediate level under the direct supervision of faculty. Clinical-based instruction helps students synthesize new knowledge, apply previous knowledge, and gain experience managing the workflow. Theory is simultaneously related to practical experience. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

Prerequisite(s): "C" or above in DHYG 120, DHYG 122, DHYG 124, DHYG 126, DHYG 134.

Corequisite(s): DHYG 218.

DHYG 134. Dental Materials**3 Credits (2+2P)**

Study of the composition, chemical and physical properties, manipulations, and uses of dental materials. Emphasis on materials and procedures for which the dental hygienist is directly responsible. Laboratory experiences include application and manipulation of various materials used in dentistry. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 210. Dental Hygiene Theory III**2 Credits (2)**

Advanced theory of dental hygiene and information on periodontal therapies relative to the hygienist's role as a co-therapist in clinical practice. Continuation of the study of dental hygiene care for medically comprised patients and an introduction to special needs patients. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 212. Clinical Dental Hygiene III**4 Credits (16P)**

Continuation of clinical skills, patient assessment and diagnosis, treatment and appointment planning, preventive techniques and applications of dental hygiene procedures at the intermediate to competent level under supervision of faculty. Emphasis on dental hygiene treatment for the medically compromised and periodontally involved patients. Theory is simultaneously related to practical experience. Offered concurrently with DHYG 210. May be repeated up to 4 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 214. Dental Pharmacology**3 Credits (3)**

Study of the pharmacologic aspects of drugs and drug groups with which the dentist and dental hygienist are directly and indirectly concerned. Emphasis is placed on nomenclature, origin, physical and chemical properties, preparation, modes of administration and effects of drugs upon the body systems. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 215. Medical and Dental Emergencies**2 Credits (2)**

This course provides an overview of medical and dental emergencies encountered most frequently in the dental setting. It also provides the student with knowledge and techniques on how to address those emergencies should they occur. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 217. Research Methodology**2 Credits (2)**

This course provides an introduction to the principles and application of research methods in social, behavioral and medical research. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 218. Pain and Anxiety Management**2 Credits (2)**

Study of the application of various physical, chemical, and psychological modalities to the prevention and treatment of preoperative and postoperative patient anxiety and pain. Emphasis on administration of local anesthesia and nitrous oxide. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 219. Pain and Anxiety Management Clinical**1 Credit (4P)**

Clinical application of concepts learned in DHYG 218. Emphasis on the administration and techniques of local anesthesia and monitoring nitrous oxide. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

Prerequisite(s): DHYG 218.

DHYG 220. Dental Hygiene Theory IV**3 Credits (3)**

Theoretical preparation for advanced clinical practice. In-depth study of dental hygiene care for patients with special needs. Case Study presentations and a Board Review are utilized to demonstrate the synthesis of comprehensive dental hygiene knowledge, skills and attitudes. The most current dental and dental hygiene technology will be reviewed as it related to clinical practice. May be repeated up to 3 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 222. Clinical Dental Hygiene IV**4 Credits (16P)**

Clinical sessions combine basic and advanced dental hygiene skills with time management techniques essential for private practice. Comprehensive patient care to include assessment, dental hygiene diagnosis, treatment planning, implementation and evaluation of dental care, nonsurgical periodontal therapy, adjunct clinical procedures, ultrasonic instrumentation, patient management, sealants, and comprehensive programs for control of oral diseases will be emphasized. Theory is simultaneously related to practical experience. Students are encouraged to develop independent decision-making with minimal faculty supervision. May be repeated up to 4 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 224. Principles of Practice**2 Credits (2)**

Examination of the dental hygienist's role in both traditional and non-traditional employment settings. Career planning, resume preparation and interviewing are practices. An understanding of the law, professional ethics of dental hygiene and the need for lifelong learning are emphasized. Future roles of the dental hygienist and emerging issues in dental hygiene will be explored. May be repeated up to 2 credits. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 225. Dental Public Health Education**3 Credits (3)**

Study of principles and concepts of community public health and dental health education. Emphasis on dental epidemiology and statistical methods, community assessment, educational planning, implementation, and evaluation, scientific review of literature, and classroom presentation. Restricted to: DHYG majors. Restricted to Community Colleges campuses only.

DHYG 255. Special Topics in Dental Hygiene**1-6 Credits (1-6)**

Study of special topics related to the advanced practice of dental hygiene. May include educational methodology as well as applications in clinical practice, research, or community service. Consent of instructor required. Restricted to: Community Colleges only. Restricted to DHYG majors.

DMS-DIAGNOSTIC MED SONOGRAPHY

DMS 100. Introduction to Clinical Practicum**1 Credit (1)**

Introduction to working in the medical environment. Includes preparation for clinical internship and observation hours in the ultrasound department. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 101. Introduction Sonography/Patient Care**2 Credits (2)**

Introduction to the careers in sonography, terminology, medical ethics, scanning planes, applications of ultrasound, professional standards and patient care. May be repeated up to 2 credits. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 105. Introduction to Clinical Practicum II**1 Credit (1P)**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the developmental level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under direct supervision.

Learning Outcomes

1. Demonstrate proficiency in patient care skills.
2. Recognize sonographic anatomy.
3. Assist with basic sonographic procedures in the clinical setting.
4. Describe aspects of the clinical experience.

DMS 116. Vascular Technology I**2 Credits (2)**

Review of basic ultrasound physics and principles, peripheral vascular anatomy, hemodynamics, Doppler evaluation, peripheral vascular scanning techniques, physiologic testing and the carotid arteries and the peripheral vascular system. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 116 L. Vascular Technology I Lab**1 Credit (2P)**

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of the carotid arteries and peripheral vasculature utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 130. Pelvic Sonography**1 Credit (1)**

Includes the anatomy, sectional anatomy and normal physiology of the pelvic structures; including the uterus, ovaries, prostate, pelvic muscles, lower GI, appendix and vessels as well as scanning techniques, sonographic appearance and Doppler evaluation of the pelvis. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 130 L. Pelvic Sonography Lab**1 Credit (2P)**

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of the pelvic structures including the uterus, ovaries, prostate, lower gastrointestinal system, appendix and pelvic muscles utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 140. Abdominal Sonography**3 Credits (3)**

Includes the anatomy, sectional anatomy and normal physiology of prevertebral vessels, liver, biliary system, pancreas, upper gastrointestinal system, kidneys, adrenals, and spleen as well as scanning techniques, sonographic appearance and Doppler evaluation of the deep abdominal organs. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 140 L. Abdominal Sonography Lab**1 Credit (4P)**

Includes protocol development, scanning techniques, recognition of anatomical relationships and the normal ultrasound appearance of prevertebral vessels, liver, biliary system, pancreas, upper gastrointestinal system, kidneys and spleen utilizing real-time sonographic equipment including Doppler. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 150. Sonographic Principles and Instrumentation I**1 Credit (1)**

Includes the fundamental properties and mathematical relationships between variables of wave parameters, acoustic variables, attenuation, pulsed wave operation, transducers, system operation, Doppler, and artifacts utilizing real-time sonographic equipment. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 160. 1st Trimester Obstetric Sonography**1 Credit (1)**

Includes the embryology, anatomy, sectional anatomy, normal physiology, biometrics, assessment, and sonographic appearance of the 1st trimester fetus, placenta, uterus and adnexa as well as scanning techniques according to recognized protocols. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 165. 2nd/3rd Trimester Obstetric Sonography**1 Credit (1)**

Includes the anatomy, sectional anatomy, normal physiology, biometrics, assessment, and sonographic appearance of the 2nd and 3rd trimester fetus, placenta, uterus, and adnexa as well as scanning techniques according to recognized protocols. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 170. Clinical Practicum I**1 Credit (8-10P)**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the developmental level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under direct supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Develop professional skills necessary in the clinical environment.
2. Perform basic sonographic procedures with minimal assistance from preceptors.
3. Assist with complex/advanced sonographic procedures under the guidance of preceptors.

DMS 180. Clinical Practicum II**4 Credits (4)**

Development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at the beginner level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continue observation, assistance and performance of patient care and sonographic duties under direct supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

Prerequisite: DMS 170.

Learning Outcomes

1. Students will demonstrate general and sonographic knowledge to function as a member of the healthcare team.
2. Students will identify and interpret data from patient charts.
3. Students will perform a broad range of general sonographic examinations with minimal to moderate assistance.
4. Students will demonstrate effective oral and written communication skills.

DMS 201. Applied Sonographic Procedures**1 Credit (8P)**

Advances scanning skills, system optimization, anatomic recognition of abdominal and pelvic structures utilizing real-time sonographic equipment including Doppler. Includes sonographic evaluation of the first trimester pregnancy and normal fetus. Restricted to: DMS majors. Restricted to Las Cruces campus only.

DMS 216. Vascular Technology II**2 Credits (2)**

Includes the pathology and pathophysiology of the vascular system, scanning techniques, clinical presentation, ultrasound appearance and Doppler evaluation seen with pathological conditions of the carotid arteries, deep and peripheral vascular systems. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 226. Sonographic Case Studies I**1 Credit (1)**

Includes integration of didactic knowledge, clinical presentation, laboratory values, sonographic appearance and related medical imaging of a variety of pathological conditions through a variety of case analysis and presentations. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 227. Sonographic Case Studies II**1 Credit (1)**

Continuation of DMS 226, integration of didactic knowledge, clinical presentation, laboratory values, sonographic appearance and related medical imaging of a variety of pathological conditions through a variety of case analysis and presentations. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 230. Gynecologic Pathology**2 Credits (2)**

Includes the pathology and pathophysiology of the female reproductive system, scanning techniques, clinical presentation, ultrasound appearance and Doppler evaluation seen with pathological conditions of the uterus, ovaries, and adnexa. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 240. Abdominal Pathology I**2 Credits (2)**

Includes the pathology and pathophysiology of abdominal structures of the prevertebral vessels, liver, biliary system, pancreas, spleen and gastrointestinal system; scanning techniques, ultrasound appearance, clinical presentation and Doppler evaluation seen with pathological conditions. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 245. Abdominal Pathology II**2 Credits (2)**

Includes the pathology and pathophysiology of abdominal structures of the genitourinary system, spleen, retroperitoneum, adrenal glands, abdominal wall and prostate; scanning techniques, ultrasound appearance, clinical presentation and Doppler evaluation seen with pathological conditions. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 248. Pediatric Sonography**2 Credits (2)**

Includes the anatomy of the brain, skull, spine, hips, and normal developmental changes as well as pathology and pathophysiology of specific conditions that affect the premature infant, newborn and pediatric population across a variety of body systems. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 250. Sonographic Principles and Instrumentation II**3 Credits (3)**

Includes properties of sound and its use in diagnostic imaging, artifacts, system operation, Doppler, basic hemodynamics, image optimization, bio effects, quality assurance, and new technologies in ultrasound imaging. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 260. High Risk Obstetric Sonography**3 Credits (3)**

Includes congenital malformations of the developing fetus, high risk pregnancies, multiple gestation, maternal conditions and invasive procedures. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 270. Clinical Practicum III**3 Credits (32P)**

Continued development of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at an intermediate level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under limited supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Consistently demonstrate professional skills and etiquette in the clinical setting.
2. Perform basic and advanced sonographic procedures with minimal assistance from preceptors.
3. Perform complex sonographic procedures with guidance from preceptors.
4. Analyze clinical experiences to broaden patient care skills.

DMS 280. Clinical Practicum IV**5 Credits (20P)**

Application of technical and professional aspects of diagnostic ultrasound in a hospital or clinical setting at a proficient level. Ongoing reinforcement and broadening of knowledge base related to hospital procedures and policies. Continued observation, assistance and performance of patient care and sonographic duties under limited supervision. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 290. Small Parts & Superficial Structures**2 Credits (2)**

Includes anatomy, pathology and pathophysiology, protocol development, scanning techniques, recognition of anatomical structures and the normal and pathological ultrasound appearance of the breast, thyroid, neck, scrotum, non-cardiac chest and musculoskeletal ultrasound. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 290 L. Small Parts & Superficial Structures Lab**1 Credit (3P)**

Includes scanning of various small part exams and phantoms, including breast, thyroid, scrotal, non-cardiac chest, and musculoskeletal ultrasound exams. Includes targeted scanning exercises to enhance sonographic skills.

Learning Outcomes

1. Demonstrate proficiency in scanning breast and testicular phantoms.
2. Recognize and document sonographic anatomy of the thyroid and neck structures.
3. Demonstrate understanding of limited musculoskeletal sonographic examinations.
4. Complete targeted scan exercises in a variety of body systems.

DMS 291. Registry Preparation: OB/GYN**1 Credit (1)**

Registry preparation mock examinations over materials covered in Obstetric and Gynecological ultrasound. Students must pass this course with a 74% or better OR pass national certification in OB/GYN Sonography. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 292. Registry Preparation: Abdomen**1 Credit (1)**

Registry preparation mock examinations over materials covered in abdominal ultrasound including small parts and superficial structures. Students must pass this course with a 74% or better OR pass ARDMS national certification exam in Abdominal Sonography. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

DMS 293. Registry Preparation: Vascular**1 Credit (1)**

Registry preparation mock examinations over materials covered in vascular ultrasound. Students must pass this course with a 74% or better OR pass national certification in Vascular Technology. Restricted to: DMS majors. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Identify and describe vascular anatomy.
2. Recognize vascular pathology based on sonographic images.
3. Describe hemodynamic changes associated with vascular pathology.
4. Demonstrate understanding of patient care, exam protocols, and department procedures.

DRFT-DRAFTING

DRFT 100. Introduction to Architecture, Engineering, & Construction**3 Credits (3)**

Introduction to and exploration of careers in the fields of architecture, engineering, and construction. Specific fields to include: architecture, civil engineering, mechanical engineering, structural engineering, engineering technology, residential construction, commercial construction, geographical information systems (GIS), surveying, sustainable design, and green building. Crosslisted with: ARCH 1310. Restricted to Community Colleges campuses

Learning Outcomes

1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 100 Course Competencies
5. Describe different career options in architecture, engineering, and construction,
6. Define the roles of different design professionals and support staff,
7. Explain related educational and professional licensing requirements,
8. Articulate employer expectations,
9. Explore related courses and programs of study at DACC and NMSU, and
10. Develop good workplace skills and professional, productive work habits.

DRFT 101. Introduction to Drafting and Design Technologies**1 Credit (1)**

Professional and student organizations associated with the Drafting and Design Technologies program, degree requirements, employment skills and work habits, and university and college policies and procedures will be explored. Students will be introduced to the current learning management system and career-readiness certification. Restricted to Community Colleges only.

DRFT 105. Technical Drawing for Industry**3 Credits (2+2P)**

Technical sketching, basic CAD, and interpretation of drawings with visualization, speed and accuracy highly emphasized. Areas of focus include various trades such as machine parts, welding, heating and cooling, and general building sketches/plan interpretation.

DRFT 108. Drafting Concepts/Descriptive Geometry**2 Credits (1+2P)**

Basic manual drafting skills, sketching, terminology and visualization. Graphical solutions utilizing applied concepts of space, planar, linear and point analyses. Metric and S.I. units introduced.

DRFT 109. Computer Drafting Fundamentals**3 Credits (2+2P)**

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: E T 109 and C E 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

DRFT 112. Drafting Concepts/Computer Drafting Fundamentals I**4 Credits (2+4P)**

Basic drafting skills, terminology, and visualization. Introduction to principles and fundamentals of computer-aided drafting. Same as E T 106.

Prerequisites: OECS 207, OECS 125 or consent of instructor.

DRFT 113. Drafting Concepts/Computer Drafting Fundamentals II**4 Credits (2+4P)**

Drafting for mechanical/industrial applications; machine part detailing, assemblies in orthographic, isometric, auxiliary, oblique, and sectional views. Two-dimensional AutoCAD with introduction to 3-D AutoCAD. Same as E T 216. Restricted to: Community Colleges only.

Prerequisite: DRFT 112.

DRFT 114. Introduction to Solid Modeling**3 Credits (2+2P)**

Introduction to 3D mechanical parametric solid modeling and basic assembly creation utilizing Autodesk Inventor as well as other applicable solid modeling software packages. Creation of 2D working drawings from 3D solid models and 3D models for machining/manufacturing purposes will be emphasized. Application of Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standard fastening and manufacturing practices methods will be introduced. Restricted to Community Colleges campuses only.

Prerequisite: DRFT 109.

Learning Outcomes

1. Create 3D solid models.
2. Read and interpret 2D technical drawings.
3. Read and interpret 3D technical drawings.
4. Define and sketch the standard, sectional, and auxiliary views of a given object.
5. Annotate working mechanical drawings following industry standards.
6. Dimension working mechanical drawings following industry standards.
7. Identify standard threads callouts.
8. Identify standard fasteners callouts.
9. Identify standard metal shapes and sizes. 1
10. Produce sheet and assembly drawings. 1
11. Manage Electronic files.

DRFT 115. General Construction Safety**3 Credits (3)**

Overview of general construction safety related to building, highway and road construction, and surveying field work for entry-level individuals. Students will also have the opportunity to earn a 10-hour construction industry OSHA card. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

DRFT 124. Introduction to Geometric Dimensioning and Tolerancing**3 Credits (2+2P)**

Introduction to geometric dimensioning and tolerancing (GD&T) for the mechanical CAD drafting, solid modeling, mechanical engineering technology, mechanical engineering, and manufacturing industries. Related industry standard finishes and fasteners will also be introduced and explored.

Prerequisite(s)/Corequisite(s): DRFT 114. Restricted to Community Colleges campuses only.

DRFT 130. General Building Codes**3 Credits (2+2P)**

Interpretation of the Building Code, local zoning codes, A.D.A. Standards and the Model Energy Code to study construction and design requirements and perform basic plan checking. Restricted to: Community Colleges only.

DRFT 135. Electronics Drafting I**3 Credits (2+2P)**

Drafting as it relates to device symbols; wiring, cabling, harness diagrams and assembly drawings; integrated circuits and printed circuit boards; schematic, flow and logic diagrams; industrial controls and electric power fields. Drawings produced using various CAD software packages.

Prerequisites: DRFT 108 and DRFT 109.

DRFT 143. Civil Drafting Fundamentals**3 Credits (2+2P)**

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Crosslisted with: E T 143. Restricted to Community Colleges only.

Prerequisite(s): DRFT 109.

DRFT 151. Construction Principles and Print Reading**3 Credits (2+2P)**

Introduction to construction materials, methods, and basic cost estimating and print reading applicable in today's residential, commercial, and public works industry. Instruction by print reading and interpretation, field trips, and actual job-site visits and progress evaluation.

DRFT 153. Survey Drafting Applications**3 Credits (2+2P)**

Introduction to drafting in the field of survey engineering. Drawings, projects and terminologies related to Point Data, topography, land/boundary surveys, legal descriptions and plat surveys. Using the current Autodesk software. Crosslisted with: SUR 143. Restricted to: Community Colleges only.

Prerequisite(s): DRFT 109.

DRFT 160. Construction Take-Offs and Estimating**3 Credits (2+2P)**

Computing and compiling materials and labor estimates from working drawings using various techniques common in general building construction and in accordance with standard specifications and estimating formats. Use of spreadsheets and estimating software introduced.

Prerequisite: DRFT 151.

DRFT 163. Civil Infrastructure Detailing**3 Credits (2+2P)**

Infrastructure detailing related to civil engineering projects including: ponding, roadway, sewer, and storm-water structures; concrete foundations; and related utility details. Restricted to Community Colleges campuses

Prerequisite(s): DRFT 109.

Learning Outcomes

1. I. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 163 Course Competencies I. Create applicable details utilizing AutoCAD and other software packages,
5. Interpret local design standards, applicable codes, and industry practices,
6. Apply local design standards,
7. Apply applicable codes,
8. Follow standards industry practices,
9. Design applicable details within given parameters, and
10. Develop good workplace skills and professional, productive work habits.

DRFT 164. Intermediate Mechanical Drafting/Solid Modeling**3 Credits (2+2P)**

Intermediate 3D mechanical parametric solid modeling and assembly creation utilizing Solidworks as well as other applicable parametric modeling software packages. Creation of 2D working drawings from 3D solid models, 3D models for machining/manufacturing, and assemblies will be emphasized. Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standard fastening and manufacturing practices and methods will be further explored. Restricted to Community Colleges campuses only.

Prerequisite/Corequisite: DRFT 114.

Learning Outcomes

1. Recognize standard views of a given object.
2. Recognize auxiliary views of a given object.
3. Dimension working mechanical drawings following appropriate industry standards.
4. Produce sectional views of a given object.
5. Apply Geometric Dimensioning and Tolerancing (GDT) practices and standards to working drawings.
6. Identify standard thread and fastener callouts.
7. Apply standard thread and fastener specifications.
8. Create 3D solid models.
9. Produce sheet and assembly drawings. 1
10. Manage Electronic files.

DRFT 165. Introduction to Building Information Modeling**3 Credits (2+2P)**

Introduction to Building Information Modeling (BIM) in the development of virtual 3D building models, construction documents, renderings and basic animations related to architectural, structural, and mechanical/electrical/plumbing building components. Utilizes the latest BIM technologies in the integration one, parametric BIM. Restricted to Community Colleges campuses only.

DRFT 180. Residential Drafting**3 Credits (2+2P)**

Basic residential drafting including, floor plans, foundation plans, sections, roof plans, exterior and interior elevations, and site plans. Applicable residential building and zoning codes, construction methods and materials, adaptable residential design, and drawing and sheet layout for architectural drafting will be introduced. Restricted to Community Colleges campuses only.

Prerequisite(s): DRFT 109.

DRFT 181. Commercial Drafting**3 Credits (2+2P)**

Drafting principles, plan coordination, and code analysis applicable in the development of working drawings for commercial, public, and industrial building projects. Students will utilize National Cad Standards, ADA Standards, and will be introduced to modern office practice. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Prerequisite(s): DRFT 109.

DRFT 190. Finding and Maintaining Employment**2 Credits (2)**

Techniques in self-evaluations, resume writing, application completion, job interviewing, and job retention. Exposure to work ethics, employee attitudes, and employer expectations.

DRFT 204. Geographic Information Systems Technology**3 Credits (2+2P)**

The use of digital information for which various digitized data creation methods are captured. Users will capture, store, analyze and manage spatially referenced data in a modeled mapping procedure. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

DRFT 214. Advanced Solid Modeling**3 Credits (2+2P)**

Advanced 3D mechanical parametric solid modeling and assembly creation utilizing Inventor, Solidworks, and/or other applicable solid modeling and parametric modeling software packages. Creation of complete working drawing sets and/or sheet sets, PDF documents, and assembly drawings will be emphasized. Developing and designing parts and assemblies to meet client needs will be introduced and explored. Restricted to Community Colleges campuses only.

Prerequisite/Corequisite: DRFT 114.

Learning Outcomes

1. Recognize standard views of a given object.
2. Recognize auxiliary views of a given object.
3. Evaluate shop drawings and hand drawings.
4. Create PDFs and Three-Dimensional PDFs from Three-Dimensional models and assemblies.
5. Dimension working mechanical drawings following appropriate industry standards.
6. Produce sectional views of a given object.
7. Apply Geometric Dimensioning and Tolerancing (GDT) practices and standards to working drawings.
8. Identify standard thread and fastener callouts.
9. Apply standard thread and fastener specifications.
10. Produce assembly drawings.
11. Produce working drawing sets and/or sheet sets.
12. Interpret client needs/instructions.

DRFT 222. Introduction to Geomatics**3 Credits (2+3P)**

Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping.

Crosslisted with: SUR 222.

Prerequisite: MATH 1250G or MATH 1430G.

Learning Outcomes

1. Various

DRFT 230. Building Systems Drafting**3 Credits (2+2P)**

Development of working drawings for electrical, plumbing, and HVAC systems, for residential and commercial building through the applications of both 2D Drafting and 3D Building Information Modeling (BIM) techniques. Basics of project setup, National CAD Standards, ADA Standards, modern office practice, code analysis, as well as Sustainability and LEED for new construction. Restricted to: Community Colleges only.

Prerequisite(s): DRFT 180 or DRFT 181.

DRFT 240. Structural Systems Drafting**3 Credits (2+2P)**

Study of foundations, wall systems, floor systems and roof systems in residential, commercial and industrial design/construction. Produce structural drawings including foundation plans, wall and building sections, floor and roof framing plans, shop drawings and details; schedules, materials lists and specifications. Use of various software. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): DRFT 180 or DRFT 181. Restricted to Community Colleges campuses only.

DRFT 242. Roadway Development Drafting**3 Credits (2+2P)**

Advanced civil/survey technology and drafting related to roadway development. Emphasis is on relevant terminology, codes/standards, and the production of complex working drawings such as topographical/grading, drainage, master utilities, roadway P P/details/etc., according to agency standards. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): DRFT 143.

DRFT 243. Land Development Drafting**3 Credits (2+2P)**

Advanced civil/survey technology and drafting related to land development. Emphasis is on relevant terminology codes/standards, and the production of complex working drawings such as subdivision plats, local utility and drainage plans, construction details roadway P P, etc., according to local development/ agency standards.

Prerequisite: DRFT 143 and DRFT 153.

DRFT 250. Principles of Detailing and Design**3 Credits (2+2P)**

Advanced practice in construction documentation in the development and coordination of working drawings & specifications. In particular, will utilize Architectural Graphic Standards, National CAD Standards, and ADA standards to develop detail drawings related to Architectural, Civil, Structural and Building Mechanical systems. Will also be introduced to basic principles, factors, and process of building design such as space planning, site analysis, and basic architectural programming. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): DRFT 180 or DRFT 181. Restricted to Community Colleges campuses only.

DRFT 254. Spatial Data Processing**3 Credits (2+2P)**

Utilizes the tools and technologies of GIS, processing volumes of geodata identifying a numerical, coded or listed map. Involves the analysis of spatial data from various diverse applications and place in a descriptive mapping process. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): DRFT 204.

DRFT 255. Independent Study**1-3 Credits (1-3)**

Instructor-approved projects in drafting or related topics specific to the student's individual areas of interest and relevant to the drafting and graphics technology curriculum. Consent of instructor required. May be repeated for a maximum of 6 credits.

DRFT 258. Introduction to Infracworks**3 Credits (2+2P)**

Introduction to the utilization of Infracworks software for the conceptualization, optimization, and visualization of infrastructure projects in the context of the built and natural environment. Restricted to Community Colleges campuses

Prerequisite(s): DRFT 143.

Learning Outcomes

1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 253 Course Competencies I. Navigate within a 3D drawing/modeling space,
5. Connect drawings to data sources,
6. Stylize data sources,
7. Create models elements,
8. Analyze models,
9. Collaborate on a project with others,
10. Communicate design, and
11. Develop good workplace skills and professional, productive work habits.

DRFT 265. Advanced Building Information Modeling Applications**3 Credits (2+2P)**

Advanced applications of Building Information Modeling (BIM) including the creation of, and practice in collaborative work sets, data and design analyses, energy modeling and analysis, preliminary LEED analysis, construction take-offs & estimation, and construction animation, through use of various BIM and related software. Restricted to: Community Colleges only.

Prerequisite(s): DRFT 165.

DRFT 274. GIS Theory and Analysis**3 Credits (2+2P)**

Analyzes the hypothesis in which location and spatial data sufficiently quantifies the appropriate statistical methodology. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): DRFT 254.

DRFT 276. Computer Rendering and Animation I**3 Credits (2+2P)**

Introduction to technical applications of computer generated renderings and animations for the architecture and engineering fields. 3D models, photo-realistic renderings, and basic animation movie files will be produced utilizing industry standard modeling and animation software.

DRFT 288. Portfolio Development**3 Credits (2+2P)**

Production of a portfolio consisting of previously produced student work related to the student's individualized degree option. Process shall include the compilation and organization of working and presentation drawings, construction documents, BIM Models, and renderings/animations. Students will learn the basics of design layout and online portfolio documentation. Job search and resume preparation activities will also be required. Production of new material and content may also be required. This course is designed as a last semester course in the Drafting & Design curricula. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): Consent of Instructor.

DRFT 290. Special Topics**1-4 Credits (1-4)**

Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

DRFT 291. Cooperative Experience**1-6 Credits (1-6)**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student meets with advisor weekly. Graded S/U.

Prerequisite: consent of instructor.

DRFT 295. Professional Development and Leadership DAGA**1 Credit (1)**

Students gain experience in leadership, team building, performing community service, and membership and/or leadership in a student organization. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

E E-ELECTRICAL ENGINEERING

E E 200. Linear Algebra, Probability and Statistics Applications**4 Credits (3+3P)**

The theory of linear algebra (vectors and matrices) and probability (random variables and random processes) with application to electrical engineering. Computer programming to solve problems in linear algebra and probability.

Prerequisite: C- or better in ENGR 140 and (MATH 1521G or MATH 1521H or ENGR 190).

Learning Outcomes

1. Perform vector and matrix operations, including matrix inversion, eigen analysis, finding basis and dimension of vector spaces and rank of a matrix, and solving a set of linear equations.
2. Calculate probabilities using probability mass, density, and cumulative distribution functions for single and multiple, discrete and continuous random variables, and relate them to electrical engineering applications.
3. Perform simple parameter estimation, such as finding sample mean and variance, and relate to confidence intervals.
4. Describe random processes in the context of signal processing and communications systems problems.
5. Use MATLAB to solve problems involving linear algebra and probability, including designing and performing simple numerical experiments.

E E 240. Multivariate and Vector Calculus Applications**3 Credits (3)**

Vector algebra, cylindrical and spherical coordinates, partial derivatives, multiple integrals. Calculus of vector functions through electrostatic applications. Divergence, gradient, curl, divergence theorem, Stokes's theorem, Coulomb's Law, Gauss's Law, electric field, electric potential. Applications in Matlab.

Prerequisite: C- or better in (MATH 1521G or MATH 1521H or ENGR 190) and ENGR 140.

Learning Outcomes

1. Students will demonstrate conceptual understanding of the fundamental principles and theories in vector calculus
2. Students will analyze and solve problems using vector calculus in three coordinate systems

E E 300. Cornerstone Design**2 Credits (1+3P)**

Application and realization of engineering principles to a guided team-based design project. Formulation and implementation of test procedures, evaluation of alternate solutions and oral and written communication of the design and test results. Restricted to: E E majors. Restricted to Las Cruces campus only.

Prerequisite: C- or better in ENGR 140 and ENGR 230 and E E 200.

Learning Outcomes

1. Formulate and implement test procedures for validation of requirements.
2. Evaluate alternative design solutions.
3. Document test procedures and design solutions.
4. Implement design to include a printed-circuit board, electronics and coding.
5. Communicate the design and validation both orally and in writing to a wide range of target audiences.
6. Work in teams.

E E 317. Semiconductor Devices and Electronics I**4 Credits (3+3P)**

Analysis and design of opamp circuits, diode circuits and single-transistor MOS and BJT amplifiers. Introduction to solid-state semiconductor devices.

Prerequisite: C- or better in ENGR 230 and CHEM 1215G.

Learning Outcomes

1. Analysis and design of single time-constant circuits, op-amp circuits, and linear power supplies.
2. Understanding of solid-state devices.
3. Biasing and small-signal analysis of MOS and BJT single transistor amplifiers.
4. Using computer tools to simulate electronic circuits.
5. Testing electronic circuits using power supplies, function generators, digital multi-meters, and oscilloscopes.
6. Writing and documenting laboratory results.

E E 320. Signals and Systems I**3 Credits (3)**

Introduction to the modeling and analysis of continuous- and discrete-time signals and systems using time- and frequency-domain methods suitable for both mathematical approaches and computer-aided simulations.

Prerequisite: C- or better in ENGR 190.

Learning Outcomes

1. Understand different types of signals (continuous-time, discrete-time, periodic, etc.) and how these signals are represented mathematically and in a computer.
2. Understand systems representations (e.g., impulse responses), implementations (e.g., convolution and difference/differential equations), and properties (e.g., linearity).
3. Gain insight into transform-domain analysis for signals and systems.
4. Develop the ability to apply transform domain and LTI analysis to simple applications in signal processing, communications, and controls using Matlab.

E E 325. Signals and Systems II**4 Credits (3+3P)**

Introduction to communication systems including amplitude and frequency modulation. Introduction to control systems including linear feedback systems, root-locus analysis, and graphical representations. Introduction to digital signal processing including sampling, digital filtering, and spectral analysis.

Prerequisite: C- or better in E E 200 and E E 320.

Learning Outcomes

1. To model, analyze, simulate, and perform calculations with continuous- and discrete-time systems.
2. To develop an understanding of basic modulations in communication systems.
3. To gain insight into the basics of control systems.
4. To develop insight into filtering and analysis of digital signals.
5. To learn how to use MATLAB and SIMULINK to perform analysis, design, and simulation of communication, control, and signal processing systems.

E E 333. AC Circuit Analysis and Introduction to Power Systems**3 Credits (2+3P)**

Steady-state analysis of AC circuits, three-phase circuits, and an introduction to power systems.

Prerequisite: C- or better in ENGR 230.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession which will establish background for further studies in power systems.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 340. Fields and Waves**4 Credits (3+3P)**

Static electromagnetic field. Maxwell's equation and time-varying electromagnetic fields. Generalized plane wave propagation, reflection, transmission, superposition and polarization. Transmission line theory. Extensions to optical wave propagation. Applications including Time Domain Reflectometry (TDR) and fiber optic transmission. Laboratory experience with RF/microwave test equipment and optical apparatus.

Prerequisite: C- or better in ENGR 230 and E E 240.

Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations (such as Maxwell's) governing transmission lines, static and time-varying fields, propagation, reflection and transmission of plane waves, waveguides, and antennas.
2. Students will analyze and solve electromagnetic-related problems by applying fundamental principles, theories, and equations (such as Maxwell's equations).
3. Students will demonstrate effective team work.
4. Students will demonstrate the use of RF/microwave test equipment to perform basic RF circuit measurements.

E E 362. Introduction to Computer Organization**4 Credits (3+3P)**

Concepts of modern computer organization, CPU control, pipelining, memory hierarchies, memory mapping, hardware-software interface, and operating systems.

Prerequisite: C- or better in ENGR 120 and MATH 1250G.

Prerequisite/Corequisite: ENGR 140.

Learning Outcomes

1. Be conversant with fundamental concepts of computer organization.
2. Compare and contrast organizational features of different computer.
3. Understand the use of microprocessors and peripheral devices in practical applications

E E 395. Introduction to Digital Signal Processing**3 Credits (3)**

Undergraduate treatment of sampling/reconstruction, quantization, discrete-time systems, digital filtering, z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications. Laboratory will emphasize practical implementation of signal processing including real-time signal processing.

Prerequisite(s): C- or better in E E 325.

E E 400. Undergraduate Research**1-3 Credits**

Directed undergraduate research. May be repeated for a maximum of 9 credits.

Prerequisite: consent of the department head.

E E 403. Geometric Algebra**3 Credits (3)**

Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Taught with E E 576.

Prerequisite: C- or better in E E 320.

Learning Outcomes

1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 405. Electricity Markets**3 Credits (3)**

Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Taught with E E 502.

Prerequisite: C- or better in E E 431.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 406. Quantum Computing**3 Credits (3)**

This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught concurrently with E E 506.

Learning Outcomes

1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 407. Introduction to Control Systems**3 Credits (3)**

This course provides an introduction to the analysis of control systems. The main focus will be on techniques in classical control theory. System dynamics and modeling techniques in both the frequency domain and the time domain will be covered. Students will learn how to transform linear dynamical systems between state-space and frequency domains, and evaluate conditions for stability in each domain. Students will analyze and characterize both the transient and steady-state response, and examine root locus, Bode, and Nyquist plots. Concepts of robust control, including tradeoffs between sensitivity and performance, will be emphasized throughout. Applications will range across electrical, mechanical, chemical, biomedical, and biological systems. Laboratory activities include modeling, analysis and simulation of physical processes.

Prerequisite: C- or better in E E 325 and MATH 392.

Learning Outcomes

1. Obtain mathematical models of electrical and mechanical systems from their idealized elements.
2. Derive the transfer function of a control system.
3. Apply their mathematical knowledge to determine the response of a linear system to various types of inputs.
4. Develop familiarity and confidence with analyzing transient and steady state responses of a linear system.
5. Apply their mathematical knowledge to understand the concept of stability.
6. Develop familiarity and confidence with controller design based on Routh-Hurwitz, Root locus and P, PI, PID modes of control.
7. Develop proficiency in systems simulation using MATLAB and SIMULINK.

E E 409. Hardware & Software Codesign**3 Credits (3)**

This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Taught with E E 556.

Prerequisite: C- or better in ENGR 140 and ENGR 130 and (E E 362 or C S 473).

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.
2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Describe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture

E E 412. ASIC Design**3 Credits (3)**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Taught with E E 512.

Prerequisite: C - or better in E E 480.

Learning Outcomes

1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 431. Power Systems II**3 Credits (3)**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Taught with E E 542.

Prerequisite: C- or better in E E 333.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 432. Power Electronics**3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Taught with E E 537.

Prerequisite: C- or better in E E 317 and E E 333.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 433. Power System Operation**3 Credits (3)**

Basics of power system operation; linear programming, economic dispatch, mixed integer programming, power system security and contingency analysis; RTO operation; generation control; renewable integration.

Prerequisite: C- or better in E E 431.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium.
2. Understand basics of linear programming and can use software to solve simple linear programming problems.
3. Understand the difference between AC and DC power flow. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment.
4. Understand the control schemes in power system, including governor response, automatic generation control.
5. Understand the power system security including N-1 criteria, contingency analysis, and security constraints.

E E 440. Photovoltaic Devices and Systems**3 Credits (3)**

Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Taught with E E 540.

Prerequisite: C- or better in E E 317.

Learning Outcomes

1. Name at least three different types of photovoltaic materials and cells;
2. Derive equations governing operation of photovoltaic cells;
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity;
4. Describe principles of operation of the "balance of the system" (BOS) components of the photovoltaic system.

E E 443. Mobile Application Development**3 Credits (3)**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. Taught with E E 593.

Prerequisite: C- or better in C S 151 or C S 152 or C S 172 or C S 271 or C S 451 or C S 452.

Learning Outcomes

1. The objective of this course is to gain an understanding of mobile application development, including Swift, Model-View-Controller (MVC) pattern, Memory management, View controllers, Frameworks: Foundation, CoreGraphics, CoreLocation, MapKit, UIKit, WebKit

E E 444. Advanced Image Processing**3 Credits (3)**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with E E 588.

Prerequisite: C- or better in E E 446.

Learning Outcomes

1. Implement and analyze segmentation of color and grayscale images.
2. Implement and analyze morphological analysis of binary images
3. Implement and analyze compression of images
4. Implement and analyze feature extraction and classification of images
5. Implement and analyze convolutional neural networks (CNNs) for classification of images

E E 446. Digital Image Processing**3 Credits (3)**

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Taught with E E 596.

Prerequisite: C- or better in E E 325.

Learning Outcomes

1. Analyze human visual perception and the implications to science and society
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing
4. Formulate and analyze problems related to color image acquisition, processing, and display
5. Implementing image processing algorithms on computers in Matlab or python

E E 447. Neural Signal Processing**3 Credits (3)**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Taught with E E 597.

Prerequisite: C- or better in E E 325.

Learning Outcomes

1. Demonstrate understanding and skill in the Structure and basic operation of the human brain
2. Demonstrate understanding and skill in processing of EEG brain signals using Matlab and EEGLAB
3. Demonstrate understanding and skill in EEG-related neural modeling
4. Demonstrate understanding and skill in brain signal types and acquisition

E E 448. Signal Compression**3 Credits (3)**

Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Taught with E E 573.

Prerequisite: C- or better in E E 200.

Learning Outcomes

1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/sampling

E E 449. Smart Antennas**3 Credits (3)**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 549.

Prerequisite: C- or better in E E 325 and E E 340.

Learning Outcomes

1. Antenna and Array fundamentals
2. Smart Antenna and Adaptive Array concepts: Uniform and Planar Arrays; Array steering; Array performance criteria; Error effects on beamforming
3. Adaptive Beamforming Algorithms and Architectures: gradient-based algorithms, Sample Matrix Inversion; Least Mean Square; Recursive Least Mean Square; Sidelobes cancellers; Direction of Arrival estimations; Effects of mutual coupling and its mitigation.
4. Applications: Angle of arrival estimation; Diversity combining; Nulling for jammer suppression and clutter cancellation, etc.

E E 452. Introduction to Radar**3 Credits (3)**

Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Recommended foundation: E E 496. Taught with E E 548.

Prerequisite: C- or better in E E 325 and E E 340.

Learning Outcomes

1. Students will demonstrate an understanding of fundamental principles of various types of radar systems and their applications,
2. Students will learn to analyze a given radar system,
3. Students will learn to use simulation techniques to design a radar system that will yield desired characteristics,
4. Students will experience working in groups/teams

E E 453. Microwave Engineering**3 Credits (3)**

Techniques for microwave measurements and communication system design, including transmissions lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521.

Prerequisite: C- or better in E E 340.

Learning Outcomes

1. Students will demonstrate an understanding of fundamental principles and theories related to microwave systems, components, and devices
2. Students will analyze and solve microwave engineering-related problems using the fundamental microwave engineering theories and principles
3. Students will demonstrate the use of microwave engineering design tools
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 454. Antennas and Radiation**4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Taught with E E 541.

Prerequisite: C- or better in E E 340.

Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 458. Hardware Security and Trust**3 Credits (3)**

This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Taught with E E 558.

Prerequisite: C- or better in E E 362.

Learning Outcomes

1. Understand the security goals of information security
2. Understand cryptography basics and their applications
3. Formulate and analyze problems related to security threats in integrated circuits, electronic devices and semiconductor supply chain
4. Formulate and analyze problems related to security countermeasures to the threats of integrated circuits and electronic devices
5. Use metrics to measure and assess the security level of security mechanisms or primitives in hardware security applications
6. Analyze and assess potential security vulnerabilities in hardware and embedded systems
7. Learn state-of-art security mechanisms and research topics in the hardware and embedded security area

E E 460. Space System Mission Design and Analysis**3 Credits (3)**

Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems. Students must be in junior standing to enroll.

Learning Outcomes

1. Apply knowledge from science, math and engineering to satellite design.
2. Experience the "system engineering" of satellite design through the design of a space mission.
3. Understand the professional and ethical responsibilities related to satellite design.
4. Understand the impact of satellite related engineering solutions in a global, economic, environmental, and societal context.
5. Maintain a knowledge of contemporary professional, societal and global issues as they relate to satellites.

E E 462. Computer Systems Architecture**3 Credits (3)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Taught with E E 562.

Prerequisite: C- or better in E E 362.

Learning Outcomes

1. Recognize the basic principles and current practices of computer architectures of processors, memory systems, interconnects, and input/output systems
2. Reason about the issues that influence the architectures of processors, memory systems, interconnects, and input/output systems
3. Evaluate and improve computer system performance through analysis and computer simulation
4. Solve and implement a small research problem in computer architecture.

E E 465. Machine Learning I**3 Credits (3)**

An undergraduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Taught with E E 565.

Prerequisite: C- or better in E E 200.

Learning Outcomes

1. Formulate and solve problems related to the basic concepts and mathematical techniques of machine learning.
2. Gain an understanding of machine learning algorithms/methods by solving problems using software.
3. Gain experience doing independent study and research.
4. Formulate and solve problems related to the basics of regression, classification, and unsupervised learning.
5. Gain practical experience through project-based assignments and technical report writing.

E E 467. ARM SOC Design**3 Credits (3)**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Taught with E E 567.

Prerequisite: C- or better in E E 362 and E E 317.

Learning Outcomes

1. Formulate and solve problems requiring knowledge and understanding of ARM processor architectures and ARM-based SoCs
2. Capture the design of ARM-based SoCs in a standard hardware description language
3. Conduct low-level software design for ARM-based SoCs and high-level application development
4. Demonstrate the ability to use and choose between different techniques for digital system design and capture;
5. Evaluate implementation results (e.g. speed, area, power) and correlate them with the corresponding high level design and capture;
6. Demonstrate the ability to use a commercial tools to develop ARM-based SoCs

E E 473. Introduction to Optics**3 Credits (3)**

The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Crosslisted with: PHYS 473.

Prerequisite(s): C- or better in PHYS 1320G or PHYS 2120.

E E 475. Control Systems Synthesis**3 Credits (3)**

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Taught with E E 551.

Prerequisite: C- or better in E E 407.

Learning Outcomes

1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of a auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain)
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity)
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation)
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations)

E E 476. Computer Control Systems**3 Credits (3)**

Representation, analysis and design of discrete-time systems using time-domain and z-domain techniques. Microprocessor control systems.

Prerequisite(s): C- or better in E E 325.

E E 478. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 528. Recommended foundation: E E 473 /PHYS 473.

Prerequisite: C- or better in PHYS 1320G or PHYS 2120.

Learning Outcomes

1. Understand the fundamentals of the different theories of light including ray, wave, electromagnetic (vector) and photon optics, and how these theories are represented mathematically and on a computer.
2. Develop the ability to perform calculations for the different theories (e.g., ray tracing, wave interference, polarization calculus, photon detection) to determine the propagation characteristics and describe the manipulation of light.
3. Gain insight and experience with materials and devices for manipulating and detecting light (e.g., glass, mirrors, lenses, fiber optics, polarization elements, liquid crystals, semiconductors, and photodiodes).
4. Apply the theoretical, mathematical, and practical understanding of optics to describe real-world applications of light technology with supporting analysis and calculations.

E E 479. Lasers and Applications**4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Taught with E E 529. Crosslisted with: PHYS 479.

Prerequisite(s): C- or better in E E 340 or in PHYS 461.

E E 480. Introduction to Analog and Digital VLSI**3 Credits (3)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Taught with E E 510.

Prerequisite: C- or better in E E 362 and E E 317.

Learning Outcomes

1. Explain the basic concepts of CMOS VLSI system design
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions
3. Use modern software tools to simulate integrated circuits
4. Formulate and solve problems related to operation and design of basic analog building blocks
5. Formulate and solve problems related to operation and design of basic digital building blocks
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area..) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 482. Electronics II**3 Credits (3)**

Feedback analysis, application of operational amplifiers, introduction to data converters, analog filters, and oscillator circuits.

Prerequisite(s): C- or better in E E 317.

E E 485. Analog VLSI Design**3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523.

Prerequisite: C- or better in E E 320 and E E 480.

Learning Outcomes

1. Analysis, design, simulation, and layout of current mirrors, current sources, and voltage references
2. Analysis, design, simulation, and layout of differential and operational amplifiers
3. Analysis, design, simulation, and layout of switched-capacitor circuits
4. Using VLSI CAD tools for simulating and laying out analog integrated circuits
5. Writing laboratory reports and project documentation

E E 490. Selected Topics**1-3 Credits**

May be repeated for a maximum of 9 credits. Graduate students may not use credits of E E 490 toward an M.S. or Ph.D. in electrical engineering.

Prerequisite: consent of instructor.

E E 493. Power Systems III**3 Credits (3)**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543.

Prerequisite: C- or better in E E 431.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 496. Introduction to Communication Systems**3 Credits (3)**

Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems.

Prerequisite(s): C- or better in E E 325.

E E 497. Digital Communication Systems I**3 Credits (3)**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 496. Taught with: E E 581.

Prerequisite: C- or better in E E 200 and E E 325.

Learning Outcomes

1. Analyze bandwidth and error performance of baseband and bandpass signals through mathematical explanations and simulated experimental data.
2. Evaluate channel code structures and their performance.
3. Analyze communication system issues involving link budgets, synchronization and resource allocations.
4. Develop a wider perspective recognizing contemporary technologies, impact of the solutions and professional and ethical responsibilities.

E E 501. Research Topics in Electrical and Computer Engineering**1 Credit (1)**

Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering.

E E 502. Electricity Markets**3 Credits (3)**

Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Recommended foundation: E E 431. Taught with: E E 405.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 506. Quantum Computing**3 Credits (3)**

This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught concurrently with E E 406.

Learning Outcomes

1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 510. Introduction to Analog and Digital VLSI**3 Credits (3)**

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Recommended foundation: E E 362 and E E 317 Taught with E E 480.

Learning Outcomes

1. Explain the basic concepts of CMOS VLSI system design
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions
3. Use modern software tools to simulate integrated circuits
4. Formulate and solve problems related to operation and design of basic analog building blocks
5. Formulate and solve problems related to operation and design of basic digital building blocks
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area..) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 512. ASIC Design**3 Credits (3)**

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Recommended foundation: E E 480. Taught with E E 412.

Learning Outcomes

1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 515. Electromagnetic Theory I**3 Credits (3)**

Electromagnetic theory of time-harmonic fields in rectangular, cylindrical and spherical coordinates with applications to guided waves and radiated waves. Induction and equivalence theorems, perturbational and variational principles applied to engineering problems in electromagnetics. Recommended foundation: E E 340.

E E 516. Electromagnetic Theory II**3 Credits (3)**

Continuation of E E 515.

E E 521. Microwave Engineering**3 Credits (3)**

Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Recommended foundation: E E 340. Taught with: E E 453.

E E 523. Analog VLSI Design**3 Credits (2+3P)**

Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended foundation: E E 320 and E E 480. Crosslisted with: E E 485.

E E 528. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Taught with E E 478. Crosslisted with: PHYS 528.

Prerequisite: (PHYS 1320G or PHYS 2120) and E E 473/PHYS 473.

Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

E E 529. Lasers and Applications**4 Credits (3+3P)**

Laser operating principles, characteristics, construction and applications. Beam propagation in free space and fibers. Laser diode construction and characteristics. Hands-on laboratory. Recommended foundation: E E 351 or PHYS 461. Taught with: E E 479 with differentiated assignments for graduate students. Crosslisted with: PHYS 529

E E 534. Power System Relaying**3 Credits (3)**

Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended foundation: E E 493.

E E 537. Power Electronics**3 Credits (2+3P)**

Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended foundation: E E 317 and E E 333. Taught with: E E 432.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 540. Photovoltaic Devices and Systems**3 Credits (3)**

Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Recommended foundation: E E 317. Taught with: E E 440.

Learning Outcomes

1. Name at least three different types of photovoltaic materials and cells.
2. Derive equations governing operation of photovoltaic cells.
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity.
4. Describe principles of operation of the “balance of the system” (BOS) components of the photovoltaic system.

E E 541. Antennas and Radiation**4 Credits (3+3P)**

Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended foundation is E E 340. Taught with E E 454.

Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 542. Power Systems II**3 Credits (3)**

Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended foundation: E E 333. Taught with E E 431.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/ planning of power systems

E E 543. Power Systems III**3 Credits (3)**

Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended foundation: E E 431. Taught with: E E 493.

Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 544. Distribution Systems**3 Credits (3)**

Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended foundation: E E 542 and E E 543.

E E 545. Digital Signal Processing II**3 Credits (3)**

Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended foundation: E E 395.

E E 548. Introduction to Radar**3 Credits (3)**

Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended foundation: E E 200, E E 340 and E E 496. Taught with: E E 452.

E E 549. Smart Antennas**3 Credits (3)**

Smart antenna and adaptive array concepts and fundamentals, uniform and planar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Recommended foundation: E E 325 and E E 340. Crosslisted with: E E 449.

E E 551. Control Systems Synthesis**3 Credits (3)**

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Recommended foundation: E E 407 Intro to Control Systems or equivalent. Taught with E E 475.

Learning Outcomes

1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of a auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain)
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity)
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation)
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations)

E E 556. Hardware & Software Codesign**3 Credits (3)**

This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Taught with E E 409.

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.
2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Describe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture

E E 558. Hardware Security and Trust**3 Credits (3)**

This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Recommended foundation: E E 212. Crosslisted with: E E 458.

E E 562. Computer Systems Architecture**3 Credits (3)**

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended foundation is E E 212. Taught with: E E 462.

E E 563. Computer Performance Analysis I**3 Credits (3)**

Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 200 and E E 462.

E E 564. Architectural Concepts II**3 Credits (3)**

Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474. Crosslisted with: C S 573.

Learning Outcomes

1. Be able to explain the features in a modern multicore CPU architecture
2. Be able to utilize hardware counter features of a CPU in performance evaluation
3. Be able to explain the architecture of GPUs and their capabilities and drawbacks
4. Be able to evaluate novel cutting-edge architectural features and designs
5. Be able to present a research paper to an advanced audience

E E 565. Machine Learning I**3 Credits (3)**

A graduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Recommended foundation: E E 571 and MATH 480. Taught with: E E 465.

E E 567. ARM SOC Design**3 Credits (3)**

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages.

Recommended foundation is E E 212 and E E 317. Crosslisted with: E E 467.

E E 571. Random Signal Analysis**3 Credits (3)**

Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems.

E E 572. Modern Coding Theory**3 Credits (3)**

Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation: E E 200 and E E 496.

E E 573. Signal Compression**3 Credits (3)**

Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Taught with E E 448.

Learning Outcomes

1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/sampling

E E 576. Geometric Algebra**3 Credits (3)**

Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Taught with E E 403.

Learning Outcomes

1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 577. Fourier Methods in Electro-Optics**3 Credits (3)**

Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 320 and E E 528. Crosslisted with: PHYS 577.

E E 578. Optical System Design**3 Credits (3)**

Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E/PHYS 473, E E/PHYS 528 and E E/PHYS 577. Crosslisted with: PHYS 578.

E E 581. Digital Communication Systems I**3 Credits (3)**

Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 200, E E 325, and E E 496. Crosslisted with: E E 497.

E E 583. Wireless Communication**3 Credits (3)**

Cellular networks, wireless channels and channel models, modulation and demodulation, MIMO, diversity and multiplexing, OFDM, wireless standards including LTE and WiMAX. Recommended foundation: E E 571 and E E 325.

E E 585. Telemetry Systems**3 Credits (3)**

Covers the integration of components into a command and telemetry system. Topics include analog and digital modulation formats, synchronization, link effects, and applicable standards. Recommended foundation: E E 395, E E 496, and E E 497.

E E 586. Information Theory**3 Credits (3)**

This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Restricted to: Main campus only. Crosslisted with: MATH 509

Prerequisite(s): E E 571 or MATH 515.

E E 588. Advanced Image Processing**3 Credits (3)**

Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with: E E 444.

Prerequisite: E E 446 or E E 596.

E E 590. Selected Topics**1-9 Credits**

May be repeated for a maximum of 18 credits.

E E 593. Mobile Application Development**3 Credits (3)**

Introduction to mobile application development. Students will develop applications for iOS devices including iPhone and iPad. Topics include object-oriented programming using Swift, model-view-controller (MVC) pattern, view controllers including tables and navigation, graphical user interface (GUI) design, data persistence, GPS and mapping, camera, and cloud and web services. Recommended foundation: C S 451 or C S 452. Taught with: E E 443.

E E 596. Digital Image Processing**3 Credits (3)**

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Crosslisted with: E E 446.

E E 597. Neural Signal Processing**3 Credits (3)**

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Crosslisted with: E E 447.

E E 598. Master's Technical Report**1-9 Credits (1-9)**

Individual investigation, either analytical or experimental, culminating in a technical report. Graded PR/S/U. May be repeated up to 18 credits. Thesis/Dissertation Grading.

E E 599. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits. Thesis/Dissertation Grading.

E E 600. Doctoral Research**1-15 Credits**

Research.

E E 615. Computational Electromagnetics**3 Credits (3)**

The numerical solution of electromagnetics problems. Topics include differential equation techniques, integral equation methods, hybrid techniques, algorithm development and implementation, and error analysis. Particular algorithms, including FEM, finite differences, direct solvers, and iterative solvers, are studied.

E E 690. Selected Topics**1-9 Credits**

May be repeated for a maximum of 9 credits.

E E 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. May be repeated up to 88 credits. Thesis/Dissertation Grading.

E T-ENGINEERING TECHNOLOGY

E T 101. Introduction to Engineering Technology and Geomatics**1 Credit (1)**

An introduction to geomatics and the various engineering technology disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities.

Learning Outcomes

1. Develop a basic understanding of all programs in the Engineering Technology and Surveying Engineering Department.
2. Create a solid curriculum plan for their degree program.
3. Describe the Engineering Design Process.
4. Define and visit campus support programs and student engineering programs.
5. Describe and discuss communication skills in the engineering profession.

E T 104. Soldering Techniques**1 Credit (3P)**

Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards.

E T 109. Computer Drafting Fundamentals**3 Credits (2+2P)**

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and C E 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units.
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes.
11. Utilize the two Drawing Environments: Paper Space and Model Space.
12. Manage AutoCAD drawing files.

E T 110. Introduction to 3-D Modeling (Solid Works)**3 Credits (2+3P)**

Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies.

E T 120. Computation Software**2-3 Credits (2-3)**

The use of spreadsheet software in the field of engineering technology.

E T 125. Introduction to Renewable Energy**3 Credits (3)**

Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

E T 143. Civil/Survey Drafting I**3 Credits (2+2P)**

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic mapping, contour drawings, plan, and profiles as street/highway layout. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 109 or DRFT 109.

Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil 3D software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting and trigonometry is required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.

E T 153. Fundamentals of Networking Communications**3 Credits (3)**

Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling.

Learning Outcomes

1. Students will identify network types/protocols utilizing the OSI reference model and compute numbering system network problems.
2. Students will explain issues related to managing and documenting network environments.
3. Students will list, compare, and discuss industry standards for addressing computers on a network.
4. Students will list and distinguish between computer networking historical milestones.
5. Students will identify, compare, and evaluate networking data transport techniques.
6. Students will identify and compare network transmission media and build/evaluate network cabling.
7. Students will discuss IT industry certifications and summarize current technology trends.

E T 154. Construction Methods and Communications**3 Credits (3)**

Blueprint reading, specifications, and introduction to materials used in construction. May be repeated up to 3 credits.

Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil Three-Dimensional software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting, and trigonometry as required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.

E T 155. Network Operating Systems I**3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to: Community Colleges only.

Prerequisite(s): E T 120 or E T 122.

E T 156. Introduction to Information Security**2 Credits (2)**

This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.

Prerequisite(s)/Corequisite(s): E T 120. Restricted to Community Colleges campuses only.

E T 160. Windows Fundamentals for IET**3 Credits (3)**

Fundamental review of the Windows operating system including installation and upgrades as well as managing applications, files, folders, devices and maintenance.

Learning Outcomes

1. Properly deploy the Windows OS.
2. Manage Windows OS data and devices.
3. Apply network and connection configurations.
4. Provide Windows OS maintenance.

E T 182. Introduction to Digital Logic**2 Credits (1.5+1.5P)**

An introduction to logic design and the basic building blocks of digital systems. Topics include numbering systems, Boolean algebra, digital logic theory, combinational logic, and applications such as adders. Includes hands-on laboratory

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Demonstrate ability to convert numerical values to commonly-used digital representations and their use for arithmetic and logical functions.
2. Demonstrate understanding of Boolean logic functions and truth tables.
3. Demonstrate ability to simplify logic expressions.
4. Demonstrate understanding of combinational logic functions, and the ability to build digital circuits using breadboards.

E T 183. Applied DC Circuits**3 Credits (2+2P)**

Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab.

Prerequisite(s)/Corequisite(s): MATH 1220G.

E T 183 L. Applied DC Circuits Lab**1 Credit (2P)**

DC applied circuits lab.

Corequisite(s): E T 183.

E T 184. Applied AC Circuits**2-3 Credits (1-2+2P)**

Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab.

Prerequisite: A grade of C- or better in ENGR 120.

Learning Outcomes

1. Analyze and design AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving AC circuits.

E T 190. Applied Circuits**4 Credits (3+2P)**

Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab. May be repeated up to 4 credits.

Prerequisite/Corequisite: MATH 1250G or higher.

Learning Outcomes

1. Analyze and design DC and AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving DC and AC circuits.

E T 191. Applied Circuits Laboratory**1 Credit (2P)**

Applied Circuits Lab

E T 200. Special Topics**1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

E T 210. Intermediate 3-D Modeling (Solid Works)**3 Credits (3)**

Intermediate 3-D modeling. Applied modeling of techniques to prepare for SolidWorks certification (CSWA).

Prerequisite: A grade of C- or better in ENGR 110.

Learning Outcomes

1. Properly operate a CAD system in the most efficient manner.
2. Generate and easily update Part models.
3. Ability to create complex assembly models.
4. Create usable production drawings from Three-Dimensional CAD models.
5. Understand the basic fundamentals of available add-in software compatible with SolidWorks (FEA, CAM, PDM).
6. Work in a group and operate effectively on a team.
7. Use creative and technical thinking skills in design.

E T 217. Manufacturing Processes**3 Credits (3)**

Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: I E 217.

Prerequisite: E T 110 and MATH 1220G.

Learning Outcomes

1. Various

E T 217 L. Manufacturing Processes Lab**1 Credit (3P)**

Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining.

Corequisite: E T 217.

Learning Outcomes

1. Various

E T 220. Internship**1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): E T 283.

E T 240. Applied Statics**3 Credits (3)**

Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams.

Prerequisite(s)/Corequisite(s): MATH 1430G or MATH 1511G.

Prerequisite(s): PHYS 1230G or PHYS 1310G.

E T 241. Applied Dynamics**3 Credits (3)**

The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum.

Prerequisite: A grade of C- or better in either E T 240 or ENGR 233.

Prerequisite/Corequisite: (MATH 1440 or MATH 1521G or MATH 1521H).

Learning Outcomes

1. Various

E T 246. Electronic Devices I**4 Credits (3+3P)**

Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers.

Prerequisite: A grade of C- or better in one of the following: E T 190 or E T 183.

Prerequisite/Corequisite: E T 184 or ENGR 230.

Learning Outcomes

1. Describe semiconductor devices and their properties.
2. Apply the characteristics of diodes to analyze diode rectifier and regulator circuits.
3. Apply the characteristics of bipolar junction transistors (BJTs) to analyze BJT amplifier circuits.
4. Apply the characteristics of metal-oxide-semiconductor field-effect transistors (MOSFETs) to analyze MOSFET amplifier circuits.
5. Describe and analyze complementary MOS (CMOS) digital circuits.
6. Learn to solder and layout printed-circuit boards (PCBs).
7. Design, simulate, and test diode and transistor-amplifier circuits.

E T 253. Networking Operating Systems II**3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

Prerequisite: E T 120 and E T 153.

Learning Outcomes

1. Identify Linux utilities and terminology.
2. Use the Linux filesystem.
3. Install, administer, and manage a Linux system.
4. Utilize Linux user/group management.
5. Install software packages.
6. Apply data management skills.

E T 254. Concrete Technology**3 Credits (2+2P)**

Fundamentals of aggregates, Portland cement, and asphalt used in design and construction. May be repeated up to 3 credits.

Learning Outcomes

1. Define the fundamentals of aggregates and their use in construction including concrete and asphalt.
2. Define the types of concrete and their uses.
3. Prepare and test concrete mix designs.
4. Executing tests for AASHTO Certification.

E T 255. Linux System Administration**3 Credits (3)**

Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.

Learning Outcomes

1. Describe the key features of the Linux operating system.
2. Plan the Linux Filesystem to match system requirements.
3. Design BASH scripts to optimize common Linux operations.
4. Interpret Linux performance data to solve hardware and software issues.
5. Students will demonstrate the Core Linux System Administration.
6. Students will be able to link the use of shell commands to managing Linux server daemons and software.
7. Students will apply these concepts to build application servers running Linux, Apache, MySQL, and PHP (LAMP); Tomcat, CUPS print servers; and create backup solutions.
8. Students will apply problem analysis, object-oriented structured logic, and development concepts.
9. Students will demonstrate an understanding of theory and hands-on experience administrating a Linux Based server.

E T 256. Networking Operating Systems III**3 Credits (3+1P)**

Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.

Prerequisite(s): E T 253.

E T 262. Software Technology I**3 Credits (2+2P)**

An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society.

Prerequisite/Corequisite: (E T 182 or ENGR 130) or (MATH 1250G or MATH 1430G).

Learning Outcomes

1. Set up and use a rich programming environment for programming with C
2. Analyze existing code
3. Employ effective use of basic programming and basic troubleshooting
4. Write, debug and test code given software requirements
5. Apply testing and documentation best practices
6. Transfer programming knowledge and apply coding knowledge

E T 272. Electronic Devices II**4 Credits (3+3P)**

Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks.

Prerequisite: A grade of C- or better in E T 246.

Learning Outcomes

1. Design ideal operational amplifier (opamp) circuits.
2. Determine the frequency response of BJT and MOSFET amplifier circuits.
3. Predict the impact of non-ideal properties of opamps on opamp circuits.
4. Design opamp integrator and differentiator circuits.
5. Implement electronic wave-generating and wave-shaping circuits.
6. Solder and layout surface-mount printed-circuit boards (PCBs).
7. Simulate and test opamp and transistor-amplifier circuits.

E T 273. Advanced Networking Communications**4 Credits (2+4P)**

Explores advanced networking communications to include Wireless Networking, Virtualization and Cloud Computing, Subnets and VLANs, Network Risk Management, Network Security Design, Network Performance, and WANS. The course covers the examination objectives and detailed preparation for students to take the CompTIA Network+ exam.

Prerequisite: E T 153.

Learning Outcomes

1. Identify, describe, and apply wireless transmission characteristics and standards.
2. Explain the benefits of cloud virtualization and cloud computing.
3. Explain the purpose of network segmentation and describe how VLANs work and how they are used.
4. Identify basic concepts of network risk management and configure devices for increased security.
5. Identify network design security features and discuss options in network access control.
6. Use tools to evaluate network performance and discuss best practices for incident response and disaster recovery.
7. Explain characteristics of WAN technology and troubleshoot connection methods.

E T 276. Electronic Communications**3 Credits (2+2P)**

Antennas, transmission devices, A-M and F-M transmission and detection, pulse systems, microwave systems.

Prerequisite(s): E T 246.

E T 280. Web Design and Multimedia**3 Credits (3)**

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.

Learning Outcomes

1. Create multiple frontend development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

E T 282. Digital Electronics**4 Credits (3+3P)**

Applications of digital integrated circuits, multiplexers, counters, arithmetic circuits, and microprocessors.

Prerequisite(s)/Corequisite(s): (E T 190 or E T 184). Prerequisite(s): E T 182.

E T 283. Hardware PC Maintenance**3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer hardware components.

Prerequisite(s): E T 120 or E T 122.

E T 284. Software PC Maintenance**3 Credits (3+1P)**

Installing, configuring, troubleshooting, and maintaining personal computer operating systems.

Prerequisite(s): E T 120 or E T 122.

E T 285. Advanced Information Security**3 Credits (3)**

The course covers detailed analysis of network security, including security operations and policy adherence; internal and external vulnerabilities; methods of identifying, controlling and managing system access, and the protection of system information.

Prerequisite(s)/Corequisite(s): E T 283. Prerequisite(s): E T 156.

E T 286. Information Security Certification Preparation**4 Credits (4)**

The course covers the examination objectives and detailed preparation for a certification in information security.

Prerequisite(s): E T 285.

E T 290. Networking Wireless Communication**3 Credits (3+1P)**

This course provides an introduction to wireless networking and communications. Some of the topics covered are protocols, transmission methods, and IEEE 802.11 standards. Wireless LAN (WLAN) fundamentals, devices, and security, cellular telephony, broadband, and satellite communications.

Prerequisite: E T 273.

E T 291. PC Forensics and Investigation**3 Credits (3)**

Introduction to computer forensics and investigative fundamentals. Topics include understanding computer forensic and investigation law and requirements, processing crime and incident scenes, and the extraction, preservation, analysis and presentation of computer-related evidence.

Prerequisite(s): E T 120 or E T 122.

E T 300. Special Topics**1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

E T 305. Introduction to Product Design**3 Credits (2+3P)**

The process of designing an innovative product for a real customer. Working through ideas, prototypes, 3-D models, concept validation, and entrepreneurship.

Prerequisite: A grade of C- or better in (COMM 1115G or COMM 1130G or AXED 2120G or HNRS 2175G) or consent of instructor for non-MET majors.

Prerequisite/Corequisite: E T 210 and E T 217.

Learning Outcomes

1. Learn and follow design process.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting ideas and concepts orally.
4. Learn and apply creative problem-solving techniques.
5. Perform interviews with customer.
6. Translate customer needs into product specifications.
7. Design novel product for customer.
8. Build low-resolution prototype of product.
9. Develop a recognition of the importance of innovation and entrepreneurship.

E T 306. Fundamental and Applied Thermodynamics**3 Credits (3)**

First and second laws, properties of substances, thermodynamic cycles including power generation and refrigeration.

Prerequisite: A grade of C- or better in the following: CHEM 1120G and ENGR 233 and (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).

Corequisite: E T 306 L.

Prerequisite/Corequisite: ENGR 140, and (MATH 1440 or MATH 1521G).

Learning Outcomes

1. Students will acquire an understanding of the physical concepts and basic principles of fundamental and applied thermodynamics.
2. Students will become acquainted with the problem-solving methods and tools in the field of applied thermodynamics,
3. Students will gain experience through practice in the implementation of systematic, fundamental approaches to solving problems in applied thermodynamics.

E T 306 L. Thermodynamics Lab**1 Credit (3P)**

Applications of thermodynamic theory to lab devices. Practice in testing, instrumentation, and data collection.

Corequisite: E T 306.

Learning Outcomes

1. Effectively communicate results of laboratory work and in-class studies in written formal technical reports.
2. Present one lab experiment through a PowerPoint presentation.
3. Find thermodynamic properties through lab experiments.
4. Describe performance indicators of a laboratory refrigeration cycle and a heat engine.
5. Describe power plant operation.

E T 308. Fluid Technology**3 Credits (3)**

Application of basic principles of fluid mechanics to practical applied problems.

Prerequisite: A grade of C- or better in both, (MATH 1435 or MATH 1511G) and (E T 240 or ENGR 233).

Corequisite: E T 308 L.

Learning Outcomes

1. Solve hydrostatic problems.
2. Describe and measure physical properties of a fluid.
3. Describe the motion of fluids.
4. Apply conservation equations.
5. Design pipeline and pump systems.

E T 308 L. Fluid Technology Lab**1 Credit (3P)**

Measurements in fluid statics, dynamics, and hydraulic systems.

Corequisite: E T 308.

Learning Outcomes

1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Experimentally find properties of fluids.
3. Experiment head losses in pipe flows.
4. Analyze pipeline systems and open channel flows.
5. Analyze flow regimes and equipment selection.

E T 309V. Manufacturing: History and Technology**3 Credits (3)**

The history of manufacturing, the technology on which it is based, and its impact on society.

E T 310. Applied Strength of Materials**3 Credits (3)**

Application of principles of strength of materials to practical design and analysis problems.

Prerequisite: A grade of C- or better in E T 240 or ENGR 233.

Corequisite: E T 310 L.

Prerequisite/Corequisite: ENGR 190 or MATH 1440 or MATH 1521G or MATH 1521H.

Learning Outcomes

1. To obtain knowledge of basic engineering materials and their use in civil and mechanical construction.
2. To perform basic structural analysis, stress, strain and deformation calculations as they apply to current engineering practices.
3. To conduct appropriate experiments in the laboratory as they apply to straight of materials and be able to interpret the results.
4. To effectively communicate results of laboratory work and in-class studies in written memoranda, business letters, and formal technical reports.
5. To recognize that the field of engineering materials is constantly changing and therefore, needs to be studied throughout one's career.

E T 310 L. Applied Strength of Materials Lab**1 Credit (3P)**

Testing and analyzing the physical properties of materials. cursory review of Excel, PowerPoint, FEA, Instron machine, and testing standards.

Corequisite: E T 310.

Learning Outcomes

1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Demonstrate an understanding of the tensile, compressive, shear, torsional and buckling properties of basic materials through hands-on testing per ASTM Standards.
3. Evaluate the results of the hands-on laboratory testing through modeling exercises using SOLIDWORKS simulations.
4. Effectively communicate industry practices through oral presentations of ASTM standards.

E T 314. Communications Systems I**3 Credits (3)**

Circuits and devices used for transmission, reception, and processing of RF signals. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in both, E T 246 and (MATH 1250G or higher).

Learning Outcomes

1. Analyze analog and digital communication systems.
2. Apply the fundamental communication concepts of AM and FM techniques.
3. Build an AM/FM communication system.
4. Apply basic antenna theory and satellite communication theory.

E T 317. Advanced Manufacturing and Design**3 Credits (3)**

Advanced 3-D modeling with current engineering design practices. Students will use SolidWorks add-ins such as CAMWorks, Product Data Management (PDM), and Model-Based Definition in conjunction with Geometric Dimensioning and Tolerancing (GD&T) practices. Students will have the opportunity to take the Certification SolidWorks Professional Exam (CSWP).

Prerequisite: A grade of C- or better in both, E T 210 and E T 217 or ENGR 217.

Learning Outcomes

1. Create manufacturing drawing packages in accordance with ANSI.
2. Relate design data using proper geometric dimensioning and tolerancing practices.
3. Knowledge of advanced manufacturing processes.
4. Knowledge of requirements design for manufacturability (DFM).
5. Write and understand G-Code toolpaths.
6. Use CAD/CAM systems to create toolpaths.
7. Operate and setup CNC machining center.
8. Work in a group and operate effectively on a team.
9. Use creative and technical thinking skills in design.

E T 324. Signal Processing and Filtering**4 Credits (3+3P)**

Application of digital and analog signal conversion models. Discrete time signals and systems. Time and frequency domain concepts. Presentation of Fourier and Z transforms. Application of analog and digital signal filtering with and without feedback.

Prerequisite: A grade of C- or better in E T 272 and (ENGR 140 or E T 262).

Prerequisite/Corequisite: (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).

Learning Outcomes

1. Analyze signals and systems and differentiate between discrete and continuous-time signals and systems.
2. Determine the impulse response of a differential or difference equation.
3. Apply the convolution theorem for continuous-time signals to determine the response of linear systems.
4. Evaluate the Fourier series of periodic signals.
5. Apply bilateral Laplace transforms for continuous signals and Z transforms for discrete signals.
6. Apply the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous-time signals in discrete time.
7. Design and analyze signals and systems using the programming language MATLAB and /or Simulink.

E T 328. Kinematics of Machines**3 Credits (2+3P)**

Kinematic analysis of machine elements using linkages, cams, and gears. Applied design of mechanical systems using SolidWorks simulation and Excel modeling.

Prerequisite: A grade of C- or better in both, E T 210 and (E T 241 or ENGR 234).

Prerequisite/Corequisite: E T 305.

Learning Outcomes

1. Design mechanical device with specific points of motion to solve engineering problem.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting technical concepts in writing and orally.
4. Develop understanding of classic four bar mechanisms, including crank-rocker, crank-crank, double-rocker, and crank-slider.
5. Using algebra and trigonometry, analyze points of motion for displacement, velocity, and acceleration.
6. Using SolidWorks Motion Analysis, analyze points of motion for displacement, velocity, and acceleration.
7. Reverse-engineer a Franz Rouleaux mechanism.

E T 332. Applied Design of Structures I**4 Credits (3+3P)**

An introduction to structural analysis and design. Use of various building codes for development of allowable and factored loads on structures. Allowable stress and strength design concepts for structural components using concrete and steel. Required use of computer software such as spreadsheets, databases, and self-developed programs and design aids.

Prerequisite: A grade of C- or better in both, E T 310 and (ENGR 190 or MATH 1440 or MATH 1521G or higher).

Learning Outcomes

1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design structural components of a system, component, or process to meet desired needs.
3. Identify, formulate, and solve structural analysis problems.
4. Describe professional and ethical responsibility.
5. Communicate effectively with peers and faculty.

E T 339. Introduction to Digital Forensics and Incident Response**3 Credits (2+3P)**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.

Prerequisite: A grade of C- or better in both, E T 255 and E T 160.

Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

E T 344. Microcomputer Systems**3 Credits (2+3P)**

Microcomputer and/or microcontroller systems applications and architectures with a software emphasis using programming languages. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or higher).

Prerequisite/Corequisite: E T 362.

Learning Outcomes

1. Compare and contrast microprocessor architectures and their characteristics.
2. Configure a Nios II microprocessor architecture core on an FPGA.
3. Write programs in assembly language targeting the Nios II microprocessor.
4. Write programs in C targeting the Nios II microprocessor.
5. Present, demonstrate and document a team project.

E T 354. Soil and Foundation Technology**4 Credits (3+3P)**

Fundamentals of investigation of soil properties and their importance in design, construction, and testing as related to buildings, roads, dams, and other structures. Design of foundations considering slope stability, bearing capacity and settlement.

Prerequisite: A grade of C- or better in E T 254.

Prerequisite/Corequisite: E T 310.

Learning Outcomes

1. Demonstrate an understanding of the basic soil types and the accepted soil classification systems: USCS, AASHTO, USDA.
2. Demonstrate an understanding of the various engineering properties of soils and how they apply to the built environment: compaction, permeability, consolidation, shear strength and stress distribution.
3. Perform advance calculations on lateral earth pressure, retaining structures and slope stability.
4. Perform basic designs of shallow foundations and pile structures.
5. Demonstrate an ability to perform laboratory tests: soil classification, Atterburg Limits, compaction (proctors), permeability, shear strength, and compression. Confirm these abilities through completion of the NMDOT soil testing certification program.

E T 355. Site/Land Development and Layout**3 Credits (3)**

Techniques, methods, and takeoffs for infrastructure layout, site plan design, grading, earthwork, utilities, road construction. Students must be in Junior or Senior standing to enroll.

Prerequisite: A grade of C- or better in E T 143 or DRFT 143 or DRFT 153.

Learning Outcomes

1. Describe the purpose of Land Development and its process.
2. Define Feasibility and Programming (Environmental policy, Environmental Site Feasibility, Engineering Feasibility) for land development.
3. Base Map Preparation (Control Surveys, Boundary Surveys Topographic Surveys).
4. Examine Flood Plain Studies (FEMA) and Preliminary Hydrological Analysis.
5. Compute the TOC/Intensity of rainfall on a property, runoff for pre/post-development, and peak flow.
6. Implement types of Grading - Earthwork (end section method)/production estimations/Preliminary layout/Grading work Grid Method).
7. Analyze asphalt designs for different types of cross-sections.

E T 360V. Technology in Business and Society**3 Credits (2+2P)**

Examination of how technology affects business and society with specific attention to understanding the role of technical personnel and their interaction with nontechnical personnel.

E T 362. Software Technology II**3 Credits (3)**

Topics include problem analysis, object-oriented programming (OOP), structured logic, and development concepts.

Prerequisite: A grade of C- or better in either E T 262 or ENGR 140.

Prerequisite/Corequisite: MATH 1250G or Higher.

Learning Outcomes

1. Set up and use a rich programming environment for programming with Python
2. Analyze existing code
3. Employ effective use of basic programming and basic troubleshooting
4. Employ effective use of Object-Oriented Programming (OOP) and troubleshooting
5. Apply testing and documentation best practices

E T 377. Computer Networking I**3 Credits (2+2P)**

Topics include the principles and structure of the OSI model, IP addressing, media, LANs, TCP/IP networks, routing protocols (RIPv2, EIGRP, OSPF) and their advanced functionality, as well as VLANs and inter-VLAN communication. This course focuses on the architecture of networks, the configuration of devices, how to identify and resolve common issues, and troubleshooting (from physical to transport layers).

Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or Higher).

Learning Outcomes

1. Define and distinguish the role of a network administrator (from other roles in the IT world)
2. Identify the OSI model, its layers, and relationship to TCP/IP model
3. Identify different cable media and networking devices and their use
4. Design, configure, and troubleshoot basic networks.
5. Identify MAC, IPv4, and IPv6 addressing
6. Apply different techniques for IP allocation and subnet design (IPv4)
7. Use Cisco IOS software for basic switch and router configurations
8. Configure and troubleshoot basic setup for static and dynamic routing protocols

E T 381. Renewable Energy Technologies**3 Credits (3)**

Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of renewable energy technologies and performance improvements. This includes solar, wind, hydro, ocean, biomass, and geothermal energies.
3. Understand the benefits and disadvantages of using renewable resources.
4. Research or design a renewable energy system as a class project.

E T 382. Solar Energy Technologies**3 Credits (2+3P)**

Solar energy technologies, including topics in passive, solar thermal, and photovoltaic systems. Theory, practical applications, safety considerations and the economics of solar renewable energy systems compared to conventional systems.

Prerequisite: A grade of C- or better in MATH 1220G.

Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of photovoltaic and solar thermal energy technologies and performance improvements.
3. Evaluate the economics of implementing a solar system.
4. Design and size a PV or solar thermal energy system as a class project.

E T 384. Wind and Water Energy Technologies**3 Credits (3)**

Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of wind and water energy technologies and performance improvements.
3. Evaluate the economics of implementing wind or water systems.
4. Design and size a wind or water energy system as a class project.

E T 386. Sustainable Construction and Green Building Design**3 Credits (3)**

Sustainable Building materials, methods, and techniques including green architecture and design, codes, standards and specifications.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Demonstrate an understanding of the basic principles of Green Building: sustainability, life-cycle costing, triple bottom line, return periods and unintended consequences.
2. Interpret the various categories present in the LEED certification process and other green certification systems commonly used.
3. Evaluate different "green" technologies as they apply to the student's area of interest.
4. Evaluate energy efficiency scenarios and resulting cost analyses using RETScreen and RESCheck softwares.
5. Navigate the various certification opportunities as they apply to the Green Building industry.

E T 396. Heat Transfer and Applications**3 Credits (2+3P)**

Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design.

Prerequisite: A grade of C- or better in both E T 306 and E T 308.

Learning Outcomes

1. Understand the concepts and basic principles of fundamental and applied heat transfer.
2. Model and solve engineering problems involving one, two, or three heat transfer modes: conduction, convection, and radiation.
3. Analyze the performance of industrial equipment like heat exchangers.
4. Validate theoretical concepts through heat transfer lab experiments.

E T 398. Digital Systems**4 Credits (3+3P)**

Analysis, design, implementation, and testing of digital systems, including microprocessor blocks, using state machine logic, FPGAs, and hardware description language programming. May be repeated up to 4 credits.

Prerequisite: A grade of C- or better in both (E T 282 or ENGR 130) and (MATH 1250G or higher).

Prerequisite/Corequisite: E T 362.

Learning Outcomes

1. Apply design, synthesis, and analysis methods for digital systems that incorporate programmable logic devices (FPGAs).
2. Utilize CAD tools such as Altera Quartus II to design digital systems.
3. Evaluate and apply methods to analyze the timing behavior and to detect timing hazards in digital circuits.
4. Apply methods for analysis and design of sequential digital circuits with feedback.
5. Design complex circuits using VHDL Hardware Description Language (VHDL) for programming FPGA systems.

E T 400. Special Topics**1-3 Credits**

Directed study or project. May be repeated for a maximum of 6 credits.

Prerequisite: consent of department head.

E T 401. Heating and Air-Conditioning Systems**3 Credits (3)**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 306.

Prerequisite/Corequisite: E T 396.

Learning Outcomes

1. Master the use of thermodynamics software, EES for this course, and design software, HVAC Calc for this course.
2. Understand the principles of indoor/outdoor psychrometrics.
3. Calculate the heating/cooling loads.
4. Design/size an HVAC system for a given building through a class project.

E T 402. Instrumentation**3 Credits (2+3P)**

Sensors/transducers, signal conditioning and transmission for measurement and control systems. Student project in an area of instrumentation and/or control is required. Students be in Senior level standing to enroll.

Prerequisite/Corequisite: E T 396 or E T 398.

Learning Outcomes

1. Apply physical concepts, operational principles, and components of basic instrumentation and control in industrial process systems.
2. Learn relevant problem-solving methods and aspects of good practice.
3. Use LabView data acquisition systems, PLC ladder logic, and basic Arduino controllers.
4. Prototype a control system through a class project.

E T 410. Senior Seminar**1 Credit (1)**

Transition from academics to business and industry. Students must be senior standing in E T majors to enroll. May be repeated up to 1 credit.

Learning Outcomes

1. Explain the path to professional licensure (CET, ECET, MET).
2. Implement a plan to test and pass the fundamental exam (CET, ECET, MET).
3. Identify and work towards completing different certifications used in industry, and work towards (IET).

E T 412. Highway Technology**3 Credits (3)**

Road-vehicle performance, geometric alignment, traffic analysis, highway materials, pavement design, and plan and profile development.

Prerequisite: A grade of C- or better in E T 354.

Learning Outcomes

1. Design of a roadway including geometric design, materials selection, pavement design, and drainage.
2. Develop an understanding of design criteria based on traffic characteristics.
3. Interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 418. Applied Hydraulics**3 Credits (3)**

Introduction to hydrology, hydraulic equations, hydraulic cross-sections, control structures, and collection and distribution of water, wastewater, and storm runoff using closed conduit and open channel flow. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 308.

Learning Outcomes

1. Perform basic rainfall/runoff calculations using the Rational Method, TR-fifty-five and the Unit Hydrograph method.
2. Design hydraulic conveyance structures using Manning's equation and basic culvert equations, both by hand and various software packages.
3. Perform advanced calculations of pipe flow and head loss, both by hand and various software packages.
4. Evaluate pumping scenarios and pumping design, both by hand and various software packages.
5. Demonstrate an understanding of basic groundwater hydraulics.

E T 420. Senior Internship**1-6 Credits**

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. Taken in the senior year of program.

Prerequisites: Senior standing in E T.

E T 421. Senior Project**3 Credits (3)**

Project in an area of civil engineering technology conducted under the direction of civil engineering technology faculty member. Project must be one that can be completed within a semester and of sufficient complexity for 3 credits. Taken last semester of program. May be repeated up to 3 credits.

Learning Outcomes

1. Write a transmittal letter in a format consistent with industry practices.
2. Develop a scheduling table delineating the various project stages.
3. Develop a table of contents to organize all work documents.
4. Use the knowledge learned in CET courses to develop/design a project and prepare a professionally written report.
5. Communicate effectively with the faculty advisor and industry mentor.
6. Develop skills to work independently or in teams on a self-paced project.

E T 426. Analysis and Design of Machine Elements**3 Credits (2+3P)**

Analysis and design of power transmission components, including: gears, sprockets, belts, chains, bearings, and shafts. Experiential design project using SolidWorks and Excel modeling.

Prerequisite: A grade of C- or better in both ENGR 234 and E T 310.

Prerequisite/Corequisite: E T 305.

Learning Outcomes

1. Design mechanical device with specific machine elements to solve engineering problem.
2. Develop experience working in a team to solve design problems.
3. Develop experience presenting technical concepts in writing and orally.
4. Apply strength of materials concepts to design machine elements.
5. Learn about various types of machine elements, including shafts, sheaves, gears, sprockets, bearings, fasteners, retaining rings, o-rings, and motors.
6. Analyze the performance of various types of machine elements, including shafts, sheaves, gears, sprockets, and bearings.
7. Using SolidWorks Simulation, design and analyze machine elements and mechanical systems.
8. Conduct FEA simulation and validate results mathematically.

E T 432. Applied Design of Structures II**4 Credits (3+3P)**

Continuation of E T 332. Design of structural systems and study of their responses. Wood and masonry systems included.

Prerequisite: A grade of C- or better in E T 332.

Learning Outcomes

1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design a system, component, or process to meet desired needs.
3. To effectively function as a member of a team while designing, constructing and testing structural scale model.
4. To identify, formulate, and solve engineering problems including material selection and cost analysis.
5. Recognize of professional and ethical responsibility.

E T 435. Senior Project**3 Credits (2+3P)**

Capstone course. Practical application of student's cumulative knowledge to an assigned design projects. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required.

Learning Outcomes

1. Demonstrate an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline.
2. Demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline.
3. Demonstrate an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.
4. Demonstrate an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.
5. Demonstrate an ability to function effectively as a member as well as a leader on technical teams.

E T 439. Advanced Digital Forensics and Incident Response**3 Credits (3)**

Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.

Prerequisite: A grade of C- or better in both, E T 339 and E T 377.

Learning Outcomes

1. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
2. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

E T 444. Hardware and Software Senior Design**3 Credits (2+3P)**

The design, development, implementation, documentation and formal demonstration of a microprocessor-based application to solve an engineering problem. Emphasis on microprocessor architectural concepts and software interfacing. A student project is required. Students must be in senior standing to enroll. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in both, E T 344 and E T 398.

Learning Outcomes

1. To design, analyze and simplify digital logic circuits for practical problems.
2. To understand basic and complex digital logic circuits, such as memory, registers, and other arithmetic circuits.
3. To design sequential digital circuits using basic digital gates in Moore and Mealy model.
4. To design Finite State Machines and implement them on an FPGA board.
5. To interface different sensors and user inputs in VHDL and implement them on an FPGA board.
6. To complete a design project, working in teams, solving a real-life problem, and demonstrate their practical solution.

E T 454. Advanced Construction Technology**3 Credits (3)**

Contractor design and construction methods concerning formwork, special foundations, shoring, excavations, pilings, steel erection, and various material handling components.

Prerequisite: E T 354 and E T 355.

E T 455. Cost Estimating and Scheduling**3 Credits (3)**

Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques.

Prerequisite: junior or senior standing in E T.

E T 456. Applied Power Technologies**4 Credits (3+3P)**

Basic elements of modern power systems, energy sources, substation configuration, load cycles, and three-phase circuits. Students will gain experience in power factor correction, transmission line configurations and impedance, voltage regulation of transformers, and the per-unit system. Study of load flow, fault analysis, and economic operations is included. Students must be in junior or senior standing in order to enroll.

Prerequisite: A grade of C- or better in the following: (ENGR 190 or MATH 1435 or MATH 1511G) and E T 272 and ((PHYS 1240G and PHYS 1240L) or (PHYS 1320 and PHYS 1320L)).

Learning Outcomes

1. To apply concepts of electronics, magnetism and induction.
2. To solve single and three phase transformers circuits.
3. To understand different operations of DC machines and generators.
4. To analyze single phase and three phase power circuits in per-unit analysis.
5. To analyze transmission lines for power loss and power efficiency.
6. To understand load flow, fault analysis and economic operations of the power system generation and transmission.
7. To describe modern power systems, energy sources and substation configurations.

E T 458. Web Development and Database Applications**3 Credits (3)**

Design, planning, and building of interactive and dynamic web applications which are customizable and contain real-time information. Topics include relational databases, object oriented programming, secure-coding practices and web security, user authentication and personalization, as well as front-end and back-end technology integration.

Prerequisite: A grade of C- or better in both, E T 362 and E T 280.

Learning Outcomes

1. Setting up a development server
2. Read, design, and write code for backend web dev.
3. Design, create, and access databases that support web applications.
4. Implement effective security and authentication on Web applications

E T 459. Construction Technology and Management**3 Credits (3)**

This is a Technical Specialty course that builds on topics presented in the construction sequence thus far: E T 154, E T 254, E T 354, and E T 355. The course introduces students to the different civil engineering approach to construction and management, including planning, construction estimating & scheduling, foundations, formwork, concrete work, steel fabrication and erection installation, equipment basics, quality control, and safety. Methods and techniques involved in construction including use of Primavera Project Management® software.

Prerequisite/Corequisite: E T 354 and E T 355.

Learning Outcomes

1. Understand the basic concepts of construction planning, cost estimation, scheduling, and types of project management
2. Obtain basic knowledge on techniques to construct structures based on site condition
3. Develop work breakdown system and quantity take-offs
4. Develop project cost estimation for different construction projects
5. Prepare work schedule for construction project
6. Identify and implement the suitable method and equipment to construct various structures.

E T 463. Enterprise Linux Administration**3 Credits (3)**

Advanced Linux Includes an advanced look at the use of Coding repositories, Linux-based containers, virtual machines, and scripting tools including Dockerfiles, Vagrantfiles, and Ansible.

Prerequisite: A grade of C- or better in both, E T 255 and E T 362.

Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrastructure management software to deploy defined roles in multiple environments.

E T 464. Windows Enterprise Administration**3 Credits (3)**

Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.

Prerequisite: A grade of C- or better in E T 160 and (E T 262 or ENGR 140 or C S 172).

Learning Outcomes

1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational Structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPvfour and IPvsix.
4. Analyze existing cmd shell and PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-domain trust relationship.
7. Employ effective use of the WDS service to deploy template images.

E T 471. Transportation Engineering and Technology**3 Credits (3)**

Learn the principles of transportation engineering and technology with a focus on highway engineering and traffic analysis. Provide a basic skill set that will allow a student to address most of the transportation problems. Provide a foundation for future coursework in transportation should a student wish to pursue further coursework in the field.

Prerequisite: A grade of C- or better in E T 354.

Learning Outcomes

1. To introduce students to techniques for designing a roadway including geometric design, materials selection, pavement design, and drainage.
2. To help students develop an understanding of design criteria based on traffic characteristics.
3. Assess student's ability to: interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 472. Intelligent Transportation Systems (ITS)**3 Credits (3)**

Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate traffic flow theory, telecommunication, and information technology applications in transportation.
2. Discover Intelligent Transportation System (ITS) architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance and in-vehicle systems, and traffic signal timing.
3. Apply knowledge of the ITS to select traffic engineering as a career path or apply the knowledge in their engineering or engineering technology career.

E T 475. Special Topics in Information Technology**3 Credits (3)**

Contemporary topics in Information Technology.

Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.

Learning Outcomes

1. Students will learn two way Bluetooth, Wi-Fi, and NFC communication technologies
2. The student will practice building and programming IOT prototype devices
3. The student will develop customer value proposition and perform one round of customer discovery
4. The student will prototype their IOT device
5. The student will demonstrate their IOT device
6. The student will learn to integrate IOT devices into IT architecture

E T 477. Computer Networking II**3 Credits (2+2P)**

Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security and firewall, network monitoring and forensics, wireless networks, high-speed optical networks and Internet.

Prerequisite: A grade of C- or better in E T 377.

Learning Outcomes

1. Demonstrate an understanding of key fundamental concepts of networking.
2. Apply networking concepts to design networks for real-life application scenarios using applicable software.
3. Configure network hardware such as computers, switches, and routers.
4. Troubleshoot, analyze, and solve network problems with applicable software.

E T 480. Innovation and Product Development**3 Credits (3)**

Experiential product design and development. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot.

Prerequisite/Corequisite: (COMM 1115G or COMM 1130G or ACOM 1130G or HNRS 2175G).

Learning Outcomes

1. Develop an understanding of Value Proposition Design methodology and apply to design product, service, or app.
2. Develop an understanding of Lean LaunchPad methodology and apply to design product, service, or app.
3. Develop a general understanding of the Business Model Canvas.
4. Develop experience applying scientific method to validate or invalidate hypotheses.
5. Develop experience working through the design process and develop novel design for target customer(s).
6. Develop experience presenting ideas and concepts in writing.
7. Learn and apply creative problem-solving techniques.

E T 481. Engineering Principles for Elementary Teachers**3 Credits (3)**

Introduction to hands-on engineering principles and projects useful for application in the Elementary classroom. Restricted to: Masters of Arts in Education in Elementary Mathematics and Science majors.

Learning Outcomes

1. An ability to engage in the problem-solving process within engineering applications.
2. An ability to put scientific theory into practice within an engineering application.
3. Knowledge of the use of engineering concepts with hands-on activities.
4. An ability to make sense of complex engineering-related phenomenon within an elementary school frame.

E T 482. Manufacturing Technology**3 Credits (2+2P)**

Fundamentals of computer aided manufacturing (CAM) and computer numerical control (CNC) machining. Students will learn how to program several variants of CNC machines, using both G/M code programming and computer aided manufacturing software. Emphasis will be on the effective design of parts to be made on CNC machines along with a hands on lab to give students experience on CNC machines. Students will individually design, manufacture, and keep items such as keychains, bottle openers, LED clocks, ergonomic handles, and license plates. Students must be in senior level standing to enroll.

Prerequisite: A grade of C- or better in both, E T 210 and E T 217.

Learning Outcomes

1. Various

E T 483. Mobile App Programming and Development**3 Credits (3)**

Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development.

Prerequisite: A grade of C- or better in both, ICT 152 and (E T 377 or ICT 377)), or Consent of Instructor.

Learning Outcomes

1. The student will learn to create a modern and flexible mobile device User Interface using Java
2. The student will develop a high functioning prototype their mobile app
3. The student will implement a business model canvas including development of a customer value proposition and a minimum of one round of customer discovery
4. The student will implement database and information storage using a mobile device
5. The student will implement the developer's dashboard for their mobile app
6. Student will publish and monetize their mobile app

E T 485. White Hat System Testing**3 Credits (3)**

System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation.

Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.

Learning Outcomes

1. The student will practice modern methods for penetration testing
2. The student will demonstrate advanced ethical hacking methods
3. The student will evaluate in-place security systems
4. The student will run-through simulated attacks and system break-ins
5. The student will learn to prepare detailed reports on system vulnerabilities and weaknesses

E T 490. Selected Topics**1-3 Credits**

Selected topics in engineering technology and related areas.

Prerequisite: consent of instructor.

E T 505. Special Topics in Information Technology**3 Credits (3)**

Contemporary topics in Information Technology Restricted to: M-IT majors. May be repeated up to 9 credits.

Learning Outcomes

1. Various

E T 539. Advanced Enterprise Security**3 Credits (3)**

This course provides the student with an overview of enterprise cybersecurity and a foundation for understanding the critical issues of protecting digital and information assets. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate an understanding of information security concepts and risk management.
2. Demonstrate an understanding of Intrusion Detection and Prevention Systems and Other Security Tools.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

E T 551. Enterprise Architecture I**3 Credits (3)**

A study of current enterprise architecture methodologies, tools, and techniques. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate the ability to utilize and develop architectural enterprise artifacts.
2. Assess multiple enterprise architecture methodologies.
3. Demonstrate IT architecture landscaping capability.
4. Assess integrating IT initiatives utilizing the enterprise architecture processes.

E T 552. Enterprise Architecture II**3 Credits (3)**

Advanced topics in enterprise architecture including availability, access, and architecture map development. Restricted to: M-IT majors.

Prerequisite: A grade of C- or better in E T 551.

Learning Outcomes

1. Demonstrate the differences and similarities in multiple enterprise architectures.
2. Demonstrate the ability for independent research on enterprise architectures.
3. Assess architectural artifacts for impact on IT planning and implementation.

E T 555. Virtualization**3 Credits (3)**

An analysis and review of system and IT virtualization techniques.

Restricted to: M-IT majors.

E T 562. Development and Operations**3 Credits (3)**

Software development including Python scripting. Operations programming. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate a basic knowledge of Operations Management and its relationship to DevOps.
2. Demonstrate knowledge in current software used in DevOps.
3. Apply DevOps practices to a software deployment workflow.
4. Demonstrate the ability to define a Continuous Integration pipeline with automated testing.
5. Students will apply the continuous feedback principles to project monitoring.
6. Apply best practices to build security into DevOp projects.

E T 577. Advanced Computer Networking**3 Credits (3)**

Advanced networking design and analysis. Modernization of infrastructures. Restricted to: M-IT majors.

E T 583. Mobile App Programming and Development**3 Credits (3)**

Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development. Restricted to: M-IT majors.

E T 585. White Hat System Testing**3 Credits (3)**

System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation. Restricted to: M-IT majors.

Learning Outcomes

1. Describe cryptology.
2. Identify common information-gathering tools and techniques.
3. Perform system hacking, and web and database attacks.
4. Analyze vulnerabilities exploited by hackers.
5. Identify common types of malware and the threats they pose.
6. Perform network traffic analysis and sniffing by using appropriate tools.
7. Identify security controls and defensive technologies.

E T 595. Capstone Projects in Information Technology**3 Credits (3)**

Capstone course. Practical application of student's cumulative Information Technology knowledge to an assigned design projects. Project management skills.

Learning Outcomes

1. Demonstrate ability to manage complex work-related IT technical projects.
2. Demonstrate the ability to create an IT engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project timeline.
4. Demonstrate the ability to work in teams and execute project.
5. Demonstrate advanced project goal setting, skills assessment, and weekly updates.

ECDV-ECONOMIC DEVELOPMENT

ECDV 550. Introduction to Local and Regional Development**3 Credits (3)**

Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.

ECDV 590. Special Topics**1-3 Credits (1-3)**

Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.

ECDV 596. Individual Study**1-3 Credits (1-3)**

Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.

ECDV 651. Economic Development Theory**3 Credits (3)**

Builds upon a general understanding of microeconomic and macroeconomic theory to focus specifically on theories of economic development at all levels. Prerequisites: AEEC 501 and 502

ECDV 661. Regional Economic Modeling**3 Credits (3)**

Introduction to the tools and methods of regional economic development analysis. May be repeated up to 3 credits. Restricted to: ECDV majors.

Prerequisite(s): AEEC 501, AEEC 502, and AEEC 540.

ECDV 664. Population Economics**3 Credits (3)**

Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.

ECDV 668. Economic Development Finance**3 Credits (3)**

Focuses on the tools and methods of economic development finance.

ECDV 670. Research in Economic Development**3 Credits (3)**

Intense examination of the academic literature on economic development at all levels.

Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 671. Sustainable Economic Development**3 Credits (3)**

Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment.

Prerequisites: AEEC 501, AEEC 502 and AEEC 540.

ECDV 673. Research Methods**3 Credits (3)**

An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized.

Prerequisites: AEEC 501, AEEC 502 and AEEC 540.

ECDV 681. Urban Economic Development**3 Credits (3)**

Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis.

Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 682. Rural Development**3 Credits (3)**

Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis.

Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 683. Seminar in National Economic Development**3 Credits (3)**

Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects.

Prerequisites: ECDV 681 and ECDV 682.

ECDV 692. Seminar in Economic Development**3 Credits (3)**

Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits.

Prerequisite: Completion of at least nine semester hours of ECDV courses.

ECDV 694. Internship**1-9 Credits (1-9)**

Internship in Economic Development. May be repeated up to 9 credits. Restricted to: ECDV majors. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): Completion of core requirements of Doctor of Economic Development.

ECDV 699. Doctoral Project**1-9 Credits (1-9)**

Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

ECED-EARLY CHILDHOOD EDUCATION

ECED 1110. Child Growth, Development, and Learning**3 Credits (3)**

This basic course in the growth, development, and learning of young children, prenatal through age eight, provides students with the theoretical foundation for becoming competent early childhood professionals. The course includes knowledge of how young children grow, develop and learn. Major theories of child development are integrated with all domains of development, including biological-physical, social, cultural, emotional, cognitive and language. The adult's role in supporting each child's growth, development and learning is emphasized. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of developmental stages, processes, and theories of growth, development, and learning into developmentally appropriate practice. A.one
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child. A.two
3. Demonstrate knowledge of the significance of individual differences in development and learning.
4. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays and/or specific disabilities. A.three
5. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse abilities. A.four
6. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
7. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
8. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
9. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten 1
10. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven

ECED 1115. Health, Safety, and Nutrition**2 Credits (2)**

This course provides information related to standards and practices that promote children's physical and mental well-being sound nutritional practices, and maintenance of safe learning environments. It includes information for developing sound health and safety management procedures for indoor and outdoor learning environments for young children. The course examines the many scheduling factors that are important for children's total development, healthy nutrition, physical activity, and rest. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
2. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially and emotionally). B.two
3. Use appropriate health appraisal and management procedures and makes referrals when necessary. B.three
4. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
5. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five
6. Provide a consistent daily schedule for rest/sleep, as developmentally appropriate. B.six
7. Implement health care and educational activities for children and families based on health and a.nutritional information that is responsive to diverse cultures. B.seven
8. Assist young children and their families, as individually appropriate, in developing decision-making and interpersonal skills that enable them to make healthy choices and establish health-promoting behaviors. B.eight

ECED 1120. Guiding Young Children**3 Credits (3)**

This course explores various theories of child guidance and the practical applications of each. It provides developmentally appropriate methods for guiding children and effective strategies and suggestions for facilitating positive social interactions. Strategies for preventing challenging behaviors through the use of environment, routines and schedule will be presented. Emphasis is placed on helping children become self-responsible, competent, independent, and cooperative learners and including families as part of the guidance approach. May be repeated up to 3 credits.

Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture and society. A.six
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
3. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten
4. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
5. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
6. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
7. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths, expectations, values, and child-rearing practices. C.four
8. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
9. Demonstrate knowledge and skills in developmentally appropriate guidance techniques and strategies that provide opportunities to assist children in development positive thoughts and feelings about themselves and others through cooperative interaction with peers and adults. E.three 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this

ECED 1125. Assessment of Children and Evaluation of Programs 3 Credits (3)

This basic course familiarizes students with a variety of culturally appropriate assessment methods and instruments, including systematic observation of typically and non-typically developing children. The course addresses the development and use of formative and summative assessment and evaluation instruments to ensure comprehensive quality of the total environment for children, families, and the community. Students will develop skills for evaluating the assessment process and involving other teachers, professionals and families in the process. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Learning Outcomes

1. Demonstrate ability to choose valid tools that are developmentally, culturally, and linguistically appropriate; use the tools correctly; make appropriate referrals; and interpret assessment results, with the goal of obtaining valid, useful information to inform practice and decision making. F.one
2. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguard confidentiality and privacy. F.two
3. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for Individual family service plans (IFSP) and individual education plans (IEP). F.three
4. Demonstrate understanding of the influences of environmental factors, cultural/linguistic differences, and diverse ways of learning on assessment outcomes. F.four
5. Involve the family and, as appropriate, other team members in assessing the child's development, strengths, and needs in order to set goals for the child. F.five
6. Articulate an understanding of the distinctions and definitions of assessment concepts (e.g., screening, diagnostic assessment, standardized, testing, accountability assessment). F.six
7. Apply understanding of assessment concepts toward selection of appropriate formal assessment measures, critiquing the limitations of inappropriate measures, and discussing assessment issues as part of interdisciplinary teams. F.seven
8. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional. It standards is collaborative and open with the goal of supporting diverse children and families. F.eight
9. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the Application of this data to curriculum development and/or intervention planning. F.nine 1
10. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
11. Demonstrate knowledge and use of program evaluation to ensure comprehensive quality of the total Environment for children, families, and the community. F.eleven 1
12. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve

ECED 1130. Family and Community Collaboration 3 Credits (3)

This beginning course examines the involvement of families and communities from diverse cultural and linguistic backgrounds in early childhood programs. Ways to establishes collaborative relationships with families in early childhood settings is discussed. Families' goals and desires for their children will be supported through culturally responsive strategies. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Learning Outcomes

1. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
2. Articulate an understanding of a safe and welcoming environment for families and community members. C.two
3. Develop and maintain ongoing contact with families through a variety of communication strategies. C.three
4. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths, expectations, values, and child-rearing practices. C.four
5. Articulate understanding of the complexity and dynamics of family systems. C.five
6. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
7. Involve families and community members in contributing to the learning environment. C.nine
8. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
9. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions; family structures, relationships, stressors, and supports (including the impact of having a child with diverse abilities); home language and ethnicity. C.twelve 1
10. Demonstrate knowledge of and skill to access community resources that assist families and contribute directly or indirectly to children's positive development such as mental health services, health care, adult education, English language instruction, and economic assistance. C.thirteen 1
11. Demonstrate effective written and oral communication skills when working with children, families, and early care, education, and family support professionals. E.fourteen 1
12. Demonstrate a commitment to leadership and advocacy for excellence in programs and services for young children and their families. G.six

ECED 2110. Professionalism**2 Credits (2)**

This course provides a broad-based orientation to the field of early care and education. Early childhood history, philosophy, ethics and advocacy are introduced. Basic principles of early childhood systems are explored. Multiple perspectives on early care and education are introduced. Professional responsibilities such as cultural responsiveness and reflective practice are examined. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
2. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
3. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve
4. Demonstrate ability to adhere to early childhood professional codes of ethical conduct and issues of confidentiality. G.one
5. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two
6. Demonstrate understanding of conditions of children, families, and professionals; the historical and current issues and trends; legal issues; and legislation and other public policies affecting children, families, and programs for young children and the early childhood profession. G.three
7. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four
8. Demonstrate understanding of the early childhood profession, its multiple historical, philosophical, and social foundations, and how these foundations influence current thought and practice. G.five
9. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven

ECED 2115. Introduction to Language, Literacy, and Reading**3 Credits (3)**

This course is designed to prepare early childhood professionals for promoting children's emergent literacy and reading development. Through a developmental approach, the course addresses ways in which early childhood professionals can foster young children's oral language development, phonemic awareness, and literacy problem solving skills, fluency, vocabulary, and comprehension. . This course provides the foundation for early childhood professionals to become knowledgeable about literacy development in young children. Instructional approaches and theory-based and research based strategies to support the emergent literacy and reading skills of native speakers and English language learners will be presented. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H, or ENGL 1110M).

Learning Outcomes

1. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
2. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
3. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
4. Develop partnerships with family members to promote early literacy in the home. C.eight
5. Establish partnerships with community members in promoting literacy. C.ten
6. Demonstrate knowledge of the reading and writing components of emergent literacy at each developmental level. D.four
7. Provide and use anti-bias materials/literature and experiences in all content areas of the curriculum. D.seven
8. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E.nine
9. Use a variety of strategies during adult-child and child-child interactions and facilitate communication and dialogue of expressive language and thought. E.ten 1
10. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of literacy skills. E.eleven

ECED 2120. Curriculum Development through Play Birth through Age 4 (PreK)

3 Credits (3)

The beginning curriculum course places play at the center of curriculum in developmentally appropriate early childhood programs. It addresses content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 3 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2121.

Learning Outcomes

1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
2. Demonstrate knowledge of relevant content for young children and developmentally appropriate ways of integrating content into teaching and learning experiences for children from birth to four years of age. D.one
3. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.two
4. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.six
5. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.one
6. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two
7. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
8. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
9. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight 1
12. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E.eleven 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. E

ECED 2121. Curriculum Development through Play Birth through Age 4 (PreK) Practicum

2 Credits (2)

The beginning practicum course is a co-requisite with the course Curriculum Development through Play – Birth through Age 4. The field based component of this course will provide experiences that address curriculum content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 2 credits.

Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2120.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight

ECED 2130. Curriculum Development and Implementation Age 3 (PreK) through Grade 3
3 Credits (3)

The curriculum course focuses on developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills, is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEP's is included. Consent of instructor required. May be repeated up to 3 credits.

Prerequisite: ECED 1110, ECED 2120 and ECED 2121 (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2131.

Learning Outcomes

1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.Eleven
2. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.Two
3. Demonstrate knowledge of what is important in each content area, why it is of value, and how it links with early and later understandings within and across areas. D.Three
4. Demonstrate knowledge of the language, reading and writing components of emergent literacy at each developmental level. D.Four
5. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.Six
6. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.One
7. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.Two
8. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
9. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five 1
10. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six 1
11. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.Twelve 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. F.Nine

ECED 2131. Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum
2 Credits (2)

The beginning practicum course is a co-requisite with the course Curriculum Development and Implementation: Age 3 through Grade 3. The field based component of this course will provide experiences that address developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEPs is included. Consent of instructor required. May be repeated up to 2 credits.

Prerequisite: ECED 1110 (ENGL 1110G or ENGL 1110H or ENGL 1110M), ECED 2120, and ECED 2121.

Corequisite: ECED 2130.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.Five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.Five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.Seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.Eight

ECED 2140. Effective Program Development for Diverse Learners and their Families

3 Credits (3)

This course addresses the role of a director/administrator in the implementation of family-centered programming that includes individually appropriate and culturally responsive curriculum in a healthy and safe learning environment for all children and their families. May be repeated up to 3 credits.

Learning Outcomes

1. Describe important aspects of leadership that an administrator in an early childhood setting must demonstrate.
2. Identify and describe ways in which classrooms can have a multicultural environment.
3. Observe a classroom and identify, using photographs good practice with classroom environment.
4. Describe important aspects of a good early childhood curriculum
5. Describe how culture and socioeconomic factors influence classroom environment.

ECED 2141. Effective Program Development for Diverse Learners and their Families Practicum

2 Credits (2)

Provides opportunities for students to apply knowledge gained from Curriculum for Diverse Learners and their Families in a practicum setting. Consent of instructor required. Restricted to ECED majors. May be repeated up to 2 credits.

Corequisite: ECED 2140.

Learning Outcomes

1. Describe the requirements to maintain and enhance the physical and mental health, safety, and nutrition components of a program: Demonstrate knowledge of facility management to include evaluation, maintenance, security, and meeting applicable codes; Demonstrate knowledge of planning for appropriate indoor and outdoor environments; Identify ways to support early childhood educators in the selection of appropriate materials and equipment for the environment; Demonstrate knowledge of the impact of the environment on children's learning and development.
2. Demonstrate knowledge of early care and education curriculum that is individually, culturally, linguistically, and developmentally responsive: Describe a variety of curriculum goals and teaching strategies; Describe the importance of ongoing curriculum assessment and planning, and collaboration with teachers, families and community entities; Identify ways to support early childhood educators in curriculum assessment and planning.
3. Demonstrate knowledge of family/community involvement in effective program development: Describe the importance of supporting families as partners in early care and education program development; Describe both informal and formal communication systems with families that encourage information sharing and joint decision making; Identify strategies for resolving conflicts and supporting families with diverse backgrounds and parenting expectations; Identify the range of family needs including transitional periods; Identify within the community the network to support families with their special needs; Describe a "family friendly" inclusive philosophy
4. Demonstrate knowledge of a director's role as an educational leader in an inclusive setting: Describe what a director does in supporting the instructional component of the program for children, staff, and families; Identify resources that a director might use to keep current with information relating to the instructional component of the program; Describe ways to involve teachers in instructional decision making.

ECED 2215. Program Management

3 Credits (3)

This course emphasizes the technical knowledge necessary to develop and maintain an effective early care and education program. It focuses on sound financial management and vision, the laws and legal issues that affect programs, and state and national standards such as accreditation. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Develop a comprehensive program philosophy.
2. Demonstrate the ability to develop systems that are effective for quality program operation.
3. Create a program budget and understand the Income and Expense sides and what affects each part.
4. Model best practices that integrate various leadership styles.

ECED 2280. Professional Relationships**3 Credits (3)**

This course addresses staff relations that will foster diverse professional relationships with families, communities and boards. Topics of staff recruitment, retention, support and supervision will lay the foundation for positive personnel, family and community relationships. Consent of instructor required. May be repeated up to 3 credits.

Corequisite: ECED 2281.

Learning Outcomes

1. Interview an administrator and write a paper describing personnel management, staff support, supervision, and professional development.
2. Identify and describe ethical and legal requirements in maintaining a professional relationship with subordinates, the community, clients, and fellow administrators.
3. Identify and describe technologies which may be used in an early childhood setting.
4. Identify and describe legal and ethical considerations in the employment of others.

ECED 2281. Professional Relationships Practicum**2 Credits (2)**

Practical experience in the development of staff relationship that will foster professional relationships with families, communities and boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Consent of instructor required. Restricted to ECED majors.

Corequisite(s): ECED 2280.

Learning Outcomes

1. Demonstrate knowledge of personnel management, staff support, supervision, and professional development within a diverse and inclusive organization: Describe methods for recruiting and retaining a diverse staff; Describe job descriptions for each position; Review a sampling of personnel policies and procedures; Review a variety of staff handbooks; Explain why on-going system of supervision should include regular meetings for professional goal setting, self-assessment, and feedback; Review program needs to effectively manage the work of the program including scheduling, covering ratios, initial orientation, in-service, staff meeting, etc.
2. Demonstrate an awareness of appropriate communication and collaboration skills: Improve written and oral communication skills; Describe strategies for resolving conflicts; Explain how to promote consensus building as a decision making process.
3. Demonstrate knowledge that promotes effective professional relationships with families, communities, and board members: Describe methods for demonstrating respect, understanding, and appreciation for all people; Identify the aspects of culture that facilitate relationship building among people; Describe how to build a common vision and develop long range program plans with parents, staff, board, and the community; Communicate program goals to visitors, prospective parents, volunteers, and board members; Describe how public relations and marketing strategies can impact programs; Review assessment tools that identify needs for early care, education and family support; Develop a personal professional development plan; Describe methods to work effectively with a board and advisory group.
4. Demonstrate knowledge of technology uses and skill acquisition: Describe how to use technology resources to engage in ongoing professional development and lifelong learning; Describe how you will use technology to communicate and collaborate in your leadership role

ECED 3110. Research in Child, Growth, Development and Learning 3 Credits (3)

This advanced course in child growth, development, and learning builds upon the foundational material covered in the basic course in child growth, development, and learning. An integration of major theories of child development is provided by focusing on contemporary research in all aspects of development, including bio-ecological, social-affective, cognitive, language, and the methodological aspects of research in early childhood development and education. Restricted to ECED majors (TEP and Zero-to-Four) and ECED minors. May be repeated up to 3 credits.

Prerequisite: ECED 1110;.

Learning Outcomes

1. Incorporate understanding of developmental stages, processes and theories of growth, development, and learning into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child

ECED 3120. Family, Language, and Culture 3 Credits (3)

This course analyzes the interrelationships between family, language, and culture as connected to children's development and learning. In this course, language is understood as a human activity and higher mental process which build on the children's families, community, and cultural background. Restricted to: ECED majors (TEP and Zero-to-Four) and ECED minors. May be repeated up to 3 credits.

Prerequisite: ECED 1130.

Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society. A.6
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.7

ECED 3210. Emergent Literacy 3 Credits (3)

This advanced course is designed to prepare early childhood professionals to study literacy development, specifically oral language, writing and reading. This course focuses on children from birth through age 4, including children with special needs. Through a developmental approach, the course addresses: 1) recent theory and research that translates into practical strategies, assessment materials and preparation of rich literacy environments, 2) the socio-cultural contexts in which children develop literacy, 3) culturally, linguistically and developmentally appropriate literacy curricula, 4) processes used to determine the appropriateness of various literacy strategies, 5) assessment, evaluation, and accountability and 5) literacy leadership. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.

Prerequisite: ECED 2115.

Learning Outcomes

1. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A. eight
2. Knowledge of how children acquire and use verbal, non-verbal and alternative means of communication. A. nine
3. Develop partnerships with family members to promote early literacy in the home. C. eight
4. Establish partnerships with community members in promoting literacy. C.ten
5. Knowledge of the language, reading and writing components of emergent literacy at each developmental level. D. four
6. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E. nine
7. Use a variety of language strategies during adult-child and child-child interactions and facilitate dialogue of expressive language and thought. E. ten
8. A variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E. eleven
9. Demonstrate and facilitate conceptual understanding of family roles in the development of their infant and toddler, including support for family acquisition of knowledge concerning infant and toddler's growth, learning and development and cultural and linguistic diversity represented within the home setting. H. one 1
10. Apply theoretical knowledge f and ability to provide screening and assessment unique for infants and toddlers. H. two 1
11. Articulate and demonstrate conceptual understanding of respectful, responsive, and reciprocal interactions that serve as basis for infant/toddler curriculum and learning environments. H. five 1
12. An understanding and applications of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I. three 1
13. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills. I. five 1
14. Establish priorities for high-quality and meaningful language and pre-literacy experiences across the developmental continuum, using language, pre-reading and pre-writing to facilitate skill development while strengthening children's cultural identity. I. eleven 1
15. Knowledge of second- language acquisition and bilingualism including the diversity of home language environments. I. twelve
Conceptual knowledge of the principles and standards derived from professional organizations for curriculum decision- making. I. fifteen

ECED 3996. Special Topics**1-3 Credits (1-3)**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

ECED 4110. Young Children with Diverse Abilities**3 Credits (3)**

Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 5110. Restricted to ECED majors (TEP and Zero-to-Four) and ECED Minors. May be repeated up to 3 credits.

Prerequisite: SPED 3105.

Corequisite: ECED 4120.

Learning Outcomes

1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities.

ECED 4120. Assessment of Young Children, Birth-Eight**3 Credits (3)**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Restricted to ECED Majors (TEP and Zero-to-Four) and ECED Minors. May be repeated up to 3 credits.

Prerequisite: SPED 3105.

Corequisite: ECED 4110.

Learning Outcomes

1. Understand the technical aspects of early childhood assessments
2. Conduct and utilize assessments
3. Collaborate with other professionals

ECED 4210. Integrated Early Childhood Curriculum**4 Credits (4)**

This advanced course focuses on developmentally appropriate content, learning environments, and curriculum implementation for children birth through age 4. It emphasizes integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to: Zero-to-Four majors. May be repeated up to 4 credits.

Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, and ECED 1120.

Corequisite: ECED 4211.

Learning Outcomes

1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four

ECED 4211. Integrated Curriculum Practicum**2 Credits (2)**

The advanced practicum course is a field based course that will provide opportunities for the integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to Zero-to-Four majors. May be repeated up to 2 credits.

Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, ECED 1120.

Corequisite: ECED 4210.

Learning Outcomes

1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
3. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
4. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight
5. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I.three

ECED 4220. Advanced Caregiving for Infants and Toddlers**3 Credits (3)**

The advanced field-based course is intended to assist students to define and implement advanced elements of quality programming for all infants, toddlers in safe, healthy, responsive caring environments. The experiences in the approved setting will support strong nurturing relationships, cultural competence, diverse learning needs and styles of every child, appropriate guidance techniques and partnership with the families, cultures, and community represented. Students are assisted through the course in advancing their ability to observe, discuss, and implement elements of quality programming for infants and toddlers in home, small-group or whole-group care situations. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.

Prerequisite: ECED 2120 and ECED 2121; ECED 2130 and ECED 2131.

Learning Outcomes

1. The primary goal of your participation in this course is to develop an increased understanding of infant/toddler (Birth through age three) development and developmentally appropriate care/education practices.

ECED 4250. Teaching and Learning Math and Science**4 Credits (4)**

Standards, principles, and practices in teaching mathematics and science to young children in preschool through grade 3. An emphasis is placed on developing a content-rich integrated math and science curriculum that focuses on children's development and interests, includes appropriate content, processes, environment, and materials with an emphasis on problem-solving as the major means of constructing basic concepts. Field experience required. Restricted to: TEP-ECED majors. May be repeated up to 4 credits.

Corequisite: ECED 4310, ECED 4260, ECED 4320.

Learning Outcomes

1. The arithmetic of real numbers and their subsets of rational numbers, integers, and whole numbers including a large repertoire of interpretations of the four basic operations and ways they can be applied, and an understanding of place value and its implications for ordering numbers and estimation. H.two.a.i
2. Three dimensional geometry based on the concept of distance, and two dimensional geometry as a method of drawing plans and representing three dimensional objects H.two.a.ii
3. Measurement of length, perimeter, area, time, weights, and temperature H.two.a.iii
4. Handling money problems such as cost and unit price. H two.a.iv
5. Demonstrate understanding and skill in the constructions of solids, measurements of their volumes and surface areas, drawing their projections, and making plans for their construction; defining relevant variables and writing formulas describing their relationships in problem-solving activities; and using measurement tools and appropriate techniques for recording data and displaying results. H two.b
6. Facilitate curriculum with open-ended activities that promote children's expansion of the material learned, and in which children learn to use a variety of mathematical skills and concepts, including problem solving, reasoning, and logic. H.two.c
7. Provide opportunities for children to learn how to use tools, technology, and manipulatives in problem solving. H two.d
8. Establish a classroom environment of respect for cultural diversity and gender equity in which all children develop skills in communicating, discussing, and displaying mathematical ideas. H two.e
9. Demonstrate understanding and apply the fundamental concepts in the subject matter of science including physical, life, and earth and space sciences as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry process scientists use in discovery of new knowledge to build a base for scientific inquiry. H two.a 1
10. Apply the scientific method to develop children's abilities to identify and communicate a problem, and to design, implement, and evaluate a solution. H three.b 1
11. Demonstrate the ability to integrate a variety of technologies into planned science activities. H three.c 1
12. Establish a classroom environment of respect for cultural diversity and gender equity where all children participate fully in science learning. H three.d Support play in young children's learning and development from age Pre-K-grade three. I.six 1
13. Demonstrate sound knowledge and skills in using technology as a teaching and learning tool. I.seven 1
14. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards. I.nine 1
15. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for

ECED 4260. Teaching and Learning Social Studies, Fine Arts and Movement**3 Credits (3)**

The course focuses on the aims, scope, and integration of methods of teaching social studies, the fine arts and movement across the curriculum. This course emphasizes an integrated approach to teaching the what and why of social studies; assessing student learning; planning units, lessons, and activities; effective instructional strategies; and knowledge of social studies content. Concepts of expressive art include the visual arts, music, movement and drama. Restricted to: TEP-ECED majors. May be repeated up to 3 credits.

Corequisites: ECED 4310, ECED 4250, ECED 4320.

Learning Outcomes

1. Demonstrate an understanding of the principles of teaching and learning processes that underscore social studies concepts and can translate these into meaningful learning activities focusing on inquiry, authenticity, and collaboration. H.four.a
2. Demonstrate understanding that social studies encompass history, geography, anthropology, archeology, economics, political science, psychology, sociology, and the interdisciplinary relationship of all facets of social studies. H.four.b
3. Demonstrate understanding that the definition of social studies requires that children be socially aware of and are active participants in local, state, national, and global issues; and that children recognize and respect diverse local and global perspectives concerning cultures other than their own. H.four.c
4. Implement a variety of teaching strategies to assist children to use multiple resources including primary (e.g., documents, artifacts/regalia, direct observation, human resources, personal background) and secondary (e.g., books, newspapers, internet) as part of the inquiry/research process. H.four.d
5. Create curriculum experiences that provide opportunities for children to appreciate the historical development of democratic values, institutions, nations, and cultures. H.four.e
6. Demonstrate the ability to plan for and engage children in activities that require them to formulate, analyze, synthesize, and critique issues by using well-reasoned, clearly supported arguments, policies, and positions. H.four.f
7. Demonstrate the ability to plan for and engage children in the presentation of social studies knowledge using a variety of sign systems including writing, charts, graphs, maps, art, music, drama, dance, and technology. H.four.g
8. Demonstrate an understanding and implementation of arts activities such as history, art making, appreciation, and criticism through dance, music, theater, and the visual arts, appropriate to young children's developmental levels interests. H.five.
9. Demonstrate knowledge of the distinctions, connections, and integration between arts disciplines and arts experiences and encourages study and active participation that leads to skill development and appreciation. H.five.b 1
10. Facilitate curriculum in which children communicate at a basic level in the four (4) art disciplines of dance, music, theater, and visual arts, including knowledge and skills in the use of basic vocabularies, materials, tools, techniques, and thinking processes of each discipline. H.five.c 1
11. Create a classroom environment with exemplary works of art from a variety of cultures and historical periods and provide opportunities for students to discuss and respond to them. H.five.d 1
12. Demonstrate an understanding of motor skill development in young children and apply knowledge of age and developmentally appropriate psychomotor and cognitive activities. H.five.e 1
13. Create and use appropriate instructional cues and prompts for motor skills, rhythms, and physical activity. H.five.f 1

ECED 4310. Early Primary Field Placement**2 Credits (4P)**

The field practicum is a co-requisite course with Teaching and Learning Reading and Writing; Teaching and Learning Math and Science; Teaching and Learning Social Studies, Fine Arts and Movement. The field based component will provide experiences that address curriculum content and practice teaching that is relevant for early primary children in developmentally and culturally sensitive ways. Graded: S/U Grading (S/U, Audit). Restricted to: TEP-ECED majors. May be repeated up to 2 credits.

Corequisite: ECED 4250, ECED 4260, ECED 4320.

Learning Outcomes

1. Demonstrate the ability to work collaboratively with educational assistants, volunteers, and others to individualize the curriculum and to meet program goals.
2. Demonstrate skill in collaboration with professionals from other disciplines (e.g., mental health, psychology, speech and language) when planning curriculum and teaching strategies for young children with diverse abilities.
3. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to an adult-directed and from free exploration to scaffolded support or teacher modeling.
4. Apply an understanding of young children's need for balance, order, depth, variety, and challenge through curriculum planning, routines, and scheduling (e.g., daily, weekly, and longer-term).
5. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills.
6. Apply knowledge to create environments that enrich and extend children's play including intervention strategies (i.e., questioning), respect of cultural diversity and gender equity. Support play in young children's learning and development from age Pre-K - grade three.
7. Demonstrate the ability to promote positive social interactions and engage children in learning activities while actively working to increase social and emotional competence of all children.
8. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards.
9. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
10. Demonstrate conceptual knowledge of the principles and standards derived from professional content organizations (zero to three, NAEYC, DEC) for curriculum-decision making. Demonstrate the use of reflective practice.

ECED 4320. Teaching and Learning Reading and Writing**3 Credits (3)**

The foundation of this course is on understanding the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature. Restricted to: TEP-ECED majors. May be repeated up to 3 credits.

Prerequisite: ECED 2115.

Corequisite: ECED 4310, ECED 4250, ECED 4260.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? ; Is that different from literacy outside of school?; How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 4810. Student Teaching/Seminar Early Childhood**3 Credits (3)**

Discussion of early childhood school issues related to student teaching. May be repeated up to 3 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

ECED 4996. Topics**3 Credits (3)**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

ECED 4998. Field Experience (Infants Pre-K)**1 Credit (1)**

Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. May be repeated up to 1 credit.

Learning Outcomes

1. Engage in an ECED field experience.

ECED 5110. Working with Young Children with Special Needs, Ages 3-8**3 Credits (3)**

Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 4110 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities. A.three
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities. A.four
4. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
5. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
6. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
7. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
8. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions, family structures, relationships, stressors, and supports (including the impact of having a child with diverse abilities), home language, and ethnicity. C.twelve
9. Adapt content to meet the needs of each child, including the development of individualized family service programs (IFSP) or individualized education programs (IEP) for children with diverse abilities through the team process with families and other team members. D.six 1
10. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two 1
11. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.twelve 1
13. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguards confidentiality and privacy. F.two 1
14. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for individual family service programs (IFSP) and individual service programs (IEP). F.three 1
15. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional standards. It is collaborative and open with the goal of supporting diverse children and families. F.eight 1
16. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
17. Demonstrate ability to work collaboratively as an advocate with families and IFSP and IEP team members to provide developmentally supportive environments. H.three 1
18. Demonstrate content knowledge (e.g., art, music, movement, science,

**ECED 5120. Assessment of Young Children, Birth Eight
3 Credits (3)**

Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as ECED 4120. May be repeated up to 3 credits.

Prerequisite: ECED 5110 or consent of instructor.

Learning Outcomes

1. UNDERSTAND THE TECHNICAL ASPECTS OF EARLY CHILDHOOD ASSESSMENTS -Define and understand the benefits and concerns of assessment, types of assessment, and best practices for early childhood assessments and their targeted populations.
2. CONDUCT AND UTILIZE ASSESSMENTS- Demonstrate proficiency in using a variety of assessment tools to: screen children; assess current skill levels; determine strengths and weaknesses; supplement assessments when warranted; and incorporate data for instructional plans.
3. COLLABORATE WITH OTHER PROFESSIONALS – Utilize transdisciplinary practices with all vested participants when conducting screenings, evaluations, and making recommendations.
4. COLLABORATE WITH FAMILIES- Demonstrate proficiency in obtaining information from parents about their expectations, needs, and priorities when assessing and making early childhood instructional recommendations.
5. EVALUATE PROGRAMS- Implement best practices in program design, advocate for children's services, and articulate/safeguard student IFSP/IEPs according to each child's developmental needs.

**ECED 5130. Working with Parents of Young Children
3 Credits (3)**

Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a deep understanding of the theory, philosophy and goals of multicultural education
2. Develop a knowledge base of the essential concepts to address language, culture, class, gender, and exceptionalities within the theoretical constructs of multicultural education.
3. Develop a personal and social astuteness to the characteristics of culturally, linguistically, and ethnically distinct students while keeping in mind the uniqueness of their persona within a contextually rich school and community milieu.
4. Explore multicultural education strategies that well enhance one's future pedagogical repertoire.
5. Provide learning opportunities to develop multicultural and cross-cultural perspectives for application into future learning environments.
6. Develop an active sense of commitment to collaborative efforts in order to best meet our goals as committed learners and educators who will teach with and facilitate multicultural curriculum in a variety of pluralistic settings.
7. Develop an array of perspective skills in order to accommodate the dynamics of culture change, pluralism, cultural sensitivity, and cultural democracy that occur within classrooms.
8. Demonstrate growth in the dispositions identified in the "Teacher Candidate Disposition" document.

**ECED 5210. Leadership and Advocacy in Early Childhood
3 Credits (3)**

The course explores a multidisciplinary approach to early childhood educational leadership, advocacy and change. The course focuses on leadership in its many forms: in teaching, administration, policy, research, and ethics. In addition, we will examine the theory and practice of change to gain an understanding of what contributes to advocating for policy and community change. Students will gain a deeper understanding of themselves as leaders, and ways to improve early education to promote social justice in programs and systems serving families and young children. May be repeated up to 3 credits.

Learning Outcomes

1. Examine and evaluate a multidisciplinary approach to early childhood educational leadership.
2. Examine leadership in its many forms: in teaching, administration, policy, research, and ethics.
3. Utilize theory and practice of advocacy leadership for policy and community change.
4. Develop a statement of leadership philosophy.

**ECED 5220. Play in the Early Childhood Curriculum
3 Credits (3)**

Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of play stages, development, and theories of play in early childhood education into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the different types of play (sociodramatic, constructive, rough tumble, games with rule) and their uses in classrooms to promote learning. (I.B)
3. Demonstrate knowledge of the significance of guiding young children's play to enhance learning in early childhood classrooms. (I.C)
4. Demonstrate knowledge of social influences on play and young children's development of gender identity. Provide and use anti-bias materials and experiences in all areas of the curriculum. (I.D)
5. Provide a variety of play activities that facilitate development of the whole child in all areas, physical/motor, social/emotional, language/cognitive and adaptive/living skills. (I.E)
6. Apply knowledge of cultural and play diversity and the significance of socio-cultural political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society. (I.F)
7. Demonstrate knowledge of the many functions play serves in the cognitive, social, and emotional aspects of development in the formative years.
8. Develop and demonstrate skills in selecting quality play activities for young children. (I.G)
9. Demonstrate knowledge of the developmental sequences of play development, including the influence of culture and home factors. (I.H) 1
10. Demonstrate knowledge of how young children acquire and use technology play to promote learning. (I.I) 1
11. Demonstrate knowledge of how play is used to support standards and assessment in early childhood education. (I.J)

ECED 5230. Curriculum in Early Childhood Education**3 Credits (3)**

Development and implementation of curriculum and materials for teaching young children. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement appropriate ECED curriculum.

ECED 5310. Issues in Early Childhood Education**3 Credits (3)**

Examines current trends and problems through readings of theoretical, empirical, and applied literature. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the foundations of literacy development in early childhood.
2. Analyze sociocultural and critical perspectives in early literacy research, theory, and practice.
3. Apply grounded perspectives on topical issues in literacy development in early childhood.
4. Evaluate the literacies embedded in your own teaching/learning and the ones embedded in the communities in which they work.
5. Create sound theoretical and methodological frameworks in an early literacy project. Identify and use various genres in children's literature.

ECED 5410. Seminar on Child Development, Assessment and Well-being of Young Children**3 Credits (3)**

This course will reintroduce you to the world of young children in a variety of early childhood settings. It focuses on early childhood development, observation of young children and evaluation of classrooms, child well-being, and the many ways in which young children learn. Sessions will bridge theory to practice as we explore your internship experiences and gain deeper understanding of your role as an early care and education professional. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of developmental stages, process, and theories of growth, development, and learning into developmentally appropriate practice.
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with special needs.
4. Provide a variety of activities that facilitate development of the whole child in the following areas: physical/motor, social/emotional, language/cognitive, and adaptive/living skills. (I.E)
5. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. (I.G)
6. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. (I.H)
7. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
8. Demonstrate ability to adhere to early childhood education professional codes of ethical conduct and issues of confidentiality. G.one
9. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two 1
10. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four 1
11. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven 1
12. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially, and emotionally). B.two 1
13. Use appropriate health appraisal and management procedures and make referrals when necessary. B.three 1
14. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five 1
15. Implement health care and educational activities for children and families based on health and nutritional information that is responsive to diverse cultures. B.seven

ECED 5420. Science/Math Curriculum**3 Credits (2+2P)**

Methods and materials for developmentally appropriate practices in teaching science and math for young children. May be repeated up to 3 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - third grade educational settings.

ECED 5510. Advanced Teaching and Learning of Literacy**3 Credits (3)**

This advanced graduate early literacy course reviews the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5520. Literacy Development in Early Childhood**3 Credits (3)**

Advanced theory, research, and practice relating to early childhood reading. May be repeated up to 3 credits.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
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ECED 5810. Student Teaching/Seminar**3 Credits (3)**

Provides student teaching experience in a variety of settings with young children ages birth 8. Restricted to: TEP-ECED majors. Students must be Admitted into student teaching to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

ECED 6110. History and Philosophy of Early Childhood Education **3 Credits (3)**

Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the historical figures in early childhood education that have influenced current practices and discourses.
2. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development.
3. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

ECED 6996. Selected Topics in Early Childhood Education

1-6 Credits (1-6)

Offered under various subtitles. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

ECON-ECONOMICS

ECON 1110G. Survey of Economics

3 Credits (3)

This course will develop students' economics literacy and teaches students how economics relates to the everyday life of individuals, businesses and society in general. The course will also introduce students to the roles different levels of governments play in influencing the economy. At the conclusion of the course, students will be able to identify economic causes for various political and social problems at national and international levels, and have a better understanding of everyday economic issues that are reported in media and public forums.

Learning Outcomes

1. Gain and demonstrate a contextual understanding of economic terms and concepts.
2. Recognize and analyze common economic issues which relate to individual markets and the aggregate economy.
3. Learn basic economic principles that influence global trading and challenges relating to globalization.
4. Outline the implications of various economic policies on individuals and on economies.
5. Demonstrate ability to use diagrams and graphs to explain economic principles, policies and their applications.
6. Appreciate and understand how individual decisions and actions, as a member of society, affect economies locally, nationally and internationally.
7. Explain the roles of governments in influencing buyer and seller behavior in the market and how government failure occurs when intervention fails to improve or actually worsens economic outcomes.
8. Be able to apply course concepts to interpret, evaluate and think critically about economic events and policies, especially as regularly reported in the media and other public forums.

ECON 2110G. Macroeconomic Principles

3 Credits (3)

Macroeconomics is the study of national and global economies. Topics include output, unemployment and inflation; and how they are affected by financial systems, fiscal and monetary policies.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2110H. Principles of Macroeconomics Honors

3 Credits (3)

Macroeconomic theory and public policy designed: national income concepts, unemployment, inflation, economic growth and international payment problems. Must be a Crimson Scholar.

Prerequisite(s): MATH 1220G.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2120G. Microeconomics Principles**3 Credits (3)**

This course will provide a broad overview of microeconomics. Microeconomics is the study of issues specific to households, firms, or industries with an emphasis on the role of markets. Topics discussed will include household and firm behavior, demand and supply, government intervention, market structures, and the efficient allocation of resources.

Learning Outcomes

1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 2120H. Principles of Microeconomics Honors**3 Credits (3)**

Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions. Must be a Crimson Scholar.

Prerequisite(s): MATH 1220G.

Learning Outcomes

1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 304. Money and Banking**3 Credits (3)**

Income measurement and determination, monetary and fiscal policies.

Prerequisite(s): ECON 2110G or ECON 2110H or equivalent.

ECON 311. Intermediate Macroeconomic Theory**3 Credits (3)**

Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.

Prerequisite: ECON 2110G or ECON 2110H.

Learning Outcomes

1. Learn the uses and abuses of macroeconomic data
2. Learn the role of economic theory in understanding economic issues and forecasting economic behavior
3. Learn the causes and consequences of short-run economic fluctuations and long-run economic growth
4. Learn the role of government in the macroeconomy
5. By the end of the class, you should be able to describe the state of the macroeconomy and analyze the consequences of economic policy actions from several perspectives

ECON 312. Intermediate Microeconomic Theory**3 Credits (3)**

Contemporary economic theory with emphasis upon value and distribution.

Prerequisite: ECON 2120G or ECON 2120H or equivalent.

Learning Outcomes

1. Gain an understanding of the language of Intermediate Microeconomics.
2. Know the underlying structure of economic models such as supply and demand, consumer theory, producer theory and market structure.
3. Understand the assumptions of economic models.
4. Be able to solve a supply and demand model.
5. Demonstrate critical thinking skills by applying economic models to a wide variety of policy questions.

ECON 324V. Developing Nations**3 Credits (3)**

Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

ECON 325V. Economic Development of Latin America**3 Credits (3)**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the essential components for economic growth and development
2. Understand how Latin America fell behind other regions in terms of economic development
3. Compare various policies implemented to support economic development in the region, as well as the successes and failures of these policies
4. Gain a basic understanding of how to conduct independent research

ECON 332. Public Finance**3 Credits (3)**

This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 2120G or ECON 2120H

ECON 335V. Business and Government**3 Credits (3)**

Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGMT 335G

ECON 337V. Natural Resource Economics**3 Credits (3)**

Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as AEEC 337V.

Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

ECON 345. Energy Economics**3 Credits (3)**

Examines the economics of energy production including oil, coal, natural gas, renewables, and conservation as a substitute for energy production. Emphasis is on federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.

Prerequisite(s): (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

ECON 384V. Water Resource Economics**3 Credits (3)**

Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AEEC 384V.

Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

ECON 404. Collegiate Advisory Board, Federal Reserve**3 Credits (3)**

Students serve on the Collegiate Advisory Board of the El Paso branch of the Federal Reserve Bank of Dallas. Guest speakers provide an overview of the Federal Reserve System, role of monetary policy, and issues facing specific industries in the local, national, and global economies. Students prepare reports, including a final paper, on an assigned industry in the regional or state economy and the current economic performance of their industry. Students must be of junior rank or higher with a GPA of at least 3.5. Consent of Instructor required.

ECON 405. Introductory Econometrics**3 Credits (3)**

Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.

Prerequisite: MATH 1350G or A ST 311 (or equivalent).

Learning Outcomes

1. Demonstrate knowledge of probability and statistics and basic expected value theory.
2. Define the relationship between population statistics and sample statistics.
3. Explain the method of ordinary least squares.
4. Understand multiple regression, correlation, inference techniques, and significance tests.
5. Interpret basic econometric results.

ECON 432V. Economics of Health Care**3 Credits (3)**

Analysis of the allocation of resources in the field of health and medical care.

ECON 445. Oil and Natural Gas Economics**3 Credits (3)**

Examines the economics of oil and gas production. Topics covered include transportation, refining, federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.

Prerequisite: (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

Learning Outcomes

1. Oil and Natural Gas Production
2. Oil and Natural Gas Transportation and Storage
3. Advanced oil and gas market analysis
4. Economic analysis of government energy policy and regulation

ECON 449. Open Economy Macroeconomics**3 Credits (3)**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.

Prerequisite(s): BFIN 341 OR ECON 311.

ECON 450. International Economics**3 Credits (3)**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450

Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

ECON 457. Mathematical Economics**3 Credits (3)**

Application of mathematical tools, especially the calculus, to economic theory.

Prerequisite(s): MATH 1430G or equivalent.

ECON 471. Electricity Economics**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric Industry. Topics include characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Crosslisted with: ECON 571.

Prerequisite(s): ECON 345.

ECON 489. Senior Economics Seminar**3 Credits (3)**

Seminar primarily for economics majors in their final semester. Provides an opportunity to apply economic theory to a broad variety of topics.

Prerequisite(s): ECON 311 or ECON 312.

ECON 490. Selected Topics**1-3 Credits**

Current topics in economics. Subject matter to be designated for each semester.

ECON 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.

Prerequisite: junior or above standing and consent of instructor.

ECON 503. Managerial Economics**3 Credits (3)**

Theory and application of microeconomics to the management of organizations.

Prerequisite(s): MATH 1350G or A ST 311 or equivalent with B or better.

ECON 545. Econometrics II**3 Credits (3)**

Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

Prerequisite(s): ECON 457 and AEEC 540.

ECON 550. Special Topics**1-3 Credits**

Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

ECON 571. Regulatory Policy and Industry Analysis: Electricity I**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas**3 Credits (3)**

Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

ECON 573. Regulatory Policy and Industry Analysis: Electricity II**3 Credits (3)**

Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.

Prerequisite(s): ECON 571 or consent of instructor.

ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis**3 Credits (3)**

Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.

Prerequisite(s): ECON 571 or consent of instructor.

ECON 582. Economics of Health Care**3 Credits (3)**

Analysis of the allocation of resources in the field of health and medical care. Taught with ECON 432V with differentiated assignments for graduate students.

ECON 596. Independent Study**3 Credits (3)**

Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

EDLT-EDUCATIONAL TECHNOLOGY

EDLT 2110. Integrating Technology with Teaching**3 Credits (3)**

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

Prerequisite: ENGL 1110G.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-12 schools and apply that knowledge into future practice.

EDLT 3110. Integrating Technology with Teaching**3 Credits (3)**

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-Twelve schools and apply that knowledge into future practice.

EDLT 5110. Foundations of Learning Design & Technology**3 Credits (3)**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process. Conduct a needs assessment.
3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 5120. Critical Digital Literacy**3 Credits (3)**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. May be repeated up to 3 credits.

Learning Outcomes

1. Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

EDLT 5130. Technology and Language Learning**3 Credits (3)**

Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Considers use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments

EDLT 5140. Fostering Online Learning Communities**3 Credits (3)**

Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.

Learning Outcomes

1. Examine theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.

EDLT 5210. Social Media in Blended and Online Learning Environments**3 Credits (3)**

This course will explore the role of social media in online and blended learning environments through practical hands-on activities, critical dialogue, and collaborative projects which will prepare you to utilize social media personally and pedagogically. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and give examples of social media for use in your blended and online learning environments.
2. Actively engage, communicate and collaborate using social media, both inside the classroom and in appropriate social media-based learning environments.
3. Evaluate, analyze, and synthesize readings, research, and other information about social media in education.
4. Access, utilize, design, evaluate, and assess learning activities using social media.

EDLT 5220. Culturally Responsive Teaching with Technology**3 Credits (3)**

Use of inquiry and problem-based learning supported by computer-based applications. Critical analysis of multiple forms of electronic media. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in culturally responsive teaching with technology.

EDLT 5230. Designing and Organizing Online Learning Environments**3 Credits (3)**

Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.

Learning Outcomes

1. Design and organize effective online learning.

EDLT 5240. Online Teaching and Learning**3 Credits (3)**

This course provides a survey of theories, models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an awareness of equity social justice issues related to online education.
2. Critique and reflect upon diverse design frameworks,
3. Develop online resources for use in your professional and personal educational pursuits,
4. Explore and participate in the use of emerging technologies for online education.
5. Identify and discuss the impact of different technological innovations on society with particular emphasis on education,
6. Analyze and evaluate the use of technologies for teaching and learning in culturally relevant and responsive ways.

EDLT 5250. Tools and Techniques for Online Teaching**3 Credits (3)**

Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience. May be repeated up to 3 credits.

Learning Outcomes

1. Implement effective online teaching.

EDLT 5310. Design and Delivery of Webconferences and Webinars**3 Credits (3)**

This course provides hands-on experiences with web conferencing and examines the theory and research of webconferencing's impact on teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate the skillful use of the technology tools for a synchronous webconferencing system.
2. Evaluate best practices of interaction and engagement in the design and delivery webconferencing events.
3. Develop a variety of webconferencing strategies to engage and manage webconferencing attendees.
4. Design, develop, and implement the delivery of a web conference, first with a partner or team and individually by the end of the course.
5. Use self- and peer-evaluation for continuous improvement of web conferencing sessions.

EDLT 5320. Universal Design in Online Course Design**3 Credits (3)**

Examines theory, practical application of strategies, and global and policy implications of universal design (UD) in online learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement universal design.

EDLT 5330. Emerging Technology Tools and Techniques**3 Credits (3)**

This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Implement effective techniques.

EDLT 5992. Directed Study**3 Credits (3)**

Supervised academic work. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of an EDLT topic.

EDLT 5999. Capstone**3 Credits (3)**

The capstone course provides an opportunity to demonstrate teaching and learning in blended and fully online environments. Demonstrate competencies with best practices in culturally responsive teaching, learning/educational technology, online pedagogy, portfolio creation, and curriculum development for blended and online delivery using emerging technologies. May be repeated up to 3 credits.

Learning Outcomes

1. Apply teaching and learning standards to review blended or online courses for learning environments.
2. Demonstrate proficiency using the tools of learning management systems.
3. Apply best practices in instructional design for blended/online courses
4. Explain how research and practice inform your course instructional design decisions.
5. Create a blended or online learning course that meets online teaching standards
6. Demonstrate participation in an online learning community.

EDLT 6110. Foundations of Learning Design & Technology**3 Credits (3)**

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Includes a theoretical and research component for doctoral students.

May be repeated up to 3 credits.

Learning Outcomes

1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process. Conduct a needs assessment.
3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 6120. Emerging Models for Learning Design & Technology**3 Credits (3)**

Integration of technology into content areas. May be repeated up to 3 credits.

Learning Outcomes

1. Understand emerging EDLT models.

EDLT 6210. Current Research in Learning and Technology**3 Credits (3)**

Explores models and methods for examining and researching the impact of technology on learning and education. May be repeated up to 3 credits.

Learning Outcomes

1. Understand current technology research.

EDLT 6220. Multimedia, Authoring and Curriculum Design**3 Credits (3)**

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Includes additional theoretical research component for doctoral students. May be repeated up to 3 credits.

Learning Outcomes

1. Facilitate effective technology learning environments.

EDLT 6230. Technology, Society, and Education**3 Credits (3)**

Investigates models of the change process, examines speculations related to the directions and dynamics of change in an era of electronic technologies, explores shifts in the cultural and personal activities and relations of humans, and speculates on concomitant educational implications. May be repeated up to 3 credits.

Learning Outcomes

1. Understand technology and pedagogy.

EDLT 6240. Online Teaching and Learning**3 Credits (3)**

This course provides a survey of theories; models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. Topics covered include accreditation, assessment, culturally responsive course design, current trends and best practices, hybrid and blended learning, learning management systems, online support services, social justice issues in online education, learner engagement, and retention.

Learning Outcomes

1. Implement effective digital pedagogy.

EDLT 6998. Advanced Fieldwork**3 Credits (3)**

Fieldwork in learning technologies provides opportunities to integrate theory and practice through research, teaching and/or development. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the historical figures in early childhood education that have influenced current practices and discourses. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

EDUC-EDUCATION**EDUC 1110. Freshman Orientation****1 Credit (1)**

Introduction to the university and to the College of Education. Discussion of planning for individualized education program and field experience. Restricted to Las Cruces campus only. May be repeated up to 1 credit.

Learning Outcomes

1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for teaching, reading, writing, and other academic skills in English and the native language.
2. Demonstrates knowledge of and applies management techniques appropriate to classrooms containing students who have varying levels of proficiency and academic experience in both languages.
3. Community/Family Involvement- The bilingual teacher: (a) Recognizes the importance of parental and community involvement for facilitating the learner's successful integration to his/her school environment. (b) Demonstrates knowledge of the teaching and learning patterns of the students' home environment and incorporates these into the instructional areas of program.
4. Assessment- The bilingual teacher: (a) Assesses oral and written language proficiency in academic areas in both languages utilizing the results for instructional placement, prescription, and evaluation. (b) Evaluates the growth of the learner's native and second language in the context of the curriculum. (c) Continuously assesses and adjusts her or his own language use in the classroom in order to maximize learner comprehension and verbal participation

EDUC 1120. Introduction to Education**2 Credits (2)**

Introduction to the historical, philosophical, sociological foundations of education, current trends, and issues in education; especially as it relates to a multicultural environment. Students will use those foundations to develop effective strategies related to problems, issues and responsibilities in the field of education. Restricted to Las Cruces campus only. May be repeated up to 2 credits.

Learning Outcomes

1. Describe the teaching and learning of various American education settings including early childhood, elementary, middle school, high school, and special education.
2. Describe how teachers use educational theory and the results of research of students' learning.
3. Explain the techniques for establishing a positive and supportive environment in the classroom
4. Identify and describe instructional strategies supported by current research to promote thinking skills of all learners.
5. Recognize the teachers' role and responsibilities in an increasingly diverse, multicultural society.

EDUC 1140. Math for Paraprofessionals**3 Credits (3)**

Applied math skills for paraprofessionals working with children. May be repeated up to 3 credits.

Prerequisite: CCDM 103 N.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1150. Math for Paraprofessionals II**3 Credits (3)**

Applied math skills for paraprofessionals working under the direction of a teacher. May be repeated up to 3 credits.

Prerequisite: EDUC 1140.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1185. Introduction to Secondary Education and Youth**3 Credits (3)**

Introductory course for students considering a career in secondary education. Includes historical, philosophical, and sociological foundations, program organization, critical dispositions, and understanding the context of schools and youth. Practicum required. Restricted to: Secondary Ed majors. Traditional Grading with RR.

Learning Outcomes

1. Articulate the attributes of an education professional entering the field.
2. Differentiate and summarize the major educational philosophies and historical events that have influenced the progression of educational practice.
3. Describe the role of law in education with emphasis on the rights and responsibilities of teachers and learners.
4. Develop a preliminary personal philosophy of teaching and learning.
5. Discuss the characteristics and roles of the teacher, the student, and the school in today's education.
6. Identify effective teaching methods, instructional strategies and learning styles.
7. Evaluate the Lesson Planning Process using various lesson planning templates, formats, and rubrics.
8. Explain classroom management techniques.
9. Identify different types of diversity in the classroom environment. 1
10. Describe how learning differences are manifested in schools. 1
11. Describe how teachers use multiple methods of assessment to engage learners in their own growth, to monitor learner progress 1
12. Describe how teachers use multiple methods of assessment to modify instruction and inform decision making. 1
13. Identify the role of Standards and High Stakes Testing in the life of an educational professional 1
14. Complete 24 hours internship in a classroom, preferably a bilingual classroom. 1
15. Document and reflect on your observations throughout your internship. 1
16. Construct an individualized map to teacher licensure in the State of New Mexico.

EDUC 1995. Field Experience I**1 Credit (1)**

Introduction to public school teaching, school visits, classroom observations and discussion seminar. May be repeated up to 1 credit.

Learning Outcomes

1. Demonstrate an understanding of personal attitudes and motivations for entering the field of education.
2. Identify effective teaching strategies that enhance student learning outcomes.
3. Identify classroom management techniques and learning styles.
4. Develop observational skills and reflective thinking skills.
5. Evaluate instructional methods that enhance upper level thinking skills in children.

EDUC 1996. Special Topics in Education**1 Credit (1)**

Supervised study in a specific area of interest. Each course shall be designated by a qualifying subtitle. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

EDUC 1998. Internship I**3 Credits (3)**

Supervised experience in elementary education settings. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

EDUC 2710. Pre-Teacher Preparation**3 Credits (3)**

Assists students in developing the necessary competencies needed for acceptance to the Teacher Education Program. Course content includes basic skill development, test taking skills, and completion of teacher preparation packet. May be repeated up to 6 credits.

Learning Outcomes

1. Investigate the process and requirements of the Teacher Education Program
2. Read critically about teacher's experiences and write brief reactions
3. Discuss philosophies of education and draft a written personal philosophy of education
4. Discuss the nature of education for students with diverse languages, cultures and abilities
5. Draft personal position statements concerning education for students with disabilities and diverse cultures

EDUC 2998. Internship II**3 Credits (3)**

Supervised experience in junior high settings. May be repeated up to 3 credits.

Prerequisite: must be a co-op student.

Learning Outcomes

1. Varies

EDUC 3110V. Multicultural Issues in Society**3 Credits (3)**

Conceptual manifestations of culture, race, ethnicity, class, gender, exceptionalities, language, and bilingualism within and across society. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3120. Multicultural Education**3 Credits (2+2P)**

The conceptual manifestations of culture, race and ethnicity, class, gender, sexual orientation, exceptionalities, language, bilingualism, and global citizenship within the schooling process. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3210. Sheltered English Instruction for the ESL Classroom**3 Credits (3)**

Addresses the acquisition of English proficiency by speakers of other languages. May be repeated up to 3 credits.

EDUC 3220. Language, Literacy, and Culture in the ESL Classrooms**3 Credits (3)**

Framework and strategies for developing the written abilities of second language learners. May be repeated up to 3 credits.

EDUC 3996. Special Topics in Education**1-3 Credits (1-3)**

Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 cr. per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 3997. Secondary Field Experience**3 Credits (2+2P)**

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Taught with: BLED 3110. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices in secondary education.

**EDUC 4310. Methods of Teaching Elementary School Science
3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia. Students must complete 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department. Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons;
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction;
3. Develop assessment tools to evaluate learner's science knowledge;
4. Identify and use appropriate NMSTEM Ready!State science standards for lesson planning;
5. Integrate science with all subjects;
6. Discuss the advantages and the importance of membership in national/international professional organizations(e.g. NSTA) as well as subscribing to professional journals;
7. Identify science educational resources available using a variety of technological tools to enhance learning;
8. Demonstrate competence and confidence in teaching science;
9. Demonstrate basic classroom management skills.

**EDUC 4320. Methods of Teaching Elementary School Mathematics
3 Credits (3)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades.

Prerequisite: MATH 1134.

Learning Outcomes

1. Identify what makes a 'good mathematical task', and how a good task can support students' learning;
2. Understand how children make sense of key mathematics concepts;
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving;
4. Identify your role as a teacher in a math classroom;
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching;
6. Adjust lessons and instruction based on students' needs;
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching;
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process;
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics

**EDUC 4330. Methods of Teaching Elementary School Social Studies
3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. May be repeated up to 3 credits.

Learning Outcomes

1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

**EDUC 4410. Teaching Science at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Taught with EDUC 5410.

May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

**EDUC 4420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Taught with EDUC 5420.

May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

**EDUC 4430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Taught with EDUC 5430.

May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

EDUC 4440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Taught with EDUC 5440. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

EDUC 4510. Data Literacy and Assessment

3 Credits (3)

Methods for selecting, constructing, and using multiple methods of assessment to monitor learner progress and improve student learning. Students will learn to analyze and use classroom and standardized assessment data to understand patterns and gaps in learning, to guide planning and instruction, and employ technology to support practice. May be repeated up to 6 credits.

Learning Outcomes

1. Understand and implement effective data literacy and assessment procedures.

EDUC 4520. Contemporary Issues in Education

3 Credits (2+2P)

Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. Requires field experience component in a school or community setting. May be repeated up to 3 credits.

Learning Outcomes

1. Understand important issues and practices in contemporary education.

EDUC 4530. Science for Educators

3 Credits (3)

This course will focus on the exploration of key central science concepts and how to connect learners to resources, tools of inquiry, and collaborative problem solving related to authentic local and global issues in classroom, lab, and digital science environments. Topics include: The nature of science, Physical Science, Life Science, Earth and Space Science.

Learning Outcomes

1. Understand primary science content and knowledge for K-12 classrooms.

EDUC 4810. Elementary Student Teaching

9 Credits (9)

Synthesis of knowledge and skills appropriate to teaching in elementary schools. May be repeated up to 9 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

EDUC 4811. Elementary Student Teaching Seminar

3 Credits (3)

Discussion of elementary school issues related to student teaching.

Taken concurrently with EDUC 4810. May be repeated up to 3 credits.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

EDUC 4820. Secondary Student Teaching

9 Credits (9)

Synthesis of knowledge and skills appropriate to teaching in secondary schools. May be repeated up to 9 credits.

Learning Outcomes

1. Carry out effective student teaching in a secondary classroom.

EDUC 4821. Middle and High School Student Teaching Seminar
3 Credits (3)

Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 4820. May be repeated up to 3 credits.

Learning Outcomes

1. Carry out effective student teaching in a secondary classroom.

EDUC 4992. Directed Study Courses in Education
1-3 Credits (1-3)

Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 4996. Topics
1-3 Credits (1-3)

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 5110. Exploration in Education
3 Credits (3+3P)

Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.

Learning Outcomes

1. Explore important concepts and knowledge necessary to carry out effective practices in K-12 classroom settings.

EDUC 5120. Multicultural Education
3 Credits (2+2P)

Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Taught with EDUC 3120 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the influence on learning of such social identities as race, class, sexual orientation, language, and gender.
2. Deconstruct tacit knowledges about learners and the learning process.
3. Distinguish among the structural and discursive forces that hamper particular students' educational attainment.
4. Evaluate one's own personal response to oppression in educational settings.
5. Support a pedagogical perspective and school level strategies targeted towards a more just and equitable education in your classroom.

EDUC 5130. Technology and Pedagogy
3 Credits (3)

Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities. Students must be in Graduate standing. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the relationship between curriculum and pedagogy.

EDUC 5140. Research in Curriculum and Pedagogy
3 Credits (3)

An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research. May be repeated up to 3 credits.

Learning Outcomes

1. Locate metrics useful for evaluating the quality of published research;
2. Identify the claims and supportive evidence presented in published empirical research;
3. Weigh the evidence presented in published empirical research;
4. Analyze the alignment of methods used in published empirical research with associated frameworks and research questions;
5. Synthesize a narrow body of literature in their field of interest.

EDUC 5150. Classroom Management
3 Credits (3)

Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations. May be repeated up to 3 credits.

Learning Outcomes

1. Understand effective practices in K-12 classroom management.

EDUC 5160. Curriculum and Pedagogy
3 Credits (3)

Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the historical development of standards, curriculum, and assessment in the USA;
2. Critically analyze the major influences on the historical development of standards, curriculum, and assessment;
3. Explain the positive and negative impacts these major influences have had on current standards, curriculum, and assessment;
4. Students will be able to express attainable planned actions to advocate for socially just and equitable systems within their school, district, community, and profession;
5. Construct a coherent pedagogical perspective that draws on the theories and perspectives discussed throughout the course;
6. Create a plan for a lesson that puts into action the curricular and pedagogical perspectives that place value in, and make space for, the diversity of individual social development within and between cultures.

EDUC 5170. Action Research Projects**3 Credits (3)**

Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency. May be repeated up to 3 credits.

Prerequisite: EDUC 5120, EDUC 5140.

Learning Outcomes

1. Understanding of Action Research
2. Develop an Action Research plan: Question Development; Data collection plan; Analysis
3. Analysis to Action for teaching: Applying data results to planning; Decision-making for changes in teaching
4. Presentation of Research: Research writing process

EDUC 5210. Sheltered English Instruction for the ESL Classroom**3 Credits (3)**

Addresses the acquisition of English proficiency via the SIOP (Sheltered Instruction Observational Protocol) a research validated model for lesson planning and implementation that provides English learners with access to grade-level standards.

EDUC 5220. Language, Literacy and Culture in the ESL Classrooms**3 Credits (3)**

Framework and strategies for developing the written abilities of second language learners. Explore different theories of language, culture and literacy by analyzing the interconnections between language, culture and literacy.

EDUC 5310. Methods of Teaching Elementary School Science**3 Credits (2+2P)**

Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Students should have 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department to enroll in this course. Taught with EDUC 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810; EDUC 5320; READ 5310.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons;
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction;
3. Develop assessment tools to evaluate learner's science knowledge;
4. Identify and use appropriate NMSTEM Ready!State science standards for lesson planning;
5. Integrate science with all subjects;
6. Discuss the advantages and the importance of membership in national/international professional organizations(e.g. NSTA) as well as subscribing to professional journals;
7. Identify science educational resources available using a variety of technological tools to enhance learning;
8. Demonstrate competence and confidence in teaching science;
9. Demonstrate basic classroom management skills.

EDUC 5320. Methods of Teaching Elementary School Mathematics**3 Credits (2+2P)**

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Taught with EDUC 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: MATH 1134.

Corequisite: ECED 5810; EDUC 5310; READ 5310.

Learning Outcomes

1. Identify what makes a 'good mathematical task', and how a good task can support students' learning;
2. Understand how children make sense of key mathematics concepts;
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving;
4. Identify your role as a teacher in a math classroom;
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching;
6. Adjust lessons and instruction based on students' needs;
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching;
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process;
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics

EDUC 5330. Methods of Teaching Elementary School Social Studies**3 Credits (2+2P)**

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Taught with EDUC 4330 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: READ 5320.

Learning Outcomes

1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

EDUC 5410. Teaching Science at the Middle and High School Level**3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

**EDUC 5420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as EDUC 4420 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

**EDUC 5430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)**

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 4430 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

**EDUC 5440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)**

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 4440 with differentiated assignments for graduate students. TEP required. May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

**EDUC 5510. Elementary Science Development
3 Credits (3)**

Understanding of the research on elementary development of science and its application in the classroom. Focus on how elementary students come to understand topics in the physical sciences, life sciences, and earth and space sciences. Includes applications to engineering and technology. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

**EDUC 5520. Elementary Mathematics Development I
3 Credits (3)**

Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students come to understand counting, the base 10 number system, and connections between early number understanding, geometric representations, fractions, and operations in later grades. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of mathematics into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of mathematics.

EDUC 5530. Elementary Mathematics Development 2**3 Credits (3)**

Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students develop multiplicative reasoning from a foundation of additive reasoning, connections to geometric representations, and how multiplicative reasoning supports development of understanding of fractions, ratios, and rate—which leads to proportional reasoning. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

EDUC 5540. Leadership Advocacy in Elementary Mathematics and Science**3 Credits (3)**

This course focuses on development of elementary mathematics and science specialists' leadership qualities necessary to promote and advocate for positive change through active participation with other professionals and in their own professional growth that draws upon current research in their respective fields, development of professional development programs, evaluation of educational structures that impact equitable access to high quality instruction, and communication with stakeholders directly and indirectly associated with education institutions. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To leverage current research on elementary students' development of mathematics science to enact change in teaching practice and education policy.
2. To make use of leadership skills to facilitate discussion with education stakeholders, school and district administrators, and teaching professionals.
3. To make use of leadership skills to collaborate with education stakeholders, school and district administrators, and teaching professionals.
4. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with current research on best practices.
5. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with district and/or school mission and vision.

EDUC 5810. Student Teaching**6 Credits (6)**

Integrated with EDUC 5811. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary.

Corequisite: EDUC 5811.

Learning Outcomes

1. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
6. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues
7. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
8. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
9. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. 1
10. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

EDUC 5811. Teaching Methods Laboratory**3 Credits (3)**

Practical application of previously learned content. Students must have a Bachelors degree and admission to the Graduate School and departmental special program. May be repeated up to 3 credits.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

EDUC 5990. Master's Thesis**1-6 Credits (1-6)**

Thesis. A minimum of four credits and a maximum of six credits (thesis hours) can be counted toward the MA degree. The thesis hours require the permission of the course instructor. May be repeated up to 15 credits. May be repeated up to 15 credits.

Learning Outcomes

1. Graduate students at the Master of Arts level pursuing a research focus degree learn how to prepare for basic research study.
2. Graduate students at the Master of Arts level pursuing a research focus degree learn how to submit IRB for a research study.
3. Graduate students at the Master of Arts level pursuing a research focus degree learn how to conduct a comprehensive study.
4. Graduate students at the Master of Arts level pursuing a research focus degree learn how to summarize the research and write the results in a thesis.
5. Graduate students at the Master of Arts level pursuing a research focus degree learn how to present results from research and defend the results.

EDUC 5991. Special Research Programs**1-3 Credits (1-3)**

Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in a specific research topic.

EDUC 5992. Directed Study Courses in Education**1-3 Credits (1-3)**

Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in a specific education topic.

EDUC 5996. Special Topics**1-3 Credits (1-3)**

Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 5997. Capstone Research Project**1-3 Credits (1-3)**

Capstone project. Maximum of 3 credits per semester and a total of 6 credits overall. Consent of Instructor required. Restricted to: Admittance into the Master of Arts in Education: Elementary Mathematics and Science program.

Learning Outcomes

1. To investigate a problem or issue in education.
2. To communicate results of the investigation in a scholarly manner.

EDUC 5998. Social Studies/Language Arts Methods Internship
3 Credits (3)

Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 5998. Restricted to CI and HSS non-degree students. May be repeated up to 3 credits.

Learning Outcomes

1. Carry out a successful internship in social studies and language arts teaching methods.

EDUC 6110. Curriculum for a Diverse Society
3 Credits (3)

Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on the significance of the teachers' professional role in schools;
2. Analyze the notion of curriculum in a broader sense along with the concepts of culture and diversity;
3. Develop understanding of the fundamental theoretical constructs in organizing the way we interact and live in our society;
4. Assume the commitment to challenge the taken for granted assumptions that have led schools to be places where inequities have been perpetuated;
5. Take on the challenge of transforming schools into public social spheres where hope is promoted, looked for, and risks are taken and faced.

EDUC 6120. Pedagogy of Learning in a Diverse Society
3 Credits (3)

Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Instill a personal discipline that will establish clarity into your plan of studies to operationalize the direction of your research project;
2. Develop a deeper and thicker knowledge base, language facility, and chronological understanding that impact contemporary theoretical/philosophical paradigms;
3. Create a critical reflection on many of the contemporary issues/findings of recent brain research, its implications for pedagogy and andragogy and central to teaching and learning;
4. Articulate several of the diverse historical forces that legitimate certain teaching and learning practices, theories/issues in contemporary schooling life, and delegitimize other theories/issues just as easily;
5. Create a sense of collegiality and community with your seminar colleagues inside and outside of this course

EDUC 6210. Curricular Mediation for Democratic Communities
3 Credits (3)

Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BLED 6210. May be repeated up to 3 credits.

EDUC 6220. Praxis and Reflexivity
3 Credits (3)

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, READ 6220. May be repeated up to 3 credits.

EDUC 6230. Research as Praxis
3 Credits (3)

Alternative community-or-school-based research aimed at investigating and transforming educational realities, with the participants for their own benefit. Students will experience the dynamic between research theory and practice in education. Restricted to: EDUC,C I,C ID majors. May be repeated up to 3 credits.

Prerequisite: EDUC 6420.

EDUC 6310. Critical Theory and Pedagogy
3 Credits (3)

Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BLED 6310. May be repeated up to 3 credits.

EDUC 6320. Social Justice Issues in Education
3 Credits (3)

Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BLED 6320. May be repeated up to 3 credits.

EDUC 6330. Critical Race Theory & Storytelling in Educational Spaces
3 Credits (3)

An upper-level doctoral course focusing on the philosophical, theoretical, and methodological origins and practices of CRT and the sister frameworks that emerged from CRT, i.e., AsianCrit, BlackCrit, FemCrit, LatCrit, QueerCrit, TribalCrit, and WhiteCrit within educational spaces. May be repeated up to 3 credits.

Learning Outcomes

1. Articulate the major tenets and assumptions of critical race theory (CRT);
2. Evaluate CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses;
3. Synthesize research conducted by CRT scholars and the effect of racial injustice on students of color;
4. Analyze and disrupt majoritarian narratives (stories) that perpetuate racial injustice in the U.S., with a focus on institutions that intersect with educational systems.

EDUC 6410. Current Research in Educational Practice
3 Credits (3)

A seminar for doctoral and education specialist students emphasizing current research and educational practices. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of a specific education research topic.

EDUC 6420. Evaluation of Quantitative Research in Education
3 Credits (3)

A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6430. Advanced Statistics
3 Credits (3)

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. A computer package will be the primary tool for data analysis.

Prerequisite: EDUC 6420 or equivalent course work.

Learning Outcomes

1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for research in education.
2. Demonstrates knowledge of and applies research techniques appropriate to a research problem.

EDUC 6440. Qualitative Research I
3 Credits (3)

This course offers an examination of qualitative research approaches used in educational and social settings, with a focus upon research design, field relations, data collection and analysis, and writing from a qualitative perspective. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6910. Dissertation Seminar
3 Credits (3)

Dissertation seminar course for doctoral students utilizing a qualitative research design. May be repeated up to 3 credits.

Learning Outcomes

1. To investigate a problem or issue in education.
2. Prepare the first three chapters of a dissertation.

EDUC 6990. Practicum
2-6 Credits (2-6)

Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction. Students must be in post-master's standing. May be repeated up to 6 credits.

Learning Outcomes

1. Plan course of study with with faculty advisor or instructor.
2. Set practicum expectations for semester.

EDUC 6991. Doctoral Research
1-15 Credits (1-15)

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in a specific research topic.

EDUC 6996. Selected Topics
1-6 Credits (1-6)

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 6 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

EDUC 6997. Independent Study Topics
1-3 Credits (1-3)

A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.

Learning Outcomes

1. Plan course of study with with faculty advisor or instructor
2. Set course expectations.

EDUC 6998. Internship in Curriculum and Instruction
3-6 Credits (3-6)

For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. Complete an educational internship.

EDUC 6999. Ed.S. Thesis
1-15 Credits (1-15)

Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.

Learning Outcomes

1. To investigate a problem or issue in education.
2. Prepare the a complete doctoral project.

EDUC 7000. Doctoral Dissertation
1-15 Credits (1-15)

Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Complete all phases of dissertation.
2. Defend dissertation

ELAD-EDUCATIONAL LEADERSHIP ADMINISTRATION

ELAD 2210. Leadership and Change in Education

3 Credits (3)

This course will introduce students to the challenges and key strategies in initiating, implementing, and sustaining educational change and reform. In the first part of the course, participants will learn about the challenges of educational change in the United States and the role that they as school leaders play in facilitating change and reform. The course continues with an examination of how culture, micro-politics, and power structures support or impede national and global change initiatives. The last part of the course offers suggestions for change agents including community organizing, culture building, and embracing sustainable leadership practices. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to communicate in clear manners that articulate, convey and deepen the understandings others have of issues affecting their communities.
2. Students will be able to collaborate on democratic processes.
3. Students will be able to communicate engage in critical social analysis and how the status quo fits into a larger movement for social change.

ELAD 2340. Multicultural Leadership in Education

3 Credits (3)

Introduction to the social and cultural constructions of gender, class, and race. Students will critically apply theoretical constructs to everyday life and discuss the intersection of gender and race with class inequality in national and global contexts. Using a social justice framework, readings, and assignments integrate a variety of racial/ethnic groups while considering the effects of historically uneven resource distribution, unearned privilege, forms of domination and subordination, immigration status, and cultural representation and ideologies. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.

Learning Outcomes

1. Students will develop awareness of their own social identities.
2. Students will recognize differences among various communities, perspectives, and world-views.
3. Students will describe how privilege and biases impact our communities and systems.
4. Students will create meaningful peer-to-peer relationships.
5. Students will understand the impact of their actions on community members.
6. Students will identify their leadership skills to shape social change on and off campus.
7. Students will act on opportunities to promote social change.
8. Students will use academic resources including advising, computers, printing, library, and space.

ELAD 2996. Special Topics in Educational Leadership

1-3 Credits (1-3)

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Students will be able to engage in systems thinking which aids in seeing how individual situations are shaped by a broader contexts
2. Students will be able to understand how to apply theoretical frameworks for understanding social problems.
3. Students will be able to help develop leadership capacity in others.
4. Students will be able to gain an understanding of cultural competence, which recognizes that diverse perspectives strengthen the dialogue and approaches to solving social problems.

ELAD 3110V. Introduction to Educational Leadership in a Global Society

3 Credits (3)

Multinational educational systems covered through knowledge of the U.S. system of education promoting critical leadership roles every citizen plays in the success of educational systems. May be repeated up to 3 credits.

Learning Outcomes

1. Students will share reflections on issues of national and global importance in the field of educational leadership.

ELAD 3210. Current Issues In Educational Leadership

3 Credits (3)

This course addresses issues such as the rise in international education, education's costs, social media's role and influence, changes in state and national funding trends, student and faculty/staff diversity, among others. The focus of this course is centered on the actions and responses of administrators to the current issues they are facing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will identify the overarching issues that leaders in educational institutions are or will be facing;
2. Students will articulate a more multicultural perspective through which to view the possible impact of these current issues on both those within the institution and those who are impacted by these institutions;
3. Students will reconstruct their perspective to allow for a greater awareness of the how these current issues might differentially impact culturally, linguistically, and socio-economically diverse populations;
4. Students will criticize inequitable examples of unfair educational policy and explore ways in which to develop culturally responsive practices when addressing current issues

ELAD 3996. Special Topics in Education

1-3 Credits (1-3)

Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 4110. Management of Student Services**3 Credits (3)**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) for early entry level positions. This course will provide students with an examination of foundations and principals of student services. Important theories and essential competencies needed in order to be successful will be explored through a social justice perspective of leadership. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the origins of student services concerning social and historical events programs.
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services
4. Critique inequity issues in student services as they relate to institutions of higher education and how social justice action might improve or eliminate such inequities.
5. Explain the primary legal foundations, ethical standards, and daily operation of student services programs.

ELAD 4120. Principles of Education Law and Policy**3 Credits (3)**

Overview of the use of law and policy in schools and higher education. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the options on policy issues using the statutes, cases, regulations, and legislative history as their tools.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.
4. Compare and contrast how higher education law differs between private and public higher education.

ELAD 4130. Principles of Education Budgeting and Finance**3 Credits (3)**

Analysis of budget and finance practices in education. Restricted to: E AD majors. May be repeated up to 3 credits.

Learning Outcomes

1. Identify opportunities to use research and individual projects to explore issues related to topics of interest to them
2. Describe ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 4410. Foundation for School Library Specialists**3 Credits (3)**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Taught with ELAD 5410. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic competencies for library specialists.

ELAD 4420. Administration of the School Library**3 Credits (3)**

Principles and practices related to the function, structure, and management of school libraries. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic competencies for library administration.

ELAD 4510. Elements of Research**3 Credits (3)**

This course provides students with a foundation for understanding educational research. The course will also provide grounding in proper writing format for use in the education profession. Students will be introduced to various research paradigms and the symbiosis of theory and practice. Besides introducing students to the symbiosis of theory and practice, students will complete assignments and activities that demonstrate the use of that symbiosis. Ultimately, students will be able to use the knowledge they gain through the course to be able to critique educational research. May be repeated up to 3 credits.

Learning Outcomes

1. Define what good research entails
2. Critique journal articles dealing with educational leadership
3. Use proper APA format in writing papers and written discussion
4. Use ethical standards for decision making in research

ELAD 4998. Internship**3 Credits (3)**

The undergraduate Educational Leadership major requires that students complete two internships. Internships provide students with either experience working in an area of administration that is different from the student's regular job or experience conducting research for a program or project. Each internship placement site and scope of work is determined through consultation with the course instructor. Students must complete 120 hours of work with the selected internship site. Student must be an E AD major and be within (at least) one year of graduation. May be repeated up to 6 credits.

Learning Outcomes

1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 5110. The Principalship**3 Credits (3)**

Key issues surrounding the role of school-site leaders. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Students will examine the complexities of school leadership.
2. Students will create a school culture representative of their own core values.
3. Students will assess the role and importance of the principal in facilitating change, managing conflict, promoting an active anti-racist environment, celebrating diversity, and establishing accountability for all students' learning.

ELAD 5120. Leadership and Administration of Bilingual Education
3 Credits (3)

Concepts and practical approaches to improving the education of English languages learners through higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Examine the complexity and overarching issues encompassing the role of the school leader as it pertains to the broader and narrower goals of bilingual education
2. Develop critical understandings of educating equitably, involving the development and sustainability of bilingual education programs which focus on making schooling meaningful and comprehensible for the millions of children whose home languages are different from the dominant language of school and society

ELAD 5130. Basing Decision on Data: Pk-12
3 Credits (3)

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of instructor is required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Identify various types of data and their uses in decision-making
2. Identify federal and state assessment programs, as well as local assessment requirements, and the policies that drive them
3. Explain how data from multiple sources is used to inform decision making about student achievement

ELAD 5140. Educational Financial Management
3 Credits (3)

Educational finance and business applications. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand and be able to use and explain to lay people the technical language used to discuss education finance issues.
2. Analyze, interpret, and present financial data, trends, and issues to various publics served by the schools and outline possible actions and their implications

ELAD 5150. Public School Law
3 Credits (3)

Legal processes of education, major court decisions, and the legislative process will be studied. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand the critical issues involved in applying the law fairly and justly
2. Understand the complex nature of the federal, state, and local authority levels as they relate to applying statutory and constitutional law

ELAD 5160. Management of Educational Change: Public Schools
3 Credits (3)

Leadership in implementing innovations in education. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Students will gain insight into how the structure of schools in the United States impacts the success or failure of educational change and reform.
2. Students will understand the role of implementing or resisting educational change efforts

ELAD 5170. Special Education Administration
3 Credits (3)

Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Knowledge of interactive systems and sub-systems and the influence of internal and external environments on the supervisory and improvement processes.
2. Understanding of research and effective professional development practices tied to curriculum, improvement of instructional delivery and student achievement.

ELAD 5180. Internship Public Schools Part I
3 Credits (3)

First half of a practical internship in Pk-12 schools under supervision of school administrator. The course must be passed with a grade of "B" or higher. Consent of Instructor required. 3 years of Pk-12 teaching experience required. Restricted to: E AD majors. . May be repeated up to 3 credits.

Prerequisite: 18 cr. of ELAD course work; 3.0 GPA or better.

Learning Outcomes

1. A clear understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education

ELAD 5185. Internship: Public Schools Part II
3 Credits (3)

Second half of a practical internship in Pk-12 administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: ELAD 5180; 3.0 GPA or better.

Learning Outcomes

1. A understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment.
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education.

ELAD 5210. Community College Administration**3 Credits (3)**

An overview of the history, role, objectives and patterns governing the effectiveness of the community college. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people;
2. Consider how organization, governance, and finance in higher education vary by institutional type, control, and mission;

ELAD 5215. Higher Education Administration**3 Credits (3)**

This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people
2. Consider how organization, governance, and finance in higher education vary by institutional type, control and mission
3. Gain familiarity with major issues facing U.S. higher education

ELAD 5220. Management of Educational Change: Higher Education**3 Credits (3)**

Leadership in implementing innovations in education in higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Student will gain the insight into how the structure of schools in the United States impacts the success or failure of educational change.
2. Student will understand the role of implementing or resisting educational change efforts

ELAD 5230. Higher Education Finance and Funding**3 Credits (3)**

This course examines the impact and process of financing and funding higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Identify opportunities to use research and individual projects to explore issues related to issues of topics of interest
2. Describe the ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 5240. Management of Student Services in Higher Education**3 Credits (3)**

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services.

The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Explain the origins of student services in relationship to social and historical events
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services programs.

ELAD 5250. Higher Education Law**3 Credits (3)**

This course is designed to review the impact of the legal process and the judiciary on higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Analyze the options on policy issues using the statutes, cases, regulations, and legislative history as their tool.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.

ELAD 5260. Administration of Adult and Continuing Education**3 Credits (3)**

Administration of programs in public schools, higher education, community and nontraditional educational settings. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Analyze adult education theory and the intersection of social justice to inform adult education program planning.
2. Assess the needs of specific populations for adult education programming

ELAD 5270. Basing Decision on Data: Higher Education.**3 Credits (3)**

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Participants will understand the importance of using assessment data in decision-making and identify reasons why these skills are important to educational leaders in college and university settings.
2. Participants will evaluate the assessment structure of one institution or department in higher education, using a criteria-based measurement tool (rubric).
3. Participants will reflect on possibilities of using assessment data to further social justice outcomes in higher education.

ELAD 5280. Internship: Higher Education Part I**3 Credits (3)**

First half of practical internship in administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: 15 credits of ELAD coursework and consent of instructor; .

Learning Outcomes

1. Understand the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Will provide a platform for leaders to analytically reflect on the complexity of ethical cases in which the administrator will confront in the scope of administrative role

ELAD 5285. Internship: Higher Education Part II**3 Credits (3)**

Second half of a practical internship in an administrative setting under supervision of an experienced higher education administrator. Internship placement determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: ELAD 5280; 3.0 GPA or better; .

Learning Outcomes

1. Enhance knowledge and practice of higher education administration, keeping in mind that experiences should provide opportunities for thoughtful examination of the diversity of the ways and manners in which office supervisors and staff conduct their work.
2. Provide practical experience and opportunity to examine and apply learned theoretical concepts within a supportive, supervised environment.
3. Develop skills related to higher education management and leadership.

ELAD 5310. Leadership for Social Justice and Equity**3 Credits (3)**

Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Acquired knowledge of multicultural issues as they relate to race, ethnicity, class, and gender and how these factors intersect with current educational leadership trends;
2. Developed a more multicultural perspective which will lead to greater awareness of the needs of culturally, linguistically, and socio-economically diverse students and an ability to develop/enhance an educational leadership lens designed to promote equity and access for all students;

ELAD 5320. Educational Leadership, Supervision, and Evaluation**3 Credits (3)**

Leadership, supervision, and evaluation in Pk-12 and post secondary education. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. To acquire a basic knowledge of the processes, persons, and practices of educational leadership and supervision.
2. To develop personalized understandings of leadership and supervisory roles.
3. To relate leadership and supervision theory to practice.
4. To develop a concept of good administrative/supervisory practice.
5. To develop a diverse awareness of leadership and supervisory issues and techniques.

ELAD 5410. Foundation for School Library Specialists**3 Credits (3)**

Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELAD 4410. May be repeated up to 3 credits.

Learning Outcomes

1. Understand basic competencies for library specialists.

ELAD 5510. Elements of Research**3 Credits (3)**

Survey and analysis of research methods and designs focusing on sound educational research and its presentation. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Explain the purpose of research
2. Analyze the need for research by practicing educational administrators
3. Describe the differences between qualitative research and quantitative research

ELAD 5992. Special Problems.**1-3 Credits (1-3)**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives will vary based on course content.

ELAD 5996. Special Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 5997. Independent Studies**1-3 Credits (1-3)**

Individual investigation in special topic areas. Requires prior approval of project advisor. May be repeated up to 9 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 6110. Organizational Theory**3 Credits (3)**

The overarching objectives of this class is to prepare educational leaders who comprehend the complexities of educational organizations, especially those with significant underrepresented populations; to initiate or maintain leaders' commitment to educational programs that embrace all learners; and to promote within leaders an understanding of the necessity of upholding social justice, primarily as it applies to issues, such as race, ethnicity, class, ability, religion, and gender. Consent of Instructor required. Restricted to: E AD majors.

Learning Outcomes

1. Understand and implement organizational theory.

ELAD 6120. Elements of Research**3 Credits (3)**

Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate self within educational research, Analyze what good research entails
2. Use proper APA (7th ed.) format in writing papers and in written discussions
3. Synthesize scholarly literature, Understand social justice in research and practice
4. Work on small pieces of active research to gain an understanding of what it entails

ELAD 6210. Quantitative Research I**3 Credits (3)**

Explores quantitative research methods, the rationale and assumptions that guide statistical decisions, beginning level statistical analyses, and how all of these are applied in the field of educational leadership. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6220. Qualitative Research I**3 Credits (3)**

Explores qualitative research methods and models and their application in the field of educational leadership. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6310. Concepts of Leadership in Education**3 Credits (3)**

Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement important concepts central to effective educational leadership

ELAD 6320. Foundations of Educational Administration**3 Credits (3)**

Advanced course about the political, economic, and social forces on policy making and governance of PK-12 and postsecondary education. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of the concepts of school leadership, and the political, social and economic contexts that impact schools.

ELAD 6410. Quantitative Research II**3 Credits (3)**

Intermediate quantitative methods of research, statistical analyses, and their application in the field of educational leadership. Restricted to Doctoral students only. May be repeated up to 3 credits.

Prerequisite: ELAD 6210.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6510. Qualitative Research II**3 Credits (3)**

Advanced qualitative methods of research and implementation in the field of educational leadership. May be repeated up to 3 credits.

Prerequisite: ELAD 6220.

Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6520. Public School Law**3 Credits (3)**

Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. The student will articulate an understanding of basic legal concepts through examination and discussion of relevant court cases.

ELAD 6525. Higher Education Law**3 Credits (3)**

This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. Consent of Instructor required.

May be repeated up to 3 credits.

Learning Outcomes

1. Consider CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses.

ELAD 6610. Scholarly Writing and the Southwest Border**3 Credits (3)**

This course is designed to provide doctoral-level students with an opportunity to engage with scholarly and academic writing in a meaningful manner. Scholarly writing and academic writing are often used interchangeably. They will be used in that manner for this course. Generally defined, academic writing refers to a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise. Scholarly writing is the specific genre of writing that is used in all academic fields. For this course, the scholarly writing is contained to the context of the Southwest Border and Borderland issues. This is designed in consideration of and relates to the Department and Program's mission, which takes into account social justice and border education issues. Additionally, the course will cover topics associated with scholarly writing that include, but not limited to: formal language, tone, precision, clarity, word choice, and assumptive statements versus research-supported rationale. Consent of Instructor required. Restricted to: E AD majors.

Learning Outcomes

1. Understand and implement place-based writing through and about the Southwest Border.

ELAD 6620. Evaluation Design in Education**3 Credits (3)**

Advanced course that focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Objectives change based on course content.

ELAD 6630. Educational Financial Management**3 Credits (3)**

This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of the basic concepts of school budgeting and finance practices.

ELAD 6635. Higher Education Finance and Funding**3 Credits (3)**

This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will study the impact of the higher education budget on various departments and services at the university level.

ELAD 6710. The Professoriate**3 Credits (3)**

The purpose of this course is to explore the body of scholarly knowledge and research appropriate for the study of American higher education, the context in which teaching and learning occurs, and faculty's roles in the process. We will discuss the number, variety, and purpose of the various types of institutions; the different roles that faculty members play within these institutions; how faculty work is assessed and valued within the outside of the university; administrative regulations related to faculty work; current issues related to the general state of the professoriate; as well as how does one prepare to enter the professoriate.

ELAD 6910. Dissertation Seminar**3 Credits (3)**

Same as CEPY 6450. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Formulate a research purpose and driving question about a specific topic.

ELAD 6991. Doctoral Research**1-15 Credits (1-15)**

Research. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.

Learning Outcomes

1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

ELAD 6996. Selected Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. May be repeated up to 6 credits.

Learning Outcomes

- Objectives change based on course content.

ELAD 6998. Advanced Internship**1-6 Credits (1-6)**

For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

- Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 7000. Doctoral Dissertation**1-9 Credits (1-9)**

Dissertation. Minimum of 3 credits per regular semester. May be taken for a maximum of 36 credits. Consent of instructor required. May be repeated up to 36 credits.

Learning Outcomes

- Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

ELT - ELECTRONICS TECHNOLOGY

ELT 103. Math Study Skills for Electronics**1 Credit (1)**

Covers specific math study skills and critical thinking processes to reinforce practical applications of math and its use with electronics. The student will be introduced to electronic mathematical formulas during the problem-solving steps required for circuit analysis. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): E T 183 OR E T 184. Restricted to Community Colleges only.

ELT 105. Basic Electricity and Electronics**3 Credits (2+2P)**

Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated circuits and other solid state devices, computers, fiber optics, and industrial application topics. Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 111

ELT 110. Electronics I**4 Credits (3+3P)**

Fundamentals of electronics including: components, schematics, Ohm's law, Thevenin's and Norton's theorems, and series/parallel circuits incorporating passive, active and magnetic elements. Introduction to AC circuits. Crosslisted with: AERT123. Restricted to: Community Colleges only.

ELT 120. Mathematics for Electronics**4 Credits (4)**

Includes fundamental mathematics, algebra, sine, cosine, and other elementary functions as they specifically apply to the operation, manipulation, and evaluation of direct current (DC) and alternating current (AC) circuits. Minimum math proficiency of CCDM 114 required or math placement into MATH 1215 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 124

ELT 135. Electronics II**4 Credits (3+3P)**

Analysis of AC circuits, filters, and resonance. Introduction to solid state fundamentals including diodes and rectifier circuits, voltage regulators, various transistors and transistor characteristics, amplification and amplifiers, photoelectric effects, gates and timing circuits. Restricted to Community Colleges campuses only.

Prerequisite(s): ELT 110 and ELT 120.

ELT 155. Electronics CAD and PCB Design**3 Credits (2+2P)**

Introduction to and the use of commercially available CAD software covering schematic representation of electronic components and circuits. Printed circuit board layout techniques including proper schematic capture, netlist generation, design rule checking and manual routing covered.

ELT 160. Digital Electronics I**4 Credits (3+3P)**

Number systems, codes, Boolean algebra, logic gates, Karnaugh maps, combination circuits, flip-flops, and digital troubleshooting techniques. Restricted to: Community Colleges only.

Prerequisite(s): ELT 110 and (ELT 120 or MATH 1215).

ELT 175. Soldering Practices**3 Credits (2+2P)**

Methods and techniques of hand soldering in the production of high quality and reliable soldering connections. Restricted to: Community Colleges only.

ELT 205. Semiconductor Devices**4 Credits (3+3P)**

Analysis and trouble shooting of linear electronic circuits including amplifiers, op-amps, power supplies, and oscillators. Restricted to: Community Colleges only.

Prerequisite(s): ELT 110 and ELT 135.

ELT 215. Microprocessor Applications I**4 Credits (3+2P)**

Fundamentals of microprocessor architecture and assembly language with an emphasis on hardware interfacing applications.

Prerequisite(s)/Corequisite(s): ELT 235. **Prerequisite(s):** ELT 160.

Restricted to: Community Colleges only.

ELT 220. Electronic Communication Systems**4 Credits (3+2P)**

Principles and applications of circuits and devices used in the transmission, reception, and processing of RF, microwave, digital and telecommunications systems.

Prerequisite(s)/Corequisite(s): ELT 205. **Prerequisite(s):** ELT 135.

Restricted to: Community Colleges only.

ELT 221. Cooperative Experience I**1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.

Prerequisite: consent of instructor.

ELT 222. Cooperative Experience II**1-6 Credits**

Continuation of ELT 221. Maximum of 6 credits. Graded S/U.

Prerequisite: consent of instructor.

ELT 225. Computer Applications for Technicians**3 Credits (2+2P)**

An overview of computer hardware, software applications, operating systems, high level programming languages and networking systems.

ELT 230. Microprocessor Applications II**4 Credits (3+2P)**

Advanced microprocessor interfacing techniques. Topics in A/D and D/A conversion, I/O port address decoding, direct memory accessing, and peripheral device interfacing applications.

Prerequisite: ELT 215.

ELT 235. Digital Electronics II**3 Credits (2+2P)**

Sequential logic circuits, latches, counters, shift-registers, fault analysis and troubleshooting of digital IC s, multiplexers, timers, encoders/decoders, arithmetic circuits, pulse shaping, and memory devices.

Restricted to: Community Colleges only.

Prerequisite(s): ELT 160.

ELT 240. Introduction to Photonics**4 Credits (3+2P)**

Nature of light, light emitters, lasers, detectors, fiber optics communications systems, and other applications of light to electronics.

Prerequisite: ELT 135 or consent of instructor.

ELT 245. Radar: Principles and Applications**3 Credits (3)**

Explores the principles of operation for microwave radar applications and supporting subsystems.

Prerequisite: E T 246.

Learning Outcomes

1. Students will analyze the various factors that comprise the Radar Equation and apply the equation in calculations for various scenarios.
2. Students will explain the principles of Moving Target Indication, Pulse Doppler, Phased Array, and Synthetic Aperture Radars, and their advantages and disadvantages.
3. Students will analyze and calculate the effects of clutter and environmental noise, earth surface scattering, and atmospheric attenuation, diffraction, and refraction on radar propagation.
4. Students will analyze the performance of supporting radar subsystems, including transmitters, receivers, antennas, tracking servos, and signal processing.
5. Students will explain the kinds of information that can be obtained from radar signals and perform calculations associated with range determination, target motion resolution, and error.
6. Students will explain the use of telemetry, and correlate test radar and telemetry measurements.
7. Students will explain and compare radar countermeasures and analyze their effect on radar return cross-sections.

ELT 250. Electronics Systems Analysis**2 Credits (1+3P)**

Capstone course emphasizing a systems approach to troubleshooting and maintaining complex electronics systems. Includes program review in preparation for technician certification.

Prerequisite: consent of instructor.

ELT 260. Instrumentation Control and Signal Conditioning**4 Credits (3+2P)**

Introduction to sensors and transducers, signal conditioning and transmission for measuring and process control systems. Includes AD, DA converter, small servos and actuators. **Prerequisite:**ELT 205.

ELT 265. Special Topics**1-6 Credits**

Topic to be announced in the Schedule of Classes.

ELT 270. Biomedical Equipment Instrumentation**4 Credits (3+2P)**

Principles and applications of electronic circuits and devices used in biomedical equipment. Skills taught to include evaluating, troubleshooting and repairing various types of medical equipment.

Prerequisite(s)/Corequisite(s): ELT 260. **Prerequisite(s):** ELT 205.

Restricted to: Community Colleges only.

ELWK-ELECTRICAL LINeworker

ELWK 130. Introduction to Electrical Power Systems**2 Credits (2)**

An overview of electrical power systems, equipment, safety practices, first aid and CPR. May be repeated up to 2 credits. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors. Restricted to Community Colleges campuses only.

Corequisite(s): OEET 110,OEET 131.

ELWK 131. Electrical Lineworker Lab I**6 Credits (12P)**

Climbing and work on utility poles using ropes and rigging, pole setting and an introduction to transmission and distribution line construction. Maintenance and troubleshooting to include the use of hot sticks. May be repeated up to 6 credits. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors. Restricted to Community Colleges campuses only.

Corequisite(s): OEET 110,OEET 130.

ELWK 140. Electrical Power Systems II**3 Credits (2+2P)**

Theory of power generation and distribution with emphasis on three phase systems to include transformers, voltage regulators, surge arrestors. Includes troubleshooting. May be repeated up to 3 credits. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors. Restricted to Community Colleges campuses only.

Corequisite(s): OEET 141.

ELWK 141. Electrical Lineworker II**6 Credits (12P)**

Practice in the installation of electrical power lines including transformers, voltage regulators, and surge arrestors. Also advanced hot sticking procedures, troubleshooting, underground systems procedures, and pole-top rescue. May be repeated up to 6 credits. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors. Restricted to Community Colleges campuses only.

Corequisite(s): OEET 140.

ELWK 221. Cooperative Experience I**1-4 Credits (1-4)**

Supervised cooperative work program. Student is employed in an approved occupation and is supervised and rated by the employer and instructor. Student will meet in a weekly class. May be repeated up to 4 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

Prerequisite(s): Consent of instructor.

ENGL-ENGLISH

ENGL 1105M. Intermediate ESL Composition and Grammar Review 3 Credits (3)

Development of fluent academic writing skills, with an emphasis on grammar review for editing purposes. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): Placement based on English language screening test, and either a minimum TOEFL score of 500 or consent of instructor.

ENGL 1110G. Composition I 4 Credits (4)

In this course, students will read, write, and think about a variety of issues and texts. They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers, and practice techniques for writing, revising, and editing.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing

ENGL 1110H. Composition I Honors 4 Credits (4)

In this course, students will read, write, and think about a variety of issues and texts. They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers, and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1110M. Composition I Multilingual 4 Credits (4)

In this course, students will read, write, and think about a variety of issues and texts. They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers, and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1120. Composition II**2 Credits (2)**

In this course, students will explore argument in multiple genres. Research and writing practices emphasize summary, analysis, evaluation, and integration of secondary sources. Students will analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading, writing, and research. Students will sharpen their understanding of how writing and other modes of communication work together for rhetorical purposes. The emphasis of this course will be on research methods.

Prerequisite: successful completion of ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Analyze the rhetorical situation for purpose, main ideas, support, audience, and organizational strategies in a variety of genres.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Use a variety of research methods to gather appropriate, credible information.
4. Evaluate sources, claims, and evidence for their relevance, credibility, and purpose.
5. Quote, paraphrase, and summarize sources ethically, citing and documenting them appropriately.
6. Integrate information from sources to effectively support claims as well as other purposes (to provide background information, evidence/examples, illustrate an alternative view, etc.).
7. Use an appropriate voice (including syntax and word choice).

ENGL 1410G. Introduction to Literature**3 Credits (3)**

In this course, students will examine a variety of literary genres, including fiction, poetry, and drama. Students will identify common literary elements in each genre, understanding how specific elements influence meaning.

Learning Outcomes

1. Identify, define, and understand basic literary conventions and themes in fiction, poetry and drama.
2. Write reasonable, well-supported analyses of literature that ethically integrate evidence from texts

ENGL 2130G. Advanced Composition**3 Credits (3)**

This course is for students who are striving for fluency, maturity, clarity and significance in their writing. It is an intermediate writing course that builds on and refines writing skills acquired in previous courses. It focuses on non-fiction writing for the professions, business, science, technical fields, academe and/or the popular press. Short works of master writers are studied for ideas, style and structure.

Learning Outcomes

1. Students will examine and apply different writing styles and modes used by masters of personal essay and keep a reading response journal of assigned readings as demonstrated by scoring a 70% in faculty designed assignments.
2. Students will develop a sense of audience by discussing their papers with each other in small groups during class or by reading each other's papers and participating in positive, helpful peer reviews as demonstrated by scoring a 70% in faculty designed assignments.

ENGL 2210G. Professional & Technical Communication**3 Credits (3)**

Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience.

Prerequisite(s): Grade of C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication

ENGL 2210H. Professional and Technical Communication Honors**3 Credits (3)**

Professional and Technical Communication writing for Crimson Scholars/ Honors students will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. 3.5 GPA is also required. Restricted to Las Cruces campus only.

Prerequisite(s): grade of C- or better in ENGL 1110G or the equivalent; approval of the honors college.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2210M. Professional and Technical Communication for Multilingual Students**3 Credits (3)**

Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. NMSU specific description: In this course, students will explore the unique advantages and challenges of being multilingual writers. This course is designed for international and domestic multilingual students.

Prerequisite: Grade of C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2215G. Advanced Technical and Professional Communication
3 Credits (3)

Theory and practice of writing in technical and professional fields, individualized to each student's field. Emphasizes efficient writing processes and effective written products. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): Junior or above standing, or consent of instructor.

Learning Outcomes

1. To complicate the definition of "technical and scientific communication" and its relationship(s) to studying and practicing "rhetoric."
2. To complicate our relationship to concepts like "science", "knowledge, "objectivity," neutrality, "clarity," etc.
3. To use a community-based approach to study and practice technical and scientific documents within various discourse communities.
4. To study and practice different genres (i.e. memos, letters, e-mails, reports, proposals, and instruction sets) attending to issues of audience and purpose within discourse communities.
5. To practice some mindful reading strategies that allow you to attend to the use of language and its material and discursive effects in different situations.
6. To examine the material effects of producing, circulating, and consuming technical and scientific texts on the bodies of people within different contexts.
7. To complicate our understanding of "ethics," "responsibility," and "accountability" toward ourselves and others.
8. To work collaboratively and individually to research, to analyze, and to write about public debates regarding the conduct of science and technology.
9. To understand and use basic principles of document design attending to issues of usability and accessibility. 1
10. To articulate the relationship between technical and scientific communication and issues of inclusion and social justice in the world.

ENGL 2221G. Writing in the Humanities and Social Science**3 Credits (3)**

Theory and practice in interpreting texts from various disciplines in the humanities and social sciences. Strategies for researching, evaluating, constructing, and writing researched arguments. Course subtitled in the Schedule of Classes. May be repeated up to 3 credits.

Prerequisite(s): Grade of C- or better in ENGL 1110G or ENGL 1110H, or ENGL 1110M.

Learning Outcomes

1. Develop the ability to interpret and respond to humanities and social sciences texts
2. Analyze and evaluate cultural artifacts such as texts, images, and practices as a means of academic inquiry
3. Critique arguments offered in the readings to determine the underlying methodology as well as underlying values
4. Construct a rhetorical argument with evidence appropriate for an explicit audience and purpose
5. Use written, visual, or oral strategies to persuade, inform, or engage, considering situation, audience, purpose, aesthetics, and diverse points of view
6. Practice effective research strategies, and integrate research correctly and ethically from credible sources
7. Understand and apply components of the writing process such as planning, collaborating, organizing, composing, revising, and editing

ENGL 2280. History of Argument**3 Credits (3)**

Investigates the major figures and movements in rhetoric from the classical period to modern rhetorical theory, examining relations between rhetorical teaching and practice, culture, epistemology, and ideology. Main campus only. **Prerequisite(s):** ENGL 1110G, or ENGL 1110GH, or ENGL 1110M

Learning Outcomes

1. Understand how rhetoric, argument, and persuasion work. Become familiar with the key terms and various contexts in which rhetoric, argument, and persuasion function and the contingencies that influence their use and effectiveness;
2. be familiar with the broad history and major figures of western rhetoric;
3. apply a number of approaches used to analyze and construct/deconstruct rhetorical arguments, including (but not limited to) Aristotelian appeals and commonplaces, stasis theory, toulmin analysis, pentadic/dramatistic analysis, fallacy analysis, and rogerian analysis;
4. complete an analysis as well as design and present a project regarding a contemporary issue or concern about which you feel deep passion and commitment; and
5. Improve general critical thinking and communication skills, both oral and written.

ENGL 2310G. Introduction to Creative Writing**3 Credits (3)**

This course will introduce students to the basic elements of creative writing, including short fiction, poetry, and creative nonfiction. Students will read and study published works as models, but the focus of this "workshop" course is on students revising and reflecting on their own writing. Throughout this course, students will be expected to read poetry, fiction, and nonfiction closely, and analyze the craft features employed. They will be expected to write frequently in each of these genres.

Prerequisite(s): ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Participate in a constructive conversation and community about creative writing.
2. Read and critically engage with a variety of texts.
3. Compose creative works in various genres of creative writing.
4. Provide respectful, honest, and critical feedback to peers about their work.
5. Revise creative work based on peer feedback and critique.
6. Develop thoughtful workshop reflection on students' own writing and writing process.
7. Evaluate and engage with publication process.

ENGL 2381. Script Development and Storyboarding**3 Credits (3)**

Examines effective writing principles for creating storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Crosslisted with: FDMA 2381.

Learning Outcomes

1. develop a story idea into a complete storyboard
2. describe and visualize the creative aspects of a media project from conception to completion
3. write a scene in the professional script format
4. deliver a professional verbal and visual presentation of a story idea to an audience
5. the ability to conceive, illustrate and plan a visual project
6. proficiency in oral, written, and visual communication via storyboarding, script writing and verbal presentations

ENGL 2382. Narrative: Principles of Story Across the Media**3 Credits (3)**

Examines the various strategies of written and visual storytelling, narrative structure and its principal components (plot, theme, character, imagery, symbolism, point of view) with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc.

Crosslisted with: FDMA 2382

Learning Outcomes

1. Identify use the building blocks of storytelling: plot, theme, character, imagery,
2. Symbolism and point of view
3. Develop these building blocks into a cohesive narrative within a written document
4. Effectively communicate in different written formats
5. Create design documents for varied genres of media: narrative short, documentary, 6 Animation, commercial/industrial video, computer game
6. Describe how a written narrative can be translated into a visual medium

ENGL 2520G. Film as Literature**3 Credits (3+3P)**

The purpose of this course is to teach students how to analyze film as a visual text. Students will learn to analyze films, film techniques, eras, and genres. Students will also identify significant trends and developments in film-making, examining the ways in which film reflects and creates cultural trends and values.

Learning Outcomes

1. Develop an understanding of the cultural, historical, and technical contexts for various films.
2. Identify, define, and analyze basic film techniques used in different genres and time periods.
3. Analyze how film uses literature by studying different sources of adaptation.
4. Demonstrate an understanding of film in its various aspects by writing film analysis, reviews, and/or other projects.

ENGL 2521. The Bible as Literature**3 Credits (3)**

Develops informed readings of Hebrew and Christian scriptures. Emphasizes understanding Biblical literary forms, techniques, themes; historical, cultural contexts for interpretation; authorship, composition, audience for individual books; development of Biblical canon.

Learning Outcomes

1. Develop and articulate historically informed and textually supported arguments regarding the form and meaning of biblical texts
2. Express arguments and explication in clear, organized,
3. Understand the Jewish and Christian scriptures as cultural artifacts, using some fundamental techniques of literary analysis and interpretation, especially: thematic interpretation, stylistic analysis, narrative analysis, poetics, and the rhetorical analysis of figurative language.
4. Use socio-historically informed interpretive methods focused on these fundamental contextual questions : 1) who probably wrote and edited these texts, 2) why and how they most likely did so, 3) how their earliest audiences probably responded to them, and 4) why and how they were later combined to form the canonical Jewish and Christian bibles read today.
5. Know in detail substantial selections of representative, influential, and historically informative biblical texts
6. Distinguish literary critical and historical analysis of the Bible from those based on faith, tradition, authority, and theology
7. Recognize, understand, and analyze the forms, genres, and techniques used by biblical authors
8. Become familiar with and be able to use essential knowledge of the historical, cultural, and geographical contexts of Biblical writing
9. Learn how evaluate texts as historical documents, as well as how doing so relates to and differs from literary critical analysis and interpretation 1
10. Become familiar with common and influential scholarly, critical, and aesthetic ways of reading Biblical texts from a contemporary perspective 1
11. Understand the cultural influence of the Bible and its relevance for other areas of scholarly and artistic work

ENGL 2610. American Literature I**3 Credits (3)**

This course surveys American literature from the colonial period to the mid-nineteenth century. This course provides students with the contexts and documents necessary to understand the origins of American Literature and the aesthetic, cultural, and ideological debates central to early American culture.

Learning Outcomes

1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2620. American Literature II**3 Credits (3)**

This course surveys American literature from the mid-nineteenth-century to the contemporary period. This course provides students with the contexts and documents necessary to understand American literature and the aesthetic, cultural, and ideological debates central to American culture.

Learning Outcomes

1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2630. British Literature I**3 Credits (3)**

This course offers a study of British literature from its origins in Old English to the 18th century. This survey covers specific literary works--essays, short stories, novels, poems, and plays--as well as the social, cultural, and intellectual currents that influenced the literature.

Learning Outcomes

1. Read and discuss representative works of British writers from its origins in Old English to the 18th century to understand cultural and historical movements which influenced those writers and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2640. British Literature II**3 Credits (3)**

This course offers a study of British literature from the 18th century to the present. This survey covers specific literary works—essays, short stories, novels, poems, and plays—as well as the social, cultural, and intellectual currents that influenced the literature.

Learning Outcomes

1. Read and discuss representative works of British writers from the 18th century to the present to understand cultural and historical movements, which influenced those writers, and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2650G. World Literature I**3 Credits (3)**

In this course, students will read representative world masterpieces from ancient, medieval and Renaissance literature. Students will broaden their understanding of literature and their knowledge of other cultures through exploration of how literature represents individuals, ideas and customs of the world cultures. The course focuses strongly on examining the ways literature and culture intersect and define each other.

Learning Outcomes

1. Identify and comprehend key authors and literary works from ancient periods to the Enlightenment.
2. Understand each text's historical and cultural context.
3. Identify and analyze a variety of literary forms, including poetry, plays, and philosophical and religious texts.
4. Compare works from different cultures and historical periods examining genre, style, and content or theme.
5. Analyze how literary works reflect historical, national, cultural, and ethnic differences.

ENGL 2675. Transatlantic Literatures**3 Credits (3)**

This course tracks the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years. Students examine a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts. Students consider how colonization, exile, displacement, and migration have track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years reinforced or contested national literary traditions.

Learning Outcomes

1. Track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years
2. Identify and analyze a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts
3. Explain how colonization, exile, displacement, and migration have reinforced or contested national literary traditions.

ENGL 2996. Special Topics**1-3 Credits**

Emphasis on a literary and/or writing subject chosen for the semester. Repeatable for a unlimited credit under different subtitles.

Learning Outcomes

1. Varies

ENGL 301. Theory and Criticism: Rhetoric and Culture**3 Credits (3)**

Introduction to rhetorical criticism with an emphasis on understanding the theoretical and cultural underpinnings for the rhetorical analyses of texts.

ENGL 302. Theory and Criticism: Literature and Culture**3 Credits (3)**

Introduction to literary criticism, from its classical beginnings through contemporary critical approaches.

ENGL 303. Theory and Criticism: Film, Media and Culture**3 Credits (3)**

Surveys classical and contemporary film theory. Explores the relationship of theory to textual analysis and filmmaking practices. Includes auteurism semiotics, psychoanalysis, and other theories, as well as theories of other media.

ENGL 304. Creative Writing: Prose**3 Credits (3)**

Imaginative writing, chiefly prose narrative. Repeatable for a maximum of 9 credits.

ENGL 306. Creative Writing: Poetry**3 Credits (3)**

Introduction to the writing of poetry. Repeatable for a total of 9 credits.

ENGL 307. Creative Writing: Creative Nonfiction**3 Credits (3)**

Introduction to creative nonfiction. Skills emphasized will include the personal voice, powers of observation and reflection, advocacy, argument, and a creative, powerful use of language. Repeatable for a maximum of 9 credits.

ENGL 308. Creative Writing: Playwriting**3 Credits (3)**

Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: THEA 308

ENGL 309. Screenwriting I**3 Credits (3)**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Consent of instructor required. Crosslisted with: CMI 309 and THTR 306

Prerequisite(s): ENGL 235 or CMI 235.

ENGL 310. Critical Writing**3 Credits (3)**

A course in critical reading, writing, and research designed to prepare English majors for upper-division courses.

ENGL 315. Writing for the Web**3 Credits (3)**

Introduction to writing for the World Wide Web through practical application and analysis on both theory and research. Allows hands-on learning in a computer classroom.

ENGL 321V. Modern European Drama**3 Credits (3)**

Masterworks of European drama from the late 18th century to present. Crosslisted with: THEA 321V

ENGL 322. Dramatic Character**3 Credits (3)**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. Crosslisted with: THEA 322.

ENGL 323. American Drama**3 Credits (3)**

Masterworks of American drama by noted American playwrights. Crosslisted with: THEA 323

ENGL 326. Cultural Identity and Representation Across the Media**3 Credits (3)**

Considers complex relationships between representation and culture including how images and language shape racial, ethnic, gender, sexual, and class identities. Examines theories from several disciplines. Includes lecture, discussion and production exercises.

ENGL 327V. Shakespeare around the Globe**3 Credits (3)**

Introduction to multicultural issues in Shakespeare's plays and to adaptations of Shakespeare's plays in other cultures.

ENGL 328V. Literature of Science Fiction and Fantasy**3 Credits (3)**

Survey and critical examination of the development of science fiction and fantasy as literature genres through selected authors and texts.

ENGL 329. Studies in Drama**3 Credits (3)**

Emphasis on a group of related works of European or American drama; topics will vary. Crosslisted with: THEA 329 and FDMA 329

ENGL 339V. Chicana/o Literature**3 Credits (3)**

Introduction to Chicano novels, short stories and selected creative nonfiction.

ENGL 354. Form and Technique in Fiction**3 Credits (3)**

Literature course designed for fiction writers, especially those English majors in the Creative Writing emphasis. The course combines the study of published fiction with the study of craft. Some of the assignments will require the student to write original fiction based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 356. Form and Technique in Poetry**3 Credits (3)**

Literature course designed for poets, especially those English majors in the Creative Writing emphasis. The course combines the study of published poetry with the study of craft. Some of the assignments will require the student to write original poems based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 358. Form and Technique in Playwriting**3 Credits (3)**

Literature course designed for playwrights, especially those English majors in the Creative Writing emphasis. The course combines the study of published plays and performances with the study of craft. Some of the assignments will require the student to write original plays based on exercises provided by the instructor. Repeatable up to 9 credits.

ENGL 363. Literature for Children and Young Adults**3 Credits (3)**

A comparative, historical survey of literature for young (K to 12th grade) readers. Emphasis on critical evaluation.

Prerequisite: junior or above standing.

ENGL 380V. Women Writers**3 Credits (3)**

Introduction to multicultural women's traditions through intensive study of works by women writers. Crosslisted with: GNDR 380V.

ENGL 392V. Mythology**3 Credits (3)**

Greek and Roman mythology and its impact on European and English literature. Readings in myths, classical plays, and other literature with mythological interest, including nonclassical myths.

ENGL 394V. Southwestern Literature**3 Credits (3)**

Introduction to multicultural literature of the Southwest: oral folk literature, literary fiction (classic and contemporary), nonfiction and poetry.

ENGL 399. Special Topics**3 Credits (3)**

Emphasis on a theme, genre, figure, or technique chosen for study during the semester. Repeatable under different subtitles.

ENGL 400. Independent Study: Upper Division**1-3 Credits**

For students with demonstrated aptitude for independent work. Approval of instructor required before registration. Repeatable under different subtitles.

ENGL 403. Web Design and Development**3 Credits (3)**

Combines study and practice of web design and development as rhetoric, technical, processual, and collaborative.

Learning Outcomes

1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility
5. Create usable, aesthetically pleasing, and functional websites

ENGL 404. User Experience and Assistance**3 Credits (3)**

Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.

Learning Outcomes

1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions.

ENGL 405. Chaucer**3 Credits (3)**

Principal works, with emphasis on *The Canterbury Tales*.

ENGL 407. Milton**3 Credits (3)**

Studies in Milton's works, including *Paradise Lost*.

Learning Outcomes

1. Analyze Milton's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Milton's poetry and prose;
3. Demonstrate ability to locate Milton's writings in historical and cultural context;
4. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a Working Bibliography and Research Paper on a topic related to our course material.

ENGL 408. Shakespeare I**3 Credits (3)**

Study in Shakespeare's early poems and plays. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 409. Shakespeare II**3 Credits (3)**

Study in Shakespeare's later plays. ENGL 408 is not a prerequisite. Repeatable for up to six credits under different subtitles. Crosslisted with THEA 409.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

ENGL 412. Writing in the Workplace**3 Credits (3)**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 413. Advanced Creative Writing: Prose Workshop**3 Credits (3)**

Imaginative writing, chiefly the narrative. May be repeated up to 12 credits.

Prerequisite(s): ENGL 304 or consent of instructor.

ENGL 414. Advanced Creative Writing: Poetry Workshop**3 Credits (3)**

For advanced writers of poetry. Repeatable for a total of 12 credits.

Prerequisite(s): ENGL 306 or consent of instructor.

ENGL 416. Approaches to Literature**3 Credits (3)**

Understanding, appreciation, techniques of instruction in the high school.

Prerequisite: at least 6 credits in upper-division English courses.

ENGL 417. Advanced Study in Critical Theory**3 Credits (3)**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301-303, strongly recommended. Repeatable under different subtitles.

ENGL 419. Modern Rhetorical Theory**3 Credits (3)**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the twentieth century.

ENGL 422. Advanced Study in a Literary Form or Genre**3 Credits (3)**

Close study of a topic in a particular literary form or genre. May be repeated under different subtitles.

ENGL 423. Advanced Study in a Major Author**3 Credits (3)**

Close study of selected works by a major author. May be repeated under different subtitles.

ENGL 430. Online Publishing**3 Credits (3)**

This three-credit course provides a theoretical background for online publishing and design as well as hands on experience publishing an online arts magazine.

ENGL 431. Technical Editing**3 Credits (3)**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 433. Victorian Literature**3 Credits (3)**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 442. Modern and Contemporary American Poetry**3 Credits (3)**

Studies the development of American poetry from World War I to the present. Repeatable under a different subtitle. May be repeated up to 6 credits.

ENGL 445. Postmodern Fiction**3 Credits (3)**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 446. Advanced Creative Writing: Nonfiction Prose**3 Credits (3)**

This workshop-format class for advanced writers will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 546. May be repeated up to 12 credits.

Prerequisite(s): ENGL 307 or consent of instructor.

ENGL 449. Advanced Study in Writing**3 Credits (3)**

Close study of a topic in composition, rhetoric and/or technical and professional communication. Repeatable for a maximum of 6 credits with permission of department.

ENGL 453. World Literatures**3 Credits (3)**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 458. Latino/a Literature and Culture**3 Credits (3)**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 460. Proposal Writing**3 Credits (3)**

Developing proposals and grants in a workshop setting.

ENGL 469. Advanced Study in American Literature**3 Credits (3)**

Covers selected works for a particular period of American literary history. Repeatable under different subtitles.

ENGL 470. Approaches to Composition**3 Credits (3)**

Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.

ENGL 471 M. Scholarly Writing for International Graduate Students**3 Credits (3)**

Instruction and practice in writing major academic genres, including experimental, descriptive, and problem-solution research reports, proposals, and library referenced papers. May be repeated up to 3 credits. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): Placement based on English language screening test or successful completion of ENGL 1105M; a minimum TOEFL score of 500 or consent of instructor; and successful completion of SPCD 108/490 where indicated by placement.

ENGL 478. Document Design**3 Credits (3)**

Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.

ENGL 479. Computers and Writing**3 Credits (3)**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 481. Women's Literature**3 Credits (3)**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 485 M. International Teaching Assistant Development**3 Credits (3)**

Prepares international graduate students for teaching assignments in their field of study and work at NMSU. Assists international/multilingual graduate students in developing communication and teaching studies necessary to fulfill duties their duties as teaching assistants at NMSU.

Learning Outcomes

1. Demonstrate effective communication strategies as an instructor
2. Apply a variety of teaching strategies to present and explain content in your academic field
3. Demonstrate understanding of different aspects of undergraduate education in the United States
4. Demonstrate understanding of diverse student populations at NMSU

ENGL 489. Cultural Studies: Literature and Theory**3 Credits (3)**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 497. Internship**3-6 Credits (3-6)**

Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.

ENGL 500. Supervised Study**1-3 Credits**

To prepare the student for the master's degree examinations by special studies in fields not covered in routine course work.

Prerequisite: consent of instructor.

ENGL 501. Online Publishing**3 Credits (3)**

This three-credit course provides a theoretical background for online publishing and design as well as hands-on experience publishing an online arts magazine. Taught with ENGL 430.

ENGL 502. Critical Conversations in Technical and Professional Communication**3 Credits (3)**

Introduces students to critical histories, theories, and key concepts in technical and professional communication across academic and industry boundaries.

Learning Outcomes

1. Understand the histories and politics of emergence of technical and professional communication as a field of study and expertise;
2. Identify and track key concepts, terms, and conversations that give shape to technical and professional communication;
3. Draw on a range of theories and methodologies to articulate and critique the function and effects of technical and professional communication;
4. Participate in disciplinary conversations through research and writing.

ENGL 503. Web Design and Development**3 Credits (3)**

Combines study and practice of web design and development as rhetorical, technical, processual, and collaborative.

Learning Outcomes

1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility

ENGL 504. User Experience and Assistance**3 Credits (3)**

Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.

Learning Outcomes

1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions

ENGL 505. Graduate Study in Chaucer**3 Credits (3)**

Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. May be repeated up to 3 credits.

ENGL 507. Special Topics in Rhetoric and Technical and Professional Communication**3 Credits (3)**

Seminar course centered on contemporary issues in rhetoric and technical and professional communication. Repeatable under different subtitles, for up to 6 credits.

Learning Outcomes

1. Use rhetoric inquiry and theory to contextualize and study technical and professional communication.
2. Understand the disciplinary overlaps, tensions, and possibilities among rhetoric and technical and professional communication.
3. Track a contemporary thematic trend, issue, or question through rhetoric and technical and professional communication.

ENGL 508. Graduate Study in Shakespeare I**3 Credits (3)**

Graduate study in Shakespeare's early poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 509. Graduate Study in Shakespeare II**3 Credits (3)**

Study in Shakespeare's late poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 510. Proseminar in Rhetoric and Professional Communication**3 Credits (3)**

Introduction to research in rhetoric and professional communication. Taught with ENGL 610.

ENGL 512. Graduate Study in Writing in the Workplace**3 Credits (3)**

Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 513. Creative Writing Workshop: Fiction**3 Credits (3)**

Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. May be repeated for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.

ENGL 514. Creative Writing Workshop: Poetry**3 Credits (3)**

Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.

ENGL 516. Graduate Study in Approaches to Literature**3 Credits (3)**

Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research.

Prerequisite: at least 6 credits in upper-division English courses.

ENGL 517. Graduate Study in Critical Theory**3 Credits (3)**

Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.

ENGL 518. History of Rhetoric**3 Credits (3)**

An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

ENGL 519. Graduate Study in Modern Rhetorical Theory**3 Credits (3)**

Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.

ENGL 521. Graduate Study in a Literary Period or Movement**3 Credits (3)**

Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 522. Graduate Study in a Literary Form or Genre**3 Credits (3)**

Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 523. Graduate Study of a Major Author**3 Credits (3)**

Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 524. Graduate Study in a Major Text**3 Credits (3)**

Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 525. Graduate Study in Comparative Literature**3 Credits (3)**

Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Repeatable under different subtitles.

Prerequisite: graduate standing or consent of instructor.

ENGL 526. Special Topics in Critical Theory**3 Credits (3)**

Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.

ENGL 527. Graduate Study in Film and Digital Media**3 Credits (3)**

Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.

ENGL 531. Technical Editing**3 Credits (3)**

Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 533. Victorian Literature**3 Credits (3)**

Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 534. Graduate Study: Form and Technique in Fiction**3 Credits (3)**

Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.

ENGL 535. Graduate Study: Form and Technique in Poetry**3 Credits (3)**

Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 12 credits.

ENGL 536. The Borderlands Writing Project**3-6 Credits (3-6)**

Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536

ENGL 542. Modern and Contemporary American Poetry**3 Credits (3)**

Studies the development of American poetry from World War I to the present. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 543. Multimedia Theory and Production**3 Credits (3)**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.

ENGL 544. Modern British Fiction**3 Credits (3)**

Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 545. Postmodern Fiction**3 Credits (3)**

Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 546. Advanced Creative Writing: Nonfiction Prose**3 Credits (3)**

This graduate-level workshop will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 446 with additional work required at the graduate level. Consent of Instructor required. Crosslisted with: ENGL 446.

ENGL 548. Graduate Study in Empirical Research**3 Credits (3)**

Introduction to empirical research methods in composition, professional communication, and rhetoric.

ENGL 549. Graduate Study in Writing**3 Credits (3)**

Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.

ENGL 550. Graduate Study in Literacy**3 Credits (3)**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.

ENGL 552. Graduate Study in History of the English Language**3 Credits (3)**

This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

ENGL 553. World Literatures**3 Credits (3)**

Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 555. Graduate Study in Rhetoric of Scientific Literature**3 Credits (3)**

Intensive study of the rhetoric of selected works of scientific literature.

ENGL 558. Latino/a Literature and Culture**3 Credits (3)**

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 560. Proposal and Grant Writing**3 Credits (3)**

Developing proposals and grants in a workshop setting.

ENGL 561. Topics in Writing Program Administration**3 Credits (3)**

Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.

ENGL 563. Graduate Study in English Literature**3 Credits (3)**

Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

ENGL 564. History and Theory of Composition Studies**3 Credits (3)**

Studies in the history and theory of composition as a discipline. Taught with ENGL 664.

ENGL 565. Intercultural Rhetoric and Professional Communication**3 Credits (3)**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.

ENGL 567. Documentary Film Theory and Criticism**3 Credits (3+3P)**

Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

ENGL 568. Rhetoric and Cultural Studies**3 Credits (3)**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.

ENGL 569. Graduate in American Literature**3 Credits (3)**

A group of works from a particular period of American literary history. Repeatable under different subtitles.

ENGL 570. Graduate Study in Approaches to Composition**3 Credits (3)**

Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.

ENGL 571. Composition Pedagogy and Practicum**3 Credits (3)**

Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.

ENGL 572. Technical-Professional Communication Pedagogies**3 Credits (3)**

Combines theoretical and practical attention to the pedagogies that underwrite the teaching of technical and professional communication; culminates in the development of a TPC course proposal, syllabus, and rationale. For Graduate students only.

Learning Outcomes

1. Engage with research and scholarship that reflects a range of approaches to conceptualize the purposes and goals of technical and professional communication courses;
2. Articulate a range of possibilities for and responsibilities of technical and professional communication pedagogy;
3. Compose and substantiate a teaching philosophy and course plan for teaching technical and professional communication.

ENGL 574. Workshop: Advanced Writing Prose**3 Credits (3)**

Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 575. Workshop: Advanced Writing Poetry**3 Credits (3)**

Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 576. Workshop: Advanced Writing Playwriting**3 Credits (3)**

Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.

ENGL 577. Workshop: Advanced Technical and Professional Writing**3 Credits (3)**

Intensive practice in technical and professional writing and editing in a workshop environment. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 578. Topics in Rhetoric and Technology**3 Credits (3)**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.

ENGL 579. Computers and Writing**3 Credits (3)**

This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 580. Graduate Problems in Creative Writing**3 Credits (3)**

Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.

ENGL 581. Women's Literature**3 Credits (3)**

Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 582. Gender and Popular Culture**3 Credits (3)**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 583. Critical Writing Studies**3 Credits (3)**

Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.

ENGL 584. Workshop: Advanced Academic Writing for International Students**3 Credits (3)**

This workshop-based course is for graduate-level multilingual writers from all disciplines who want to improve their English academic writing in an intensive and collaborative environment. Students will propose a major writing project to workshop throughout the semester, such as dissertation, thesis, comprehensive exams, etc. Some of the topics covered will be academic language, cohesion/coherence, organization, and supporting academic arguments. Other topics to be determined by needs of the class.) 4.Consent of instructor.

Prerequisite(s): 1.Be classified as a graduate student by the Graduate School 2.Be classified as an international student whose first language is not English 3.Have a major writing project in progress (comprehensive exams, thesis, dissertation, conference paper, etc.

ENGL 585. Advanced Writing Workshop: RPC Capstone**3 Credits (3)**

Students work to develop and revise their chosen Master's program Capstone Project (a portfolio, thesis or master essay) in consultation with instructor and classmates. Students provide and receive feedback on their work-in-progress. Consent of Instructor required.

ENGL 589. Cultural Studies: Literature and Theory**3 Credits (3)**

Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 590. Master's Seminar in Rhetoric**3 Credits (3)**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.

ENGL 592. Master's Theory, Practice, and Profession**3 Credits (3)**

Students will study major poetics/narratology pieces in the field and other related professional topics such as literary citizenship, publishing, and job seeking skills. Students will also propose and develop a year-long project in one of the above categories, such as a community reading or workshop, a conference panel proposal, a paper presentation, a chapbook press launch, writing/placing literary book reviews, or work on an outreach project. Must be taken in each of the last two semesters of the MFA and currently with ENGL 594 (Master's Workshop). Restricted to MFA-Creative Writing students, or by consent of instructor.

Learning Outcomes

1. Understand, analyze, and effectively use the critical discourse of poetics/narratology/craft in the field of creative writing
2. Design and execute an outreach or professional project that contributes to a creative writing community
3. Explore applications of their training in professional contexts.
4. Analyze how students' own reading, writing, and research respond to existing leadership in professional creative writing communities, help provide new leadership, and answer community needs.

ENGL 594. Master's Workshop**3 Credits (3)**

Students will submit a draft of their thesis project, in their major genre, for workshop critique. Revision of the thesis draft will be submitted to the instructor. Restricted to MFA Creative Writing students, or by consent of instructor. Must be taken in each of the last two semesters of the MFA, and concurrently with ENGL 592 (Master's Theory, Practice, and Profession).

Learning Outcomes

1. Understand, analyze, and effectively use the critical discourse of the field of creative writing to discuss a thesis.
2. Examine how their thesis operates with the genre and within the context of contemporary literature.
3. Critically contextualize their thesis and those of their peers
4. Apply various revision strategies across a thesis-length manuscript, responding to the critiques of the instructor and their peers
5. Achieve the standards of publication of the University's thesis editor and learn those of the publishing environment in their genre.

ENGL 595. Master's Workshop: Poetry**3-6 Credits (3-6)**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 596. Master's Workshop: Fiction**3-6 Credits (3)**

Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.

Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 597. Internship in Technical and Professional Communication**3-6 Credits (3-6)**

Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 598. Master's Essay**3 Credits (3)**

Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.

ENGL 599. Master's Thesis**1-15 Credits**

Thesis.

ENGL 600. Doctoral Research**1-15 Credits**

Assigns credit for research performed prior to the doctoral comprehensive examination.

ENGL 601. Qualitative Research**3 Credits (3)**

Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.

ENGL 602. Quantitative Research**3 Credits (3)**

Theory and practice of designing quantitative research studies and of collecting and analyzing data. Emphasis on quantitative methods of research in composition, professional communication, and rhetoric.

ENGL 604. Digital Research Methods**3 Credits (3)**

This course will serve as one of the core methods courses in the RPC PhD program, focusing on "digital" methods in rhetorical studies. As such, the aim of this class is to help you begin to gain confidence in conducting research in rhetoric, professional communication, and composition using digital methods. In this course we will assume that digital methods in rhetoric take broadly two forms: first, digital methods of acquisition, processing, and presentation of research data. And second, digital methods of production and circulation of rhetorical objects. The former closely resembles the methods of "digital humanities" while the latter will be closer to media archaeology and "critical making" practices. In all cases, we will relate these tools and methods to key questions and theories in our field, asking how and why we might apply digital methods in rhetorical scholarship.

Prerequisite(s): graduate standing.

ENGL 610. Proseminar in Rhetoric and Professional Communication**3 Credits (3)**

Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.

ENGL 643. Multimedia Theory and Production**3 Credits (3)**

Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.

ENGL 649. Graduate Study in Writing**3 Credits (3)**

Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.

ENGL 650. Graduate Study in Literacy**3 Credits (3)**

Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.

ENGL 661. Topics in Writing Program Administration**3 Credits (3)**

Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.

ENGL 664. History and Theory of Composition Studies**3 Credits (3)**

Studies in the history and theory of composition as a discipline. Taught with ENGL 564.

ENGL 665. Intercultural Rhetoric and Professional Communication**3 Credits (3)**

Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.

ENGL 668. Rhetoric and Cultural Studies**3 Credits (3)**

Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.

ENGL 678. Topics in Rhetoric and Technology**3 Credits (3)**

Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.

ENGL 683. Critical Writing Studies**3 Credits (3)**

This course investigates the field of Writing Studies as a distinct field of study, related to but not synonymous with Composition Studies. While debates surrounding the relationships among Writing Studies and Composition Studies flourish, this course centers on the former—investigating writing as a practice, process, and object that merits attention in its own right. Such attention will be grounded in contemporary critical and cultural theory that contests writing as a positive or neutral sign (i.e. activity theory, posthumanism, ecocriticism, new materialism, new media studies; feminist, queer, critical race or decolonial theory). Crosslisted with: ENGL 583.

Prerequisite(s): graduate standing.

ENGL 690. Doctoral Seminar in Rhetoric**3 Credits (3)**

Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.

ENGL 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

ENGR-ENGINEERING

ENGR 100G. Introduction to Engineering**3 Credits (2+3P)**

An introduction to the various engineering disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 1220G or above.

Learning Outcomes

1. Analyze the engineering road maps and have a solid curriculum plan for each semester including summers.
2. Discuss the importance of information on engineering student organizations.
3. Demonstrate an understanding of the design process from initial conception to final solution through the application of critical thinking while learning important team building skills approaches to problem solving.
4. Identify the different engineering fields, the engineering profession, career paths open to engineers, and the process to professional licensure.
5. Apply clear communication and critical thinking skills by collecting, organizing, and analyzing data in a complete, clearly written, and oral presentation of their work.
6. Make use of basic knowledge and skills in Microsoft Excel to complete engineering assignments.
7. Identify, compute, and apply how dimensions, length, time, mass, force, temperature, electric current, energy and power, and related parameters are related to the different fields of engineering.
8. recognize ethical and professional responsibilities in engineering situations and make informed judgements.

ENGR 100GH. Introduction to Engineering Honors**3 Credits (2+3P)**

An introduction to the various engineering disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities. May be repeated up to 3 credits. Crosslisted with: ENGR 100.

Prerequisite(s)/Corequisite(s): MATH 1220G or above.

Learning Outcomes

1. Analyze the engineering road maps and have a solid curriculum plan for each semester including summers.
2. Discuss the importance of information on engineering student organizations.
3. Demonstrate an understanding of the design process from initial conception to final solution through the application of critical thinking while learning important team building skills approaches to problem solving.
4. Identify the different engineering fields, the engineering profession, career paths open to engineers, and the process to professional licensure.
5. Apply clear communication and critical thinking skills by collecting, organizing, and analyzing data in a complete, clearly written, and oral presentation of their work.
6. Make use of basic knowledge and skills in Microsoft Excel to complete engineering assignments.
7. Identify, compute, and apply how dimensions, length, time, mass, force, temperature, electric current, energy and power, and related parameters are related to the different fields of engineering.
8. recognize ethical and professional responsibilities in engineering situations and make informed judgements.

ENGR 110. Introduction to Engineering Design**3 Credits (2+3P)**

Sketching and orthographic projection. Covers detail and assembly working drawings, dimensioning, tolerance specification, and design project

Learning Outcomes

1. Students will learn the fundamentals of part modeling and assemblies using modeling techniques in the SolidWorks solid modeling software.
2. They will learn how to put these parts and assemblies into production drawings using proper Geometric Dimensioning.

ENGR 111. Mathematics for Engineering Applications**3 Credits (3)**

An introduction to engineering mathematics and basic programming skills needed to perform elementary data manipulation and analysis. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): MATH 1250G. Prerequisite(s): MATH 1220G.

ENGR 120. DC Circuit Analysis**4 Credits (3+3P)**

An introduction to DC circuit analysis using Ohm's law, Kirchoff's laws, and Thevenin's and Norton's theorems.

Corequisite: MATH 1250G.

Learning Outcomes

1. Analyze and design DC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving dc circuits
3. Work and learn in teams.

ENGR 130. Digital Logic**4 Credits (3+3P)**

An introduction to logic design and the basic building blocks of digital systems. Topics include numbering systems, Boolean algebra, digital logic theory, combinational logic, sequential logic, and applications such as adders, multiplexers, encoders, counters, and registers. Includes hands-on laboratory.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Demonstrate ability to convert numerical values to the commonly used digital representations and their use for arithmetic and logical functions.
2. Formulate and solve problems related to Boolean logic functions and truth tables and using them to simplify logic expressions.
3. Formulate and solve problems related to sequential logic functions, and the ability to integrate with combinational logic to produce a simple state machine.
4. Formulate and solve problems related to common integrated circuit issues, such as logic voltage levels, propagation delay, and fan-out.

ENGR 140. Introduction to Programming and Embedded Systems**4 Credits (3+3P)**

An introduction to programming and to the field of embedded systems. Starting from the basic concepts of programming, this course uses microcontrollers, sensors, motors, and other peripheral devices to support the learning and application of the problem-solving process through embedded systems. This course focuses on reading, writing, debugging, testing, and documenting computer programs.

Prerequisite/Corequisite: E T 182 or ENGR 130.

Learning Outcomes

1. Set up and use a rich programming environment for programming
2. Employ effective use of the problem-solving process
3. Analyze existing code
4. Write, debug and test code given software requirements
5. Apply testing and documentation best practices
6. Transfer and apply programming knowledge to an Arduino-based environment

ENGR 190. Introduction to Engineering Mathematics**4 Credits (4)**

Engineering applications involving involved Math topics most heavily used in first and second-year engineering courses. Topics include engineering applications of algebra, trigonometry, vectors, complex numbers, sinusoids and signals, systems of equations and matrices, derivatives, integrals and differential equations.

Prerequisite: A grade of C- or better in MATH 1250G or higher.

Learning Outcomes

1. Ability to solve systems of linear equations by use of matrices
2. Ability to use complex numbers and periodic function to solve engineering problems
3. Ability to solve problems using various coordinate system
4. Write and Solve problems with 2-D 3D vectors
5. Write and Solve problems with derivatives
6. Write and solve problems with integrals

ENGR 198. Special Topics in Engineering**1-3 Credits**

Directed individual study of topics in engineering. Written reports covering work required. May be repeated for a maximum of 6 credits. Restricted to engineering majors. Graded S/U.

Prerequisite: consent of academic dean.

ENGR 217. Manufacturing Processes**3 Credits (3)**

An introduction to modern manufacturing processes and their application. Students will be introduced to manufacturing concepts such as traditional and non-traditional machining operations, tooling, material selection, thermal joining, geometric dimensioning & tolerancing, metrology, additive manufacturing, assembly and inspection, g-code, and automated manufacturing using CAM packages.

Prerequisite: A grade of C- or better in both, ENGR 110 and (MATH 1220G or higher).

Learning Outcomes

1. Identify the different manufacturing processes and their applications
2. Use, set up, and calibrate measuring tools.
3. Apply geometric tolerances to engineering drawings
4. Demonstrate basic knowledge of materials and material properties
5. Demonstrate basic knowledge of GM codes and their application
6. Proficiently use CAM packages such as SolidWorks CAM
7. Identify different tooling, their use, and manufacturing application

ENGR 217 L. Manufacturing Processes Lab**1 Credit (3P)**

A hands-on application of the concepts introduced in ENGR 217. This lab will expose the students to hands-on exercises and manufacturing methods used in industry.

Corequisite: ENGR 217.

Learning Outcomes

1. Understand how a product goes from design to being manufactured
2. Gain knowledge of industry tools and technology
3. Learn how to design for manufacturing
4. Engage students in critical thinking and the design process
5. Gain an appreciation for, and skills for effective communication, teamwork, ethics
6. Increase student knowledge of Geometric Dimensioning and Tolerancing (GDT)
7. Use of other tools such as drawing software, mathematics, economics, etc. knowledge of dimensions, length, time, mass, force, temperature, electric current, energy and power, and related parameters in engineering
8. Understand industry and NMSU safety practices and apply them whenever applicable.

ENGR 230. AC Circuit Analysis**4 Credits (3+3P)**

An introduction to AC circuit analysis techniques, RC/RL and RLC transients, phasors, complex power, filter response, and operational amplifiers.

Prerequisite: A grade of C- or better in both, ENGR 120 and (MATH 1440 or MATH 1521G or higher) or ENGR 190)).

Learning Outcomes

1. Analyze and design AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving ac circuits
3. Work and learn in teams.

ENGR 233. Engineering Mechanics I**3 Credits (3)**

Engineering mechanics using vector methods. Force systems, resultants, equilibrium, distributed forces, area moments, and friction.

Prerequisite: A grade of C- or better in ENGR 190 or MATH 1440 or MATH 1521G.

Prerequisite/Corequisite: PHYS 1310G or PHYS 1230G.

Learning Outcomes

1. Have an understanding of the force systems, resultants, equilibrium, distributed forces, area moments, and friction;
2. Be able to apply the acquired knowledge to formulate, solve and interpret solutions of engineering mechanics problems

ENGR 234. Engineering Mechanics II**3 Credits (3)**

Kinetics of particles, kinematics and kinetics rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies in three dimensions.

Prerequisite: A grade of C- or better in M E 236 or C E 233 or ENGR 233.

Learning Outcomes

1. Have a good understanding of the kinetics of particles, kinematics and kinetics rigid bodies, energy and momentum principles, and kinetics of rigid bodies.
2. Be able to apply the acquired knowledge to formulate, solve and interpret solutions of engineering mechanics problems

ENGR 398. Engineering Leadership Seminar**3 Credits (3)**

This course introduces students to concepts and skills related to leadership positions held at the University in the College of Engineering. The course will provide theory and practice in leadership; provide skills in effective oral communications and presentation, team building skills, and general knowledge of NMSU and the College of Engineering. May be repeated up to 18 credits. Consent of Instructor required.

ENGR 400. Special Topics**1-3 Credits (1-3)**

Directed study or project. Students must be in Junior/Senior level standing to enroll. May be repeated up to 6 credits.

Learning Outcomes

1. The Learning goals will be dependent on the what subject matter taught under the ENGR 400 course.

ENGR 401. Engineering Capstone I**3 Credits (1+6P)**

Seniors will work in teams to apply a systematic design process to real world multidisciplinary problems. Problems selected from a broad spectrum of interest areas. Students will utilize the knowledge and skills acquired in earlier course work, and incorporate appropriate engineering standards and multiple realistic constraints. Emphasis is placed on the design process, the technical aspects of the design, and the development of a prototype that meets design objectives. 1st of 2 course sequence.

Prerequisite: Grade of C- or better in (I E 316, I E 365, and I E 351) or a grade of C- or better in E E 300 or a grade of C- or better in M E 326.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ENGR 402. Engineering Capstone II**3 Credits (1+6P)**

Seniors will work in teams to apply a systematic design process to real world multidisciplinary problems. Problems are selected from a broad spectrum of interest areas. Students will utilize the knowledge and skills acquired in earlier course work, and incorporate appropriate engineering standards and multiple realistic constraints. Emphasis is placed on the design process, the technical aspects of the design, and the development of a prototype that meets design objectives. Students must be a Senior to enroll in this course.

Prerequisite: A grade of C- or better in ENGR 401.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ENTR-ENTREPRENEURSHIP AND INNOVATION

ENTR 1110. Entrepreneurship**3 Credits (3)**

Introduces students to the concept of entrepreneurship and to the process of business startups.

Prerequisite(s): BUSA 1110.

Learning Outcomes

1. Identify the unique characteristics of an entrepreneur.
2. Identify opportunities and conduct needs analysis.
3. Develop value proposition/market fit for proposed products and services.
4. Develop an appropriate business model.
5. Identify availability of necessary resources.

ENTR 331. Business Creation and Valuation**3 Credits (3)**

The course is designed to provide a first look at the entrepreneurship process by focusing how the firm will/does create value in the marketplace. As such, it is designed to integrate knowledge of business functions and apply business analysis techniques to the valuation of new ventures/entrepreneurial firms.

ENVE-ENVIRONMENTAL ENGINEERING

ENVE 450. Aquatic Chemistry**3 Credits (3)**

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on acid-base reactions, precipitation-dissolution reactions, complexation, and redox reactions. Same as ENVE 550.

Prerequisite: C E 256.

Learning Outcomes

1. Students will be able to use fundamental principles of physical chemistry as applied to acid-base, precipitation-dissolution, complexation, and redox reactions to determine the composition of waters, including natural waters and waters encountered in water and wastewater treatment processes.

ENVE 451. Unit Processes/Operation of Water Treatment**3 Credits (3)**

Theory and applications of unit processes in environmental engineering. Physical and chemical water treatment methods are emphasized.

Crosslisted with: ENVE 551.

Prerequisite: C E 356.

Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for water treatment, including sedimentation, coagulation, flocculation, filtration, and disinfection.

ENVE 452. Unit Processes/Operation of Wastewater Treatment**3 Credits (3)**

Theory and applications of unit processes in environmental engineering. Biological wastewater treatment methods are emphasized. Crosslisted with: ENVE 552.

Prerequisite: C E 356.

Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for wastewater treatment, including sedimentation, aerobic and anaerobic microbial treatment, and disinfection.

ENVE 456. Environmental Engineering Design**3 Credits (3)**

Design of chemical, physical, and biological operations and processes involved in water and wastewater treatment. Student can also be a graduate student to enroll if they have not completed C E 356.

Prerequisite: C E 356.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 459. Environmental Microbiology**3 Credits (3)**

An introduction to the diverse roles of microorganisms in natural and engineered environments. The topics include cellular architecture, energetics, and growth; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodegradation and bioremediation of contaminants. Students must be a Senior or in Graduate Standing to enroll.

Learning Outcomes

1. Students will be able to demonstrate the significance of microbial processes in natural and engineered processes.

ENVE 487. Air Pollution Control Systems Design**3 Credits (3)**

An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of air pollution control equipment. Students must be a Senior or in graduate standing to enroll.

Learning Outcomes

1. Students will be able to explain the source and nature of air pollution.
2. Students will be able to relate air pollution to regulations using a risk analysis approach.
3. Students will be able to design air pollution control systems.

ENVE 504. Advanced Environmental Engineering Design**3 Credits (3)**

Advanced engineering design covering the subject matter of the Environmental Engineering capstone undergraduate design course plus an additional report or project. May be subtitled. Consent of instructor required.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 550. Aquatic Chemistry**3 Credits (3)**

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 450.

Prerequisite(s): C E 256.

ENVE 551. Unit Processes/Operation of Water Treatment**3 Credits (3)**

Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 451.

Prerequisite(s): C E 356.

ENVE 552. Unit Processes/Operation of Wastewater Treatment**3 Credits (3)**

Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 452.

Prerequisite(s): Consent of instructor.

ENVE 556. Advanced Water Treatment and Reuse**3 Credits (3)**

Overview of both the theoretical and practical aspects of advanced water treatment technologies and water reuse applications. Basic design features of the processes are presented, with emphasis on the underlying principles, including why and how a process works, what the significant variables are, and what the limitations of the process are. Problem solving skills and technical communication skills are emphasized.

Prerequisite: ENVE 551.

Learning Outcomes

1. Students will be able to design advanced water treatment processes, including membrane filtration, electrodialysis, ion exchange, advanced oxidation, photolysis, and distillation.
2. Students will gain knowledge in water reuse applications including water quality criteria, regulations, and implementation issues.

ENVE 557. Surface Water Quality Modeling**3 Credits (3)**

Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Students must be in Graduate standing to enroll.

Learning Outcomes

1. The students will be able to use mathematical models to model the transport of constituents important for water quality, such as bacteria, viruses, nutrients, contaminants, and oxygen, in aqueous environments.

ENVE 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be repeated up to 6 credits.

ENVE 599. Master's Thesis**15 Credits**

Thesis. May be repeated for a maximum of 6 credits.

ENVE 630. Fate and Transport of Environmental Contaminants**3 Credits (3)**

Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem.

Prerequisite: ENVE 557.

Learning Outcomes

1. The students will be able to use mathematical models to model the transport of contaminants in gas, aqueous, and soil environments.

ENVS-ENVIRONMENTAL SCIENCE

ENVS 1110G. Environmental Science I**4 Credits (3+2P)**

Introduction to environmental science as related to the protection, remediation, and sustainability of land, air, water, and food resources.

Emphasis on the use of the scientific method and critical thinking skills in understanding environmental issues.

Learning Outcomes

1. Students will learn to critically analyze cause-and-effect relationships in the environment
2. Students will integrate and synthesize knowledge and draw appropriate conclusions based on the scientific method

ENVS 2111. Environmental Engineering and Science**3 Credits (3)**

Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control.

Crosslisted with: C E 256

Prerequisite: CHEM 1215G and MATH 1511G or ENGR 190.

Learning Outcomes

1. To understand the nature of water quality parameters in the context of Civil Engineering and Environmental Science (Water Treatment/Wastewater Treatment/Environmental Science)
2. To learn to apply engineering and scientific solutions to water quality problems
3. To understand environmental regulations and their consequences on the design of pollution control systems

ENVS 2111L. Environmental Science Laboratory**1 Credit (1)**

Laboratory experiments associated with the material presented in ENVS 2111. Same as C E 256 L.

Corequisite(s): ENVS 2111.

Learning Outcomes

1. List typical analyses commonly performed to evaluate physical, chemical, and microbiological parameters used to describe water quality.
2. Follow experimental procedures listed in the class laboratory manual, or other publications such as Standards Methods, to perform common water quality analyses.
3. Evaluate, analyze, and discuss experimental results and present the conclusions in the form of a professional report

ENVS 300. Special Topics**1-4 Credits**

Special subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester.

Restricted to majors.

ENVS 301. Principles of Ecology**3 Credits (3)**

A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. Crosslisted with: BIOL 301

Prerequisite(s): BIOL 2610G, A ST 311, and grade of C or better in MATH 1511G or Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1511G.

ENVS 312. Emergency Response to Hazardous Material Incidents**2 Credits (2)**

EPA approved Environmental Response Training Program Course 165.15. In compliance with OSHA 29 CFR 1910.120. Normally taken during last year of study. Same as E T 312 and WERC 312.

Prerequisite: consent of instructor.

ENVS 361. Basic Toxicology**3 Credits (3)**

Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended. Crosslisted with: TOX 361. May be repeated up to 3 credits.

Prerequisite: CHEM 1120G or CHEM 1225G and BIOL 2610G or BIOL 2110G.

Learning Outcomes

1. Learn how toxins are absorbed, distributed, metabolized, and excreted from living systems.
2. Demonstrate how metabolism can appreciably alter the toxicity of compounds as well as dictate the resultant toxicity with an emphasis on target organ(s).
3. Explain the specific mechanism(s) of actions of toxins targeting the liver, lung, kidney, and nervous systems.
4. Delineate how certain toxins induce cancer and/or promote the development of cancer.
5. Understand how and why certain plants and animals are poisonous and venomous, specifically linking discrete chemicals or complex mixtures to the resultant toxic manifestation.

ENVS 370. Environmental Soil Science**3 Credits (3)**

Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as SOIL 370.

Prerequisite: SOIL 2110.

ENVS 391. Internship**3 Credits (3)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

ENVS 422. Environmental Chemistry**3 Credits (3)**

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation.

Restricted to: Main campus only. Crosslisted with: CHEM 422

Prerequisite(s): CHEM 1225G and either CHEM 2115 or CHEM 313.

ENVS 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and SOIL 447.

ENVS 449. Special Problems**1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E S majors.

ENVS 451. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

ENVS 452. Geohydrology**4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: C E 452 and GEOL 452.

ENVS 457. Water Measurement**3 Credits (3)**

The fundamentals of measuring water will be covered. Participants will learn about measurement techniques that are used to estimate evapotranspiration as well as commonly used water measurement structures to estimate water use. The benefits and problems that are associated with using each measurement will be discussed. Students will also learn about the principles of how to use water measurement as a management tool.

Prerequisite(s): MATH 1215 or higher, or consent of Instructor.

ENVS 460. Introduction to Air Pollution**3 Credits (3)**

An introduction to the physics and chemistry of tropospheric air pollution including sources of air pollution, local and long-range transport, instrumentation, regulatory requirements, control technology.

Prerequisite(s): PHYS 1310G, CHEM 1225G, MATH 1511G.

ENVS 462. Sampling and Analysis of Environmental Contaminants**3 Credits (1+6P)**

Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. Same as ENVE 462.

Prerequisites: ENVS 2111.

ENVS 470. Environmental Impacts of Land Use and Contaminant Remediation**3 Credits (3)**

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: WSAM 470.

Prerequisite(s): ENVS 2111, ENVS 370, ENVS 452, ENVS 462.

ENVS 471. Water Quality and Geochemistry**3 Credits (3)**

We will cover the connection of water chemistry with water quality and apply geochemical modeling to practical problems. Discussions of assessment methodologies will be supported with case studies. The focus of this course is on team-based project learning. Computer software and models (mainly PHREEQC from USGS) will be used to learn analysis techniques.

Prerequisite(s): ENVS 370 or ENVS 452 or consent of instructor.

ENVS 505. Research Orientation**4 Credits (4)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, HORT 505 and SOIL 505.

ENVS 557. Water Measurement**3 Credits (3)**

The fundamentals of measuring water will be covered. Participants will learn about measurement techniques that are used to estimate evapotranspiration as well as commonly used water measurement structures to estimate water use. The benefits and problems that are associated with using each measurement will be discussed. Students will also learn about the principles of how to use water measurement as a management tool.

ENVS 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

Prerequisite(s): Master level graduate students.

ENVS 599. Master's Thesis**1-15 Credits**

Thesis Graded: Thesis/Disertation.

EPWS-ETMLGY/PLNT PTHLGY/WD SCI

EPWS 1110G. Applied Biology**3 Credits (3)**

Introduction to applied biology and ecology focusing on insects, plants and pathogens in natural areas, crops and urban settings. EPWS 1110L is strongly recommended to take in the same semester. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 1110L. Applied Biology Lab**1 Credit (1)**

Study of applied biology and ecology of insects, plants and pathogens in natural areas, crops, and urban settings. EPWS 1110 strongly recommended to take in the same semester. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

EPWS 300. Special Topics**1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

EPWS 301. Agricultural Biotechnology**3 Credits (2+2P)**

The principles of molecular biology will be introduced and used to explore the past, present, and future applications of biotechnology in agriculture. Specific topics include methodologies for making transgenic plants with increased pest resistance, the use of biotechnology in pest detection, and improving nutritional value. The laboratory will provide students with hands-on experience with equipment used for biotechnology research.

Prerequisites: CHEM 1225G, BIOL 2610G, or BIOL 2110G.

EPWS 302. General Entomology**4 Credits (4)**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 302 H. General Entomology Honors**4 Credits (4)**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insects orders and families. Laboratory focuses on identification of insect orders and families. Students in the Honors section will be given the opportunity to enhance their understanding of entomology with a more detailed examination into the lives of these fascinating organisms.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 303. Economic Entomology**3 Credits (3+2P)**

Identification and life cycles of insects of economic significance, their relationship to humans and agriculture including biological interactions and controls. May be repeated up to 3 credits.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 310. Plant Pathology**4 Credits (3+2P)**

Causes and methods of prevention and treatment of diseases in plants.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 310 H. Plant Pathology Honors**4 Credits (4)**

Cause and methods of prevention and treatment of diseases in plants. Students with an Honors designation will have additional project and report assignments.

Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 311. Introduction to Weed Science**4 Credits (3+2P)**

Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Crosslisted with: AGRO 311.

Prerequisite(s): CHEM 1215G, and BIOL 2110G.

EPWS 314. Plant Physiology**3 Credits (3)**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Same as BIOL 314.

Prerequisites: BIOL 2110G, CHEM 1225G.

EPWS 325V. Insects, Humans, and the Environment**3 Credits (3)**

Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present day, and future impacts in underdeveloped, developing, and developed civilizations.

EPWS 373. Fungal Biology**3 Credits (2+2P)**

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 373.

Prerequisites: EPWS 310 or BIOL 311, or consent of instructor.

EPWS 380V. Science & Society**3 Credits (3)**

Analysis and evaluation of how human activities affect the earth's environment or ecosystems. Several examples, from global issues to local issues will be studied in detail. Current science and the intersection of science and public policy will be discussed in relation to problems like world population, agricultural productivity, deforestation, medical advances, and future prospects for the environment. May be repeated up to 3 credits.

EPWS 390. Internship**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits. Graded S/U.

Prerequisite: consent of instructor.

EPWS 420. Environmental Behavior of Pesticides**3 Credits (3)**

Behavior of pesticide compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 447. Seminar**1 Credit (1)**

Organization and techniques for the oral presentation of research information. Restricted to: Main campus only.

EPWS 447 H. Seminar Honors**1 Credit (1)**

Organization and techniques for the oral presentation of research information. Students taking EPWS 447 H will have the additional assignment of making a poster on either scientific research or a scientific topic.

Prerequisite(s): Honors eligibility requirements.

EPWS 449. Special Problems**1-3 Credits**

Individual investigation in specific areas of entomology, plant pathology or plant physiology. Maximum of 3 credits per semester and a grand total of 6 credits.

EPWS 451. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Prerequisite: consent of instructor.

EPWS 455. Advanced Integrated Pest Management**3 Credits (3)**

Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Crosslisted with: EPWS 505.

Prerequisite(s): Either EPWS 303 or EPWS 310 or EPWS 311, or consent of instructor.

EPWS 456. Biological Control**3 Credits (3)**

Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506. Students should complete an introductory course in entomology prior to enrollment. May be repeated up to 3 credits.

EPWS 462. Parasitology**3 Credits (3)**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.

EPWS 462 L. Parasitology Lab**1 Credit (1)**

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife. May be repeated up to 1 credits.

EPWS 471. Plant Mineral Nutrition**3 Credits (3)**

Same as HORT 471 and AGRO 471.

EPWS 486. Plant Virology**3 Credits (3)**

An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.

EPWS 492. Diagnosing Plant Disorders**3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as AGRO 492 and HORT 492.

Prerequisites: EPWS 303, EPWS 310.

EPWS 502. General Entomology**4 Credits (4)**

An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.

Prerequisite(s): Either BIOL 2610G or BIOL 2110G.

EPWS 505. Advanced Integrated Pest Management**3 Credits (3)**

Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Crosslisted with: EPWS 455.

Prerequisite(s): EPWS 303 or EPWS 310 or EPWS 311 or consent of instructor.

EPWS 506. Biological Control**3 Credits (3)**

Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. An introductory course in entomology should be completed before enrollment. Credit cannot be given for both EPWS 456 and EPWS 506. May be repeated up to 3 credits.

EPWS 511. Introduction to Weed Science (f)**4 Credits (3+2P)**

Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Crosslisted with: AGRO 511.

Prerequisite(s): CHEM 1215G and BIOL 2110G.

EPWS 514. Plant Physiology**3 Credits (3)**

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development.

Prerequisite(s): BIOL 2110G, CHEM 1225G.

EPWS 520. Environmental Behavior of Pesticides (so)**3 Credits (3)**

Behavior of these compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation, overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 525. Scientific Writing- How to be a Productive and Effective Writing**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, HORT 525 and SOIL 525.

EPWS 549. Special Problems**1-4 Credits**

Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.

EPWS 551. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

EPWS 560. Ecology and Management of Invasive Plant Species
3 Credits (3)

An overview of the causes and consequences of plant invasions and invasive plant management, with a focus on critical examination of current literature and paradigms.

Learning Outcomes

1. Students will gain practical and theoretical knowledge to facilitate improved vegetation management by engaging in critical thinking and discussion on a wide variety of topics related to invasive plants.
2. Students will understand why plants invade and how to facilitate prevention of invasion in natural and rangeland areas
3. Further, students will gain knowledge of the tools and practices of invasive plant management.

EPWS 573. Fungal Biology
3 Credits (2+2P)

Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 573.

Prerequisite: EPWS 310 or consent of instructor.

EPWS 590. Graduate Seminar
1 Credit (1)

Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree.

EPWS 598. Graduate Internship
1-6 Credits

Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

EPWS 599. Master's Thesis
15 Credits
 Thesis.

FCSC-FAMILY & CONSUMER SCI

FCSC 2250. Overview of Family and Consumer Sciences Teaching
3 Credits (3)

Overview of planning and teaching skills. Supervised experiences in observing and directing the learning of secondary family and consumer sciences students. Philosophy and history of the profession.

Learning Outcomes

1. Explain the foci of FCS—past, present and future.
2. Begin to develop a professional role in FCS.
3. Formulate a personal philosophy of FCS, and of teaching.
4. Explain the teaching process.
5. Give examples of roles, responsibilities and qualities of effective and ethical teachers.
6. Assess the characteristics, backgrounds, and needs of learner audiences.
7. Explain various learning theories/principles.
8. Illustrate how various input factors influence teaching decisions.
9. Plan a researched based student-centered lesson with a learning activity in a FCS content area. 1
10. Give examples of ways to evaluate learner growth.1
11. Present a FCS content-based lesson effectively to learners using PowerPoint presentation software and a selected teaching method. 1
12. Evaluate one's own teaching and the teaching of others. 1
13. Exhibit increased confidence in one's abilities as a teacher/educator.1
14. Exhibit excitement about assuming the teacher/educator role.

FCSC 2330. Housing and Interior Design
3 Credits (3)

Investigation of types of housing and factors impacting housing decisions for families. Selection, planning, and arrangement of interior components of homes to meet the needs of the family. Restricted to Las Cruces campus only.

Learning Outcomes

1. Differentiate between different architectural designs (i.e., Cape Cod, contemporary, craftsman, ranch, southern colonial, Spanish, Victorian, pueblo, New Mexican territorial, and territorial revival) and be able to identify historical, cultural, demographic, geographical, and environmental influences on style and aesthetics.
2. Analyze the fundamentals of housing for all families and cultures and understand the role housing plays in the ecological model of human ecology.
3. Define elements of design as related to housing and interiors (i.e., color, form, line, space texture).
4. Define principles of design as related to housing and interiors (i.e., balance emphasis, harmony, proportion, unity).
5. Compare and contrast the different periods of interior design from the 20th century to the present.
6. Analyze the influence of historical and cultural factors in the development of current interior trends.
7. Select and arrange interiors that are functional and aesthetically pleasing to designated interior design situations.
8. Identify, describe and make application of textiles as related to various furniture and interior design styles.
9. Design a three-dimensional tiny house or an interior space, using all concepts learned.

FCSC 345. Management Concepts in Family and Consumer Sciences Teaching**3 Credits (3)**

Incorporation and application of management concepts in family and consumer sciences subject matter. Practical experience teaching management and ways to use management skills to plan, implement, and evaluate the teaching-learning transaction.

FCSC 348. Teaching in Informal Family and Consumer Sciences Settings**3 Credits (3)**

Learning principles and theories with application in informal family and consumer sciences education situations. Includes supervised experience in use of teaching strategies.

Prerequisite: overall GPA of at least 2.5 or consent of instructor.

FCSC 400. Research Methods in Family and Consumer Sciences**3 Credits (3)**

Introduction to research design and methodology in Family and Consumer Sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and perform basic skills including hypotheses development and conducting a literature search.

FCSC 445. Career and Technical Education Programs**3 Credits (3)**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

FCSC 446. Teaching Methods I for Family and Consumer Sciences**3 Credits (3)**

Methods and strategies for teaching Family & Consumer Sciences content in middle and secondary schools. Organization and development of curriculum. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): FCSC 2250 and FCSC 345 and an overall GPA of 2.75, admitted to FCSE program; completion of NES Essential Basic Skills Tests I, II, & III.

Corequisite(s): FCSC 445.

FCSC 447. Teaching Methods II for Family and Consumer Sciences**3 Credits (3)**

Planning, preparation, and strategies for teaching family and consumer sciences in middle and secondary schools. Preparation for employment. May be repeated up to 3 credits. Consent of Instructor required.

Restricted to: FCSE majors.

Prerequisite(s): FCSC 446; overall GPA of 2.75, admitted to program.

FCSC 448. Supervised Teaching in Family and Consumer Sciences**12 Credits (12)**

Seventy (70) days of full-time supervised teaching in selected middle or secondary schools. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: FCSE majors.

Prerequisite(s): FCSC 446, an overall GPA of 2.75, and admitted to FCSE Program.

Corequisite(s): FCSC 447.

FCSC 492. Special Problems**1-4 Credits**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

FCSC 500. Research Methods**3 Credits (3)**

This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

FCSC 545. Graduate Study in Vocational Programs for Youth and Adults**3 Credits (3)**

History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

FCSC 546. Graduate Study in Teaching Methods I**3 Credits (3)**

Objectives, content, and organization of family and consumer sciences in high schools; materials and methods of teaching. Additional assignments beyond FCSC 446 required for students registering in FCSC 546.

FCSC 547. Graduate Study in Teaching Methods II**3 Credits (3)**

Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Additional assignments beyond FCSC 447 required for students registering in FCSC 547.

FCSC 548. Graduate Study in Supervised Teaching in Family and Consumer Sciences**12 Credits (70P)**

Seventy of full-time, supervised teaching in selected schools. Additional assignments beyond FCSC 448 required for students registering in FCSC 548. Consent of Instructor required.

Prerequisite(s): FCSC 446 or FCSC 546, and consent of instructor.

FCSC 590. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

FCSC 598. Special Research Programs**1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCSC 599. Master's Thesis**1-15 Credits**

May be repeated for unlimited credit, maximum of 6 credits toward a degree.

FCST-FAMILY AND CHILD STUDIES

FCST 1130. Interpersonal Skills in Intimate Relationships

3 Credits (3)

Developing social skills within friendships, dating relationships, marriage, parenting, and families.

Learning Outcomes

1. To understand several theories that explain why some people have healthy interpersonal relationships while others do not.
2. To gain insight about one's self.
3. To learn and improve upon selected relationship skills that improve quality of life.
4. To learn skills that improve interpersonal relationships

FCST 2110. Infancy Through Middle Childhood in the Family

3 Credits (3)

This course discusses research and theory relevant to prenatal development and the physical, mental, and socio- emotional development of the child from birth through age 12. This developmental period will be examined across different cultures and in real world contexts. Attitudes, knowledge, and skills needed for working with young children and their families will be introduced. Restricted to Las Cruces campus only.

Learning Outcomes

1. Evaluate how genes and the environment interact to impact human development from prenatal stages through age twelve.
2. Assess the effects of environmental influences on the developing fetus.
3. Discuss the capacities of newborn development through age twelve.
4. Evaluate how individuals and couples change during the transition to parenthood.
5. Analyze the physical, cognitive, and social-emotional development of the child from birth through age twelve.

FCST 2135. Adolescent Development and the Family

3 Credits (3)

Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Describe the physical, cognitive, and psychosocial development of the adolescent in the family system and evaluate individual differences in development.
3. Compare and contrast ways in which culture impacts adolescent development.
4. Assess effective parenting strategies with adolescents.
5. Analyze the influence of family, peers, school, and work on adolescent development.

FCST 2140. Adult Development and Aging

3 Credits (3)

Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare and contrast theories of adult development and aging and apply theories to adult behavior.
2. Distinguish the similarities and differences of physical, emotional, cognitive, and psychosocial aspects of adult development.
3. Describe multicultural factors that impact attitudes toward aging and coping with aging family members.
4. Evaluate ways in which special issues (including but limited to Alzheimer's Disease, heart disease, end of life issues) impact aging.
5. Devise a conceptualization of one's own perspective in dealing with aging and aging family members.

FCST 301. Family Resource Management

3 Credits (3)

This course provides an understanding of the decision-making process of families concerning the utilization of financial, personal, environmental, and social resources. In particular, the class will focus on how families develop, exchange, and allocate resources throughout the lifespan with the expectation that the most effective resource management decisions are made from positions of knowledge and understanding. May be repeated up to 3 credits.

FCST 302V. Introduction to Child Advocacy

3 Credits (3)

Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

Learning Outcomes

1. To understand how to apply a model of critical thinking/analysis to child maltreatment issues using a systems framework.
2. Compare and contrast historical trends in child maltreatment and child advocacy.
3. Analyze individual, family and community risk factors for maltreatment.
4. Explain cultural issues related to assessing and working with diverse families.

FCST 380. Family Dynamics

3 Credits (3)

The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.

FCST 383. Parenting and Child Guidance

3 Credits (3)

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 401. Community Programs in Family Life**3 Credits (3)**

The purpose of this course is for students to learn through class lectures, readings, and community based activities, about issues related to the formulation, delivery, and evaluation of family life education programs in the local community and through virtual delivery. Students will also learn about conducting needs assessments in the community, and evaluating programs after their implementation in preparation for jobs in the field of Family Science.

Learning Outcomes

1. Identify conceptual frameworks suitable in the development of family life programs.
2. Demonstrate knowledge and understanding of techniques and strategies useful in the delivery of family life education programs.
3. Conduct needs assessments and critiques of existing family life/parent education programs and methods of delivering information to parents and families.
4. Apply evaluation strategies for analyzing program effectiveness.
5. Demonstrate knowledge of the legal, moral, and ethical dimensions of family life education and certification standards.

FCST 424. Field Experience: Issues and Ethics**3 Credits (3)**

Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 6 credits must be taken. Restricted to: FCS majors. Students must be in junior standing to enroll. May be repeated up to 6 credits.

Prerequisite: FCST 380 or equivalent, and an overall GPA of at least 2.5.

Learning Outcomes

1. Upon completion of this course students will be able to integrate learning into applied settings.

FCST 449V. Family Ethnicities and Subcultures**3 Credits (3)**

Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students.

FCST 456. Research Methods**3 Credits (3)**

Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Same as AXED 456.

FCST 492. Special Problems**1-4 Credits**

Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits.

FCST 510. Infancy and Early Childhood in the Family**3 Credits (3)**

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families. May be repeated up to 3 credits.

FCST 511. Middle Childhood Development in the Family**3 Credits (3)**

Research and theory relevant to the physical, mental, and socio-emotional development of children from ages five to twelve. Attitudes, knowledge, and skills needed for working with school-age children and their families. May be repeated up to 3 credits.

FCST 524. Supervised Practicum**1-9 Credits**

Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.

Prerequisite: consent of instructor.

FCST 525. Supervised Clinical Practice**1-9 Credits (2-18P)**

Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

FCST 548. Adult Development and Aging**3 Credits (3)**

Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions. May be repeated up to 3 credits.

FCST 549. Family Ethnicities and Subcultures**3 Credits (3)**

Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCST 449V plus additional work. May be repeated up to 3 credits.

FCST 562. The Business and Practice of Marriage and Family Therapy**1 Credit (1)**

This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. Graded: S/U Grading (S/U, Audit).

FCST 572. Family Dysfunction and Diagnosis**3 Credits (3)**

A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.

Prerequisite(s): Students must be enrolled in a clinical program (i.e MFT, CEP, MSW).

FCST 582. Theories of Marriage and Family Therapy**3 Credits (3)**

A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research.

FCST 583. Parenting and Child Guidance**3 Credits (3)**

Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 584. Family Law and Ethics**3 Credits (3)**

Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

FCST 585. The Family System**3 Credits (3)**

Contemporary family interaction: concepts, composition, resource and environment.

FCST 586. Sexuality and Family Dynamics**3 Credits (3)**

Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

FCST 587. Contemporary Marriage and Family Issues**3 Credits (3)**

Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

FCST 589. Family Crises and Rehabilitation**3 Credits (3)**

Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

FCST 590. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

FCST 592. Strategies in Family Therapy**3 Credits (3)**

Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers.

FCST 598. Special Research Programs**1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCST 599. Master's Thesis**15 Credits**

Thesis

FDMA-FILM & DIGITAL MEDIA ARTS

FDMA 1110. Film History**3 Credits (3)**

This course surveys the history of cinema -investigating the process by which the original "cinema of attractions" evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, and key international movements that shape it.

Learning Outcomes

1. Develop appreciation for the history of cinema.
2. Develop knowledge of the key eras in the history of US cinema.
3. Learn the characteristics of major movements in international cinema.
4. Explain technological innovations that were necessary for, and integral to, the advancement of cinema.
5. Recognize the various elements that go into telling a story in cinema.

FDMA 1120. Desktop Publishing**3 Credits (2+2P)**

This course is designed to teach introductory skills for designing and creating publications and presentations with layout software. The course will focus on graphics and typographic design, fonts, and other skills for print and web publishing.

Learning Outcomes

1. Demonstrate knowledge of fundamental features and navigation of desktop publishing software.
2. Combine text and images for effective communication.
3. Develop a balanced composition through use of color, contrast, and alignment.
4. Place images within a composition and wrap around text.
5. Produce documents with professional layout and typography skills.
6. Create attractive and effective designs.
7. Combine knowledge of typography, images, and design principles to produce professional print and web media.
8. Create or add to a professional design portfolio for future use.

FDMA 1210. Digital Video Production I**3 Credits (2+4P)**

An introduction to digital video production. Students learn camera operation, lights and audio equipment. Hands-on production is completed in the studio and on location.

Learning Outcomes

1. Plan and produce a digital video project
2. Apply post-production workflow
3. Work in team and as individual to complete digital video projects.

FDMA 1220. Introduction to Digital Video Editing**3 Credits (3)**

In this course, students learn the basics of the post-production process for non-linear video editing. Students work with multiple video formats and create short movies for multiple distribution platforms. Skills include media management and professional terminology. Sections on the Main Campus will be restricted to CMI students.

Learning Outcomes

1. Define concepts related to digital video editing.
2. Use non-linear video editing software for editing a short film
3. Enhance storytelling through the use of continuity, timing, cutaways, intercutting, compositing, transitioning, jump cutting, montaging and animating.
4. Use text, titles, transitions, video effects, sound effects, dialogue, and visual assets for digital video editing.

FDMA 1260. Introduction to Digital Media**1-3 Credits (1-3)**

Explores concepts of how text, graphics, sound, images and video come together in a digital media program and researching new trends and current issues related to media applications and design. Students will be involved in teamwork, communication and workplace interaction simulation. May be repeated up to 12 credits. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Describe and identify the principal components and terminology of digital media.
2. Analyze and examine the use of digital media as a communication tool
3. Plan and implement a digital media project
4. Critique professional digital media products.
5. Create projects using a variety of digital media tools
6. Demonstrate a working knowledge of copyright and usage rights
7. Present completed projects in a professional manner for critique.

FDMA 1360. Web Design I**3 Credits (2+2P)**

This course provides an introduction to web development techniques, theory, and design. Students will learn HTML, CSS application, and strategies for effective site navigation and design, along with industry standard web editing software to develop various websites. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): ARTS 1520 OR FDMA 1515.

Learning Outcomes

1. Acquire and utilize web design terminology.
2. Create basic web pages using HTML.
3. Demonstrate how to use industry-standard, web editing software.
4. Design professional pages that are easy to navigate and quick to load.
5. Develop a basic comprehension of CSS
6. Prepare and export a variety of graphics to be used online.
7. Compare and contrast designing for web media vs. print media.
8. Analyze the importance of web presence in today's business/social climate

FDMA 1410. Audio Production I**3 Credits (2+2P)**

Students will learn about and apply essential tools and techniques in analog and digital audio production. Topics include acoustic science, microphones, recording and mixing techniques, analog and digital audio hardware and software, including, multi-track, computer-based recording and editing systems. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Apply tools and techniques in analog and digital audio production
2. Illustrate the fundamentals of acoustic science.
3. Model professional behavior used in audio recording.

FDMA 1415. Principles of Sound**3 Credits (2+2P)**

The creation of a professional quality original media soundtrack is possible for relatively low production/post production cost. This class is designed to give the student an overview of creating sound for a variety of digital media. Topics include acoustic principles, sound design, audio hardware, recording techniques; and editing, processing, and multi-track mixing, using software applications. Restricted to: Community Colleges only.

Prerequisite(s)/Corequisite(s): FDMA 1220.

Learning Outcomes

1. Record and edit wild sound effects and synced dialogue
2. Discover, upload, and edit on-line music, ambience and sound effect loops
3. Implement audio design theories
4. Create an aesthetic soundtrack which incorporates multiple elements and dimensions
5. Design, edit, process, mix and master a synced multi-track soundtrack
6. Demonstrate capable use of digital audio production and post-production workflow
7. Produce short audio projects which meet media industry technical standards

FDMA 1510. Introduction to 3D Animation**3 Credits (3)**

This course provides an overview of 3D animation production processes. Students will be introduced to basic story development and the creation of computer-generated assets and cinematic sequences. The course will survey specialty areas of digital animation and various software and techniques applied in entertainment and information media. Students will review and critique other's animation, as well as plan and produce original animation for review by classmates and as part of a CGI demo reel.

Prerequisite(s): FDMA 2382 or FDMA 2381 or consent of instructor.

Learning Outcomes

1. Demonstrate a fundamental understanding of 3D animation history and principles.
2. Analyze animation work of other artists.
3. Appropriately utilize the various media technologies for digital 3D animation.
4. Demonstrate and apply basic techniques of digital 3D animation.
5. Demonstrate and apply basic processes of creating CGI for a narrative. 6. Apply some basic strategies for developing and creating a story visually, and create original animations.
6. Present original animations to instructor and classmates for critique.
7. Create a CGI demo reel of work completed during the course.

FDMA 1515. Introduction to Digital Image Editing - Photoshop
3 Credits (2+2P)

In this course, students will learn how to use the tools in Adobe Photoshop to create new images and edit existing images. Tools used will include selections, layers, and adjustments, among other pixel editing tools. Basic composition and output will be emphasized in all projects. May be repeated for a maximum of 6 credits.

Learning Outcomes

1. Make and refine selections
2. Adjust color and tone in an image
3. Eliminate unwanted objects in an image
4. Apply layers to organize and create effects
5. Create brushes, styles and vector shapes
6. Prepare image for print and screen output
7. Apply masking and layers to non-destructively edit an image
8. Effectively utilize blending modes and layer styles 1
9. Apply adjustment layers 1
10. Apply design principles including typography

FDMA 1531. Evolution of Electronic Games
3 Credits (2+2P)

Focus on the evolution of video games and how they have shaped mainstream entertainment. May be repeated up to 6 credits.

FDMA 1535. Introduction to Illustrator
3 Credits (2+2P)

Students receive instruction on vector graphics creation using vector illustration software. The students will create professional-quality artwork for print publishing and multimedia graphics. Instruction includes creating and manipulating basic shapes, drawing with the pen tool, using various brushes, working with type and preparing graphics for web, print, and digital publication. May be repeated for a maximum of 6 credits.

Learning Outcomes

1. Apply a variety of shape blending options
2. Create and apply new gradients
3. Apply Gradient Meshes and Envelopes
4. Create symbols, brushes and vector shapes
5. Apply Pathfinder and other effects
6. Effectively utilize the pen tool to draw and edit shapes
7. Effectively utilize Vector tools
8. Prepare image for print and screen output
9. Apply clipping masks 1
10. Prepare image for use in another program 1
11. Apply design principles including typography

FDMA 1536. Advanced Computer Illustration
3 Credits (2+2P)

Advanced techniques in 2D vector drawing and fundamentals of 3D illustration for use in print, web, and multimedia applications. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): FDMA 1535.

Learning Outcomes

1. Demonstrate proficiency in using advanced features of Illustrator.
2. Identify and create different illustrator/art styles using advanced techniques for shading, perspective, light, reflection.
3. Produce high quality digital imagery incorporating basic principles of composition.
4. Create a series of illustrations demonstrating a design competency in layout foundation and illustrative moods or client/project based solutions.
5. Create high quality portfolio pieces that demonstrate an advanced knowledge of design, composition and Illustrator techniques.
6. The students will produce finished printed portfolio pieces demonstrating a comprehensive knowledge of typographical, design, illustrative and layout skills

FDMA 1545. Introduction to Photography & Digital Imaging
3 Credits (2+2P)

This course is a study of the principles and techniques of photography using digital equipment, and discusses how digital cameras, imaging editing, and technology have changed the world of photography. Students will learn about studies in resolution, lighting, software, editing, printing, and web applications. They will gain fundamental knowledge in the rapidly expanding technology of photography and imaging, and be able to incorporate the knowledge into all areas of digital graphics.

Learning Outcomes

1. Exhibit proper usage of the principles and techniques of photography using digital equipment.
2. Utilize features and techniques of a digital camera with proper use of lenses, settings, and flashes.
3. Create photo collections that represent proper use of technical skills.
4. Demonstrate proficiency in planning, lighting, capturing, and distributing photographic projects which show ability to create photographs artistically and to tell a story or express an idea.
5. Utilize appropriate software to create original projects.
6. Demonstrate knowledge in post-production of photos as to sizing, sampling, resolution, and exporting.
7. Produce original projects which respect intellectual property of others.
8. Create a digital portfolio of work completed during the course.

FDMA 1555. Introduction to the Creative Media Industry**3 Credits (3)**

This class is an introductory course for students who are beginning their understanding of Media and how it affects them and our society. It offers a broad-stroked view of the entire industry including Marketing, Production, History, Jobs, Design, Architecture, New Media Literacy, and industry standards. Students will listen to experts in the field, get involved in open discussions about the industry and use new information to complete hands-on individual & group assignments.

Learning Outcomes

1. The basic philosophies and methods that guide people working in the Creative Media industry.
2. Knowledge of a wide variety of different jobs, qualifications and paradigms used in the industry.
3. Marketing, Production, Budgets, History, New Media, Inspiration and other aspects of the industry.
4. An accurate view of the Creative Media field.

FDMA 1630. Principles of Design**3 Credits (2+2P)**

This course will explore how we see and use visuals to communicate information. Students will develop critical thinking skills in applying concepts of basic design principles. Students will apply the concepts with hands-on and analysis assignments. These concepts will then be applied to design for advertising, print, digital media, and web design. The business of design will also be covered with emphasis on client relations and networking Restricted to: Community Colleges only. Prerequisite(s): FDMA 1535

Learning Outcomes

1. Practice Creativity
2. Plan a Design project
3. Demonstrate the effective use of Emphasis Contrast
4. Demonstrate the effective use of Balance and Alignment
5. Demonstrate the effective use of Harmony and Repetition
6. Demonstrate the effective use of Flow, Movement, and Rhythm
7. Demonstrate the effective use of Simplicity and Economy
8. Effectively apply basic color theory
9. Demonstrate the effective use of Typography principles 1
10. Apply design principles to Screen Print Projects 1
11. Develop client relations

FDMA 1710. 2D Animation**3 Credits (2+2P)**

Concepts and techniques in storyboarding and creating interactive 2D animations for web, multimedia and video.

Prerequisite(s): FDMA 1535.

Learning Outcomes

1. Be able to correctly storyboard an animation scene
2. Define and demonstrate basic animation terminology and principles.
3. Produce a complete hand drawn animation using industry standard software and processes.

FDMA 1715. 2-D Compositing & FX**3 Credits (3)**

This course will familiarize students with the process of compositing and creating special effects for animation using industry standard software. Students will learn how to assemble an animated scene and use advanced 3D lighting, spacing, and digital effects to achieve a dynamic, professionally rendered look.

Prerequisite: FDMA 2710.

Learning Outcomes

1. The goal of this class is for students to learn how to use advanced compositing and effects tools in order to achieve a more dynamic and professional visual look for their animations or motion graphics.
2. By the end of the class, you should be proficient animation compositors that can assemble and synthesize a basic animation into a rendered, visually sophisticated piece.
3. Students who pass this class will have a basic to intermediate knowledge of Adobe After Effects

FDMA 1720. 3-D Character Design**3 Credits (2+4P)**

Focus on designing a character and then taking that design and building it in 3D using intermediate modeling techniques. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 1510 or FDMA 2530.

Learning Outcomes

1. Translate concept art into a low and high resolution 3D model using proper modeling techniques
2. Use Polygon modeling techniques to create a 3D character
3. Layout UVs and utilize Adobe Photoshop to texture a model.

FDMA 1996. Selected Topics**1-4 Credits (1-4)**

Specific titles to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Varies

FDMA 2120. Film Crew I/ Introduction to Film and Media Workflow**9 Credits (9)**

An introduction to the film industry. This class teaches film production processes, film crew hierarchy, film production set-safety and etiquette and provides hands-on training in industry standard film production equipment. Students complete the semester by participating as a below-the-line crew member on a short film. Restricted to: Community Colleges only.

Learning Outcomes

1. Explain film production processes; Interpret call sheets and deal memos, model basic on-set protocols and professional behavior
2. Assist producers and directors in completing a professional film project
3. Work effectively in production crew positions in a group environment.
4. Recognize and articulate specific film production structure, from original concept to final release

FDMA 2125. Film Crew II**9 Credits (9)**

The second course designed to train students to become working members of film crews. It will be taught by working film professionals. Content will be lecture and hands-on. Students complete the semester by working as part of an actual film crew as below-the-line and above-the-line crew members. Restricted to: Community Colleges only.

Prerequisite(s): FDMA 2120.

Learning Outcomes

1. Understand film production processes used to produce a film
2. Manage craft area job functions
3. Model on-set protocols and professional behaviors
4. Assist producers and directors in completing a professional film project

FDMA 2150. Desktop Publishing II**3 Credits (2+2P)**

This class will enhance and build upon student layout/design skills developed in the Introduction to Desktop Publishing course, incorporating intermediate to advanced concepts in typography and layout design. Upon completion of this course, students will be able to use page layout software to prepare a variety of documents for presentation and critique, including newsletters, instructional flyers, and other complex design/typographic pieces. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): FDMA 1120.

Learning Outcomes

1. Build upon knowledge of design and design terminology.
2. Exhibit intermediate to advanced design principles using type, layout, and color.
3. Demonstrate skill in intermediate to advanced concepts and features of page layout software.
4. Exhibit knowledge of styles, tables, images and clipping paths and interactive documents as well as printing preparations and procedures.
5. Create layouts for print, web, and other media that demonstrate an intermediate to advanced knowledge in typography and layout design.
6. Format and produce newsletters and instructional flyers, as well as larger, complex projects such as packaging mechanicals, multiple master page documents, and books.
7. Assess works of graphic design for quality and effectiveness.
8. Utilize produced material to create or add to a design portfolio for future use.

FDMA 2210. Digital Video Production II**3 Credits (2+2P)**

Advanced techniques of the tools and application of professional film making. May be repeated for a maximum of 6 credits.

Prerequisite: FDMA 1210.

Learning Outcomes

1. Demonstrate the ability to produce and manage a video project: Produce a script, storyboard, and production schedule for a video project designed for a specific audience.
2. Demonstrate proficiency in producing quality digital video footage and audio tracks: Shoot to the script and storyboard using a variety of camera and lighting techniques; Produce a finished complex sound track including narration, music, and sound effect.
3. Demonstrate ability to produce and edit a professional quality video project: Integrate all production aspects of the project including video, audio, graphics, titles, transitions, and effects. Guide the project through the final production stages.
4. Develop competency in digital video distribution using various formats and techniques: Distribute project in various formats which could include DVD and web posting.

FDMA 2241. Advanced Camera Techniques**3 Credits (2+2P)**

Professional camera techniques and training for electronic news gathering and studio filmmaking. Utilizes high-end handheld shooting techniques, cranes, dollies, and steadicam training. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 1210.

Learning Outcomes

1. Students knowledge of high-end video camera operation and features.
2. Students must know all the working features of the video production equipment being used during the course in order to achieve the desired footage as required by the instructor.
3. Demonstrate proficiency in producing quality digital video footage.
4. Individuals must acquire the knowledge of different shooting styles in different productions situations and use those acquired skills to produce the appropriate video footage.
5. Using the proper lighting in different on location shooting styles.
6. Skill of each individual utilizing the usage of high-end camera equipment such as dollies, cranes and Steadicam.
7. Each individual must work as a team player to create professional style video footage.

FDMA 2285. Digital Video Production and Editing II**3 Credits (2+2P)**

Advanced features of digital video, audio/music, and titling production software. Included are color correction, vector scopes, motion effects, and advanced editing techniques used by filmmakers. Restricted to Community Colleges campuses only. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): FDMA 1220.

Learning Outcomes

1. intermediate to advanced video editing create short films and training videos, create TV quality commercials, direct a news broadcast, and work as a mentor to students on digital media equipment

FDMA 2287. Digital Design Studio**1-3 Credits**

A design studio environment in which students obtain real-world experience while providing service to college and non-profit associations with faculty supervision using a variety of media. Can be used with permission to fulfill cooperative requirement. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 1630 or ARTS 1712.

Learning Outcomes

1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio.

FDMA 2310. History of Cinema I**3 Credits (3)**

This course surveys the history of cinema - investigating the process by which the original "cinema of attractions" evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, as well as many key international movements that helped shape it. Restricted to: G-CMI, DFM, ANVE majors.

Learning Outcomes

1. Gain a greater appreciation for the history of cinema
2. Develop knowledge of the key eras in the history of U.S. cinema
3. Learn the characteristics of major movements in international cinema
4. Understand the various elements that go into telling a story in cinema: screenplay, narrative devices, director, producer, talent, production design, cinematography, editing, sound design
5. Learn how major genres in U.S. cinema have evolved in the past 100+ years
6. Gain a basic understanding of the operations and organization of the Hollywood film industry, from the studio system until today
7. Gain an awareness of the shifts in the film industry that present new opportunities for independent filmmakers
8. Understand the importance of learning about the history of cinema to the process of becoming a filmmaker
9. Strengthen public speaking skills

FDMA 2311. History of Animation**3 Credits (3)**

Explores the history of Animation as an art form and industry through readings, screenings, lecture and periodic guest speakers. Restricted to: G-CMI, ANVE, DFM majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. To expand your knowledge of the history of animation and its evolution to the modern day.
2. To expand your ability to view animation critically and to understand its early connections to cartooning as well as its ongoing cultural presence and relevance.
3. To expand your comfort with accessing information and completing assignments both online and independently. Canvas will be utilized for many of our readings and for some response assignments.

FDMA 2312. History of Media Design**3 Credits (3)**

An introduction to the principles of design history and theory within a chronological framework of historical and emerging media.

Learning Outcomes

1. Introduction to visual communication: Defines design media; Discuss universal design principles and strengthen student basic design skills.
2. Historical technological development and design: Prehistoric communication; Beginnings of alphabet and written language; Movable type and the printing press; Industrial revolution; Digital Age; Designers and Trends; Personalities and their influence and contributions
3. Identify design styles and discuss the relevance of how design influences: Idea generation; Trend sources; Influences or appropriation; Propaganda and advertising.

FDMA 2325. Advanced Photoshop**3 Credits (2+2P)**

This course expands on the Photoshop skill set to develop proficiency with selections, masking, channels, filters, color correction, painting tools, vector integration, video, special effects, and compositing techniques. The focus is on the core image-editing tools of Photoshop that can be universally applied to photography, print, film or the web. The material is covered in production-oriented projects and students develop work suitable for portfolios. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): FDMA 1515.

Learning Outcomes

1. Create effects using advanced blending techniques
2. Effectively utilize advanced masking techniques
3. Refine Selections with advanced techniques
4. Assess Adjust color in an image
5. Utilize advanced photo enhancement techniques
6. Alter images using Photoshop painting techniques
7. Create brush presets
8. Create vector elements with paths
9. Add manipulate type on a path 1
10. Create advanced special effects 1
11. Apply vanishing point warping 1
12. Create a video clip 1
13. Apply color adjustments to video

FDMA 2326. Digital Photography and Imaging II**3 Credits (2+2P)**

Provide understanding and skills needed for advanced digital capture, editing, optimizing and manipulating photographic images for print, web and multimedia applications. The course will prepare students to make more advanced technical and more refined aesthetic decisions relative to specific photographic applications. Restricted to: Alamogordo campus, Carlsbad campus, Dona Ana campus.

Prerequisite(s): FDMA 1545.

Learning Outcomes

1. Apply proper exposure techniques.
2. Practice effective composition techniques.
3. Demonstrate knowledge of working with Camera RAW files.
4. Demonstrate proper image adjustment and correction techniques.
5. Successfully apply the basics of HDR digital photography.
6. Apply techniques for modifying light.

FDMA 2360. Web Design II**3 Credits (2+2P)**

In this course, students will refine their skills in coding and web graphic design as well as be introduced to methods in constructing sites that adhere to the standards of responsive web design. Students will expand their knowledge of HTML and CSS using a code editor, and they will both analyze existing websites and also construct an interactive website. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): FDMA 1360.

Learning Outcomes

1. Plan and produce web design mockups.
2. Demonstrate a proficiency in HTML/CSS coding.
3. Utilize basic web scripts.
4. Integrate animation into web design.
5. Create fully functional websites using one or more web editors.
6. Make a website "live."
7. Evaluate web designs for aesthetics and functionality.
8. Demonstrate the utilization of responsive design.

FDMA 2365. Web Design for Small Business**3 Credits (2+2P)**

Technology and techniques for designing and building a web presence for small business. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): FDMA 1360.

Learning Outcomes

1. Learning advanced tools and techniques for creating and maintaining complex Business web sites. We will be using CSS, PHP, HTML, Photoshop, and Wordpress.
2. design a complete and fully functional online web business.
3. understand and develop a plan to better manage a web store/business.
4. review basic design guidelines in preparing a variety of web applications for business.
5. develop technical skills in using various web based solutions.
6. reinforce your knowledge of web design software.
7. introduce alternate sources of data, communication and financial solutions.

FDMA 2381. Storyboarding**3 Credits (3)**

Examines effective writing principles to create storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Further, the purpose of this course is to introduce students to the principles of visual storytelling—in film—through the use of the storyboard. In other words, to show how storyboards are critical "architectural component" of the filmmaking process, used as a blueprint (or guide) to communicate the complex elements of a film story. Crosslisted with: ENGL 2381. Restricted to: DFM, ANVE, G-CMI majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Learn to conceive and draw original images.
2. Learn to use images to tell a story.
3. Design, develop, and order images (shots) into storyboarded scenes.
4. Understand how storyboarded sequences are a tool in the process of filmmaking.
5. Understand how the storyboard image is translated from the written page.
6. Build scenes from the scripted sequences into a storyboard.

FDMA 2382. Principles of Story Across the Media**3 Credits (3)**

The purpose of this course is to help students understand the basic elements of narrative structure (e.g. character, dramatic conflict, theme, etc.) and how these elements may be used effectively in media expression. Crosslisted with: ENGL 2382. Restricted to: G-CMI, DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify the elements of storytelling in scripted text or improvised performance
2. Understand how these elements work together across different media
3. Apply these elements of storytelling in original work
4. Appreciate and master these elements for independent or collaborative work

FDMA 2410. Audio Production II**3 Credits (2+2P)**

Students will use skills developed in the Audio Production I course to produce audio projects utilizing a variety of analog and digital audio hardware and software, including continued use of multi-track, computer-based recording and editing systems, as well as exploring more advanced audio techniques and concepts. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Prerequisite: FDMA 1410.

Learning Outcomes

1. Apply analog and digital audio hardware and software in audio recording.
2. Apply common professional set-up practices of audio production facilities.
3. Produce audio projects, sync sound recordings, and audio dialogue replacement (ADR) demonstrating technical expertise.
4. Perform an audio mix and master for a final professional product.
5. Analyze and compare existing audio productions for quality.

FDMA 2510. Introduction to Sound Design for Film**3 Credits (3)**

This course is an introduction to the principles, techniques and applications of sound design and film scoring. Students learn how sound affects storytelling in a film, examine the role of sound from the script to screen, and the professional process of creating a soundtrack. Students learn how to use sound equipment in a production environment and execute basic techniques used to develop a soundtrack. Crosslisted with: FDMA 1415.

Prerequisite(s)/Corequisite(s): FDMA 2382. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare the properties and propagation of sound and importance of sound to the storytelling aspect of filmmaking
2. Learn the process of designing a soundtrack for film and recording live audio dialogue for use in post-production editing.
3. Learn methods of capturing sound including live audio recording, dialogue recording, foley, orchestration and audio dialogue replacement
4. Design a soundtrack for motion media project.

FDMA 2520. Introduction to Cinematography**3 Credits (3)**

The Director of Photography (or Cinematographer), in close collaboration with the Director and Production Designer, helps determine the look of a film. This course is designed to introduce students to the technical and aesthetic fundamentals of creating, developing, and collaborating on the visual elements of storytelling, using camera framing, lensing, and lighting fundamentals such as shadows, light and color. May be repeated up to 6 credits. only. **Prerequisite(s)/Corequisite(s):** FDMA 2382 (Las Cruces Campus) or FDMA 1210 (Community College Campus(es))

Learning Outcomes

1. Define and explain the fundamental concepts of cinematography, such as exposure, lighting solutions, and color temperature.
2. Understand how cinematography brings the Director's vision to reality.
3. Demonstrate proficiency in plotting and executing interior and exterior lighting solutions.

FDMA 2530. Introduction to 3D Modeling**3 Credits (3)**

This course will introduce 3D modeling methods and current practices. Students will learn preliminary and detailed modeling techniques using industry standard software. Methods will emphasize formal and functional aspects of modeling as they apply to mechanical, organic, and sculpted topology for application in animation, games, and information media. May be repeated for a maximum of 6 credits.

Learning Outcomes

1. Identify the role of a 3D modeler in a production pipeline within various fields of digital animation.
2. Apply techniques in modeling mechanical and organic objects.
3. Utilize tools available in professional 3D modeling software.
4. Create simple animations and renders.
5. Present original animations to instructor and classmates for critique.
6. Create a demo reel of work completed during the course.

FDMA 2535. Digital Illustration Techniques**3 Credits (3)**

Introductory course examining traditional artistic expressions and translating visual art experiences into a digital art medium to enhance visual storytelling. Students acquire basic principles of drawing and painting through hands-on experience manipulating tonal value, composition, form development, light and shadow, color theory, rendering realism, and graphic design. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Be familiar with the CMI computer system, facilities, equipment and policies.
2. Appropriately utilize the various media technologies available at CMI for digital illustration.
3. Understand the different roles and areas of digital illustration.
4. Understand and apply some basic techniques of digital illustration.
5. Understand and apply some basic processes of creating pleasing images based on knowledge of traditional art principles.
6. Begin to apply some basic strategies for developing and creating aesthetically pleasing images.

FDMA 2570. Creative Media Studio**3 Credits (2+2P)**

A studio environment where students specialize in creating film-festival quality and portfolio-ready projects under the supervision of faculty. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 1210 and FDMA 1220 or FDMA 2530.

Learning Outcomes

1. Students will work together to create portfolio-quality work in a studio environment.
2. Through classroom discussion and reporting the students will collaborate to produce a professional quality "vertical slice" game concept within a defined timeline and financial budget

FDMA 2710. Beginning 2-D Animation**3 Credits (3)**

Students will learn the basics of digital 2D animation by working through a variety of exercises, creating an original storyboard, and animating five or more shots utilizing industry standard software. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. The student will demonstrate an overall knowledge of computers as a tool of the animation artist and be able to produce simple animations using the techniques learned in class.
2. Use major software tools with ease
3. Manage time lines through key frames
4. Build storyboards
5. Demonstrate knowledge of 2-D and animation terminology
6. Produce actions, set environments and constraints for 2-D animation
7. Render full animation.

FDMA 2715. Special Effects**3 Credits (2+4P)**

Creating advanced virtual special effects for both rigid and soft bodies. Using MEL, dynamic principles, mixing nodes, and advanced particle systems. How to drive particles over surfaces, add texture to flow, create surface tensions, and use collision events to drive texture. Study of integrating computer-generated images with real-life video and audio.

Prerequisite(s): FDMA 2530 or FDMA 2765.

FDMA 2720. 3D Animation**3 Credits (3)**

Overview of the essentials and principles of 3D animation; creative methods for using industry standard tools to produce the illusion of movement for storytelling and creating 3D effects. Topics include, keyframe and curve animation, kinematics, cycle animation, camera animation, deformers, dynamics and constraints.

Prerequisite(s): FDMA 1510, FDMA 2710 or consent of instructor.

Learning Outcomes

1. Clearly describe the role of an animator in cinema, gaming and related fields.
2. Recognize leading animators and their methods.
3. Demonstrate knowledge of advances in contemporary animation.
4. Utilize current industry standard animation tools.
5. Apply fundamental animation processes and techniques

FDMA 2725. Rigging for 3D Animation**3 Credits (3)**

This course will introduce principles and practices of current 3D animation rigging. Students will develop fundamental methods necessary to create character rigs. Students will learn aesthetic, technical, and optimization concepts as they apply to organic and mechanical designs. Topics will include: hierarchies, constraints, deformation rigging, skeleton creation, skinning, forward and inverse kinematics, controls, body and facial rigging. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 1510.

Learning Outcomes

1. Understand what Rigging is and the role it plays in the world of cinema and video games.
2. Be familiar with industry professionals and their techniques and approaches to rigging.
3. Understand and be able to apply the fundamentals of rigging to industry standard applications.
4. Demonstrate ability to rig basic to intermediate machines, bipeds and quadrupeds

FDMA 2730. Advanced Character Animation**3 Credits (2+2P)**

Focus on complex rigging techniques as well as utilizing advanced animation functions to blend multiple animations into complex animations. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.

Prerequisite(s): FDMA 2530.

Learning Outcomes

1. Create skeletal riggings for use with a 3D model
2. Attach riggings to a 3D model using Smooth and rigid binding and refine the bindings so that they are properly weighted
3. Animate a 3D model using skeletal and vertex animation techniques

FDMA 2735. Advanced 3D Animation Workshop A**3 Credits (2+4P)**

Program capstone. Students will utilize the skills learned in the program to produce their final animation. Group integrated projects are strongly recommended to emulate a real-work animation studio environment. May be repeated for a maximum of 9 credits. Consent of instructor required.

Corequisite(s): FDMA 2740.

Learning Outcomes

1. Define the duties and skills sets required for a career in 3D Modeling.
2. Understand the Maya interface, the uses for all of the major modes and menus of the interface and be able to describe how to access the tools, actions and the options of those tools and actions.
3. Complete and compile a multi shot animated short.

FDMA 2740. Advanced 3D Animation Workshop B**3 Credits (2+4P)**

Program capstone. Students will utilize the skills learned in the program to produce their final animation. Group integrated projects are strongly recommended to emulate a real-work animation studio environment. May be repeated for a maximum of 9 credits. Consent of instructor is required.

Corequisite(s): FDMA 2735.

Learning Outcomes

1. Define the duties and skills sets required for a career in 3D Modeling.
2. Understand the Maya interface, the uses for all of the major modes and menus of the interface and be able to describe how to access the tools, actions and the options of those tools and actions.
3. Complete and compile a multi shot animated short.

FDMA 2745. Light, Shade, Render**3 Credits (3)**

This course will explore the theory and practice of 3D lighting and rendering methodologies. Techniques covered will implement cameras, lighting sources, textures, surface-mapping and algorithmic rendering to produce stylized and photo realistic images. Topics covered will include direct and indirect lighting, shaders that simulate physical substances and effects, rendering multiple passes and simulating physical lens effects. Restricted to: DFM, ANVE majors. Restricted to Las Cruces campus only.

Prerequisite: FDMA 1510 OR FDMA 2530, or Consent of Instructor.

Learning Outcomes

1. Understand the role of lighting and surfacing to tell a story.
2. Be familiar with leading lighting artist and their approaches.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental lighting and rendering techniques.
5. Demonstrate ability to create successfully rendered scenes from concept through production.

FDMA 2750. Digital Sculpting**3 Credits (3)**

Introduce students to the 3D Sculpting programs which are the industry standard sculpting programs. Students will learn how to create complex high polygon sculpts and normal maps and transfer the models into 3D studio Max and Autodesk Maya. May be repeated up to 6 credits.

Restricted to: Community Colleges only.

Prerequisite(s): FDMA 2530.

Learning Outcomes

1. Demonstrate communication skills through written critiques and explanations
2. Students will demonstrate visual communication skills through critiques, written explanations, and storyboarding
3. Demonstrate a working knowledge of Zbrush's interface
4. Demonstrate a working knowledge of Zpheres and how they are best used to create sculpts
5. Demonstrate a working knowledge of painting a mesh using Spotlight
6. Demonstrate a working knowledge of retopologizing and exporting the mesh
7. Demonstrate a working knowledge of integrating the full Zbrush pipeline into Unity and Unreal

FDMA 2755. Drawing for Animation**3 Credits (3)**

Introductory study of the human and animal form in relation to animation. Students learn fundamentals and exaggeration of the figure, as related to proportion, rhythm, mechanics, and motion. Areas of focus are: basic form, proportion, shape, contour, gesture, anatomy, portraiture, perspective, clothing effects and drawing from observation. Restricted to: CMT,DFM,ANVE majors.

Learning Outcomes

1. Students will have an opportunity to gain hands on experience using industry standard state of the art animation software.
2. Understand what the basics of drawing the human form.
3. Have a general understanding of human anatomy as needed for the artist.
4. Be able to design the human form from imagination.

FDMA 2770. Critical Game Studies**3 Credits (2+2P)**

Focus on creating a complete design document utilizing techniques and standards used in the industry today. May be repeated for up to 6 credits. Restricted to: Community Colleges only.

FDMA 2775. Game Tools and Techniques**3 Credits (2+2P)**

Focus on the different engines and gaming technologies that power the games of today. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 2770.

Learning Outcomes

1. Students will develop rapid prototyping techniques.
2. Through classroom exercises the students will gain competency in industry-standard game creation engines and tools, and learn to work together in groups to create rapid prototypes.
3. This includes creating art, sound and music, and creating basic scripts within an engine.

FDMA 2785. Level Design Concepts**3 Credits (2+2P)**

Focus on the design and creation of video game levels. Dealing with the challenges and pitfalls of different video game genres. May be repeated for a maximum of 6 credits. Prerequisite(s): FDMA 2770

Learning Outcomes

1. Students will develop level design skills.
2. Through classroom exercises the students will gain a comfortable competency with designing levels both on paper and digitally.
3. This includes creating first person shooter levels, third person levels, multiplayer level design, and more.

FDMA 2993. Workshops (Advanced Photography)**1 Credit (1)**

This is a series of 1-credit workshops offering specialized and intense advanced skill training and upgrading applications of photography for commercial purposes and training in photographic skills and styles presented by a variety of professional lecturers. May be repeated up to 7 credits. Restricted to Community Colleges only.

Prerequisite(s): FDMA 1545.

Learning Outcomes

1. Varies

FDMA 2994. Portfolio Design & Development**1-3 Credits**

Personalized design and creation of the student's professional portfolio including hard-copy, demo reel, and online. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Varies

FDMA 2995. Film Crew Cooperative Experience**3-6 Credits (3-6)**

Industry production experience in specific craft areas for film crew technicians who have successfully completed two semesters of FTTP. Restricted to: Dona Ana campus, Carlsbad campus.

Prerequisite(s): FDMA 2125.

Learning Outcomes

1. Varies

FDMA 2996. Special Topics**1-4 Credits**

Specific topics to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

Learning Outcomes

1. Varies

FDMA 2997. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with prior approval of department head. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): Minimum GPA of 3.0 and sophomore standing.

Learning Outcomes

1. Varies

FDMA 2998. Internship**1-3 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 9 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only. Consent of instructor required.

Learning Outcomes

1. Varies

FDMA 300. History of Cinema II**3 Credits (3)**

An advanced, in-depth analysis of cinema's history. Course may focus on one specific area of cinema history depending on instructor.

Prerequisite(s)/Corequisite(s): FDMA 2382, FDMA 2310. Restricted to: DFM, ANVE, G-CMI majors. Restricted to Las Cruces campus only.

FDMA 301. Sound Design II**3 Credits (3)**

Mixing and balancing dialogue, sound effects and music in postproduction. Study the role of sound effects, foley, soundtrack choices, and music supervision. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2510.

FDMA 303. Cinema Review and Critique**3 Credits (3)**

This course is for the student who wants to learn to be a more active, intelligent film viewer. It encourages critical thinking about films and educates students on how to write a film review. Students will meet in the movie theater to watch essential films that serious movie watchers should see from classic motion pictures, to current release major motion pictures, independent films and world cinema features. The course will serve as a guide to the illuminating process of evaluating, analyzing, and reviewing movies. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2382.

FDMA 304. Independent Filmmaking**3 Credits (3)**

This course is designed to enhance student knowledge about independent film in the U.S. Through a series of screenings, readings and lectures, students will learn how to take an idea, obtain the script, create a budget, finance the project, direct the shoot, edit the film, attend festivals, secure an agent, and then market, sell and distribute around the world. Students will gain an appreciation of the history of American independent filmmaking. Students will apply this knowledge in their written assignments, and a critical comparative essay. Restricted to ANVE, DFM Majors.

Learning Outcomes

1. Students will acquire greater proficiency in independent filmmaking and planning.
2. Students will gain an understanding of the history of independent filmmaking and where the industry stands today.
3. Students will improve their ability to write about film in an organized, articulate, and effective manner.
4. Students will hone critical thinking skills by engaging in comparative analysis of independent films.

FDMA 305. Business of Filmmaking/Animation**3 Credits (3)**

Explores the roles of unions, basic contracts, legal arrangements, and the economics of the production process, distribution, and financing. Consent of Instructor required.

Prerequisite(s): FDMA 2382.

FDMA 307. Writing for Television**3 Credits (3)**

Students will examine and apply various strategies of storytelling, narrative structure and its principle components as they relate to a wide cross-section of television platforms, genres and formats. Restricted to ANVE, DFM Majors.

Prerequisite: FDMA 2382.

Learning Outcomes

1. By the end of this course, students should be able to identify the building blocks of storytelling, including conflict, structure, plot, theme, character, and point of view.
2. By the end of this course, students should be able to understand how these building blocks work together to effectively communicate in all types of scripted television, including streaming platforms such as Amazon and Netflix.
3. By the end of this course, students should be able to have a better understanding and mastery of writing mechanics.
4. By the end of this course, students should be able to present a verbal and written pitch for an original TV series and one cold open.

FDMA 308. Writing for Animation**3 Credits (3)**

This class explores methods for, and approaches to, writing for animation. Students study and produce scripts for a range of animation outlets while engaging in writing exercises based on character and story development.

Prerequisite(s): FDMA 2382 or consent of instructor.

FDMA 309. Screenwriting I**3 Credits (3)**

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Crosslisted with: ENGL 309 and THEA 306.

Prerequisite(s): ENGL 2382/FDMA 2382 or consent of instructor.

FDMA 310. Cinematography II**3 Credits (3)**

Advanced tools of the cinematographer, lighting and composition techniques. Artistic and technological elements of cinematography. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2520.

FDMA 311. Editing II**3 Credits (3)**

Advanced techniques in digital films using professional non-linear editing systems. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 1220.

FDMA 312. Post Production Color Grading**3 Credits (3)**

Color grading is an important part of the overall look of a film. It used to be a craft that only a small number of people knew how to do. However, due to advances in technology and business models, more and more people are diving into color grading. This class is an introductory look into the art and techniques of color grading. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 1220.

FDMA 314. Acting for Film**3 Credits (3)**

Techniques for film and television acting. In-depth analysis of film performance creation among actor, director, writer, cinematographer, and editor. Restricted to: THTR,DFM majors.

Prerequisite(s): FDMA 2382.

FDMA 315. Adventures in Genre**3 Credits (3)**

Students learn storytelling strategies for the screen by studying various structural genres and components of screenplays and films. Utilizing these strategies, students develop a number of their own original screenplay ideas. Additionally, pitch workshops are held and students learn to present their ideas in various, practical situations.

Prerequisite(s): FDMA 2382 and FDMA 309.

FDMA 316. Border Cinema Around the World**3 Credits (3)**

What is the relationship between borders, identity, and vulnerability - and how is this relationship explored in cinema? How are borderlands also testing grounds - the sites of serious ethical dilemmas? By examining powerful feature films from such regions as the Middle East, the Balkans, and the US/Mexico border, we will explore ways in which personal, familial, communal, and national identities are defined through the complex process of bordering. We will investigate the role of cinema in reflecting and/or facilitating this process.

FDMA 318. Documentary Production**3 Credits (3)**

Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.

Prerequisite(s): FDMA 1220, FDMA 2520.

FDMA 320. Race and Gender in Film**3 Credits (3)**

In this course students will analyze film as an art form as well as be exposed to Race and Gender Feminist Film Theory. We will consider the role of film in our understandings of sex, gender and sexuality. Through discussions and writing we will work to discern relevant social, political, ideological, and aesthetic concepts in the media we examine. Crosslisted with: ENGL 399, GNDR 450 and GNDR 550.

FDMA 325. Film Festival Production**3 Credits (3)**

A course for students interested in learning about the processes of orchestrating an independent film festival. Students will engage in a professional environment with other film students and filmmakers, as well as learn about film event administration and organization. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

FDMA 327. 2D Rigging**3 Credits (3)**

This course will introduce industry-standard 2D rigging principles and practices. Using node-based technology, students will learn aesthetic and technical concepts of 2D rigging to build a variety of fully functional, 360-degree 2D rigs of their own designs. Topics include: vector-based art, node structures and groups, articulation points, deformations, drawing substitutions, and master controllers for efficient animation. Restricted to ANVE Majors.

Prerequisite: FDMA 2710.

Prerequisite/Corequisite: FDMA 2755.

Learning Outcomes

1. Students will learn how to use drawing and rigging tools in Toon Boom Harmony Premium to create strong character designs and functional 2D rigs.
2. By the end of the class, students should be proficient rigging artists who can design a character and assemble a 2D rig for that character, as well as animate the character rig.

FDMA 328. Producing**3 Credits (3)**

Examines the role of the Producer, essential to every film production. The course will revolve around the best practices in organizational design, the production process, the budgeting process, financial controls, scheduling, insurance and distribution.

Prerequisite(s)/Corequisite(s): FDMA 2510, FDMA 1220, FDMA 2382.

Restricted to: ANVE,DFM majors.

FDMA 332. 3D Character Animation**3 Credits (3)**

Essentials and principles of 3D character animation. Techniques and craft of breathing life into characters through movement, including dynamic poses, blocking action, run and walk cycles, lip synching and realism. Students will plan and produce original animation for review by classmates and as part of a CGI demo reel. THEA 1221, Acting and FDMA 2510, Sound Design are recommended. Restricted to: DFM,ANVE majors.

Prerequisite: THEA 1210 (or FDMA 314 or FDMA 348), FDMA 1510 and FDMA 2720 or consent of instructor.

Learning Outcomes

1. Understand the character animation pipeline.
2. Understand basic body mechanics and how to represent them with a 3D character
3. Understand the twelve principles of animation on a deeper level and be able to apply them in individual work
4. Developing a vocabulary and critical eye in order to critique each other's work.

FDMA 341. Visual Effects I**3 Credits (3)**

This course will educate students on the fundamental principles, skills, and artistry needed to successfully integrate live action footage and computer generated imagery into technically correct and narrative engaging cinematic shots. Topics include: Cinematography for visual effects; Green screen setup/lighting/keying; Intermediate compositing techniques; Editing, color correction and grading. Restricted to ANVE, DFM Majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530, FDMA 2745 (or consent of instructor).

Learning Outcomes

1. At the end of this class, students will produce (alone or in a group), an engaging, well-thought out and professionally executed visual story from scratch - using a combination of live action plates, green screen elements and seamlessly integrated CGI elements.
2. Students will become fluent in setting up and operating a professional camera proper cinematography techniques.
3. Students will shoot green screen elements/plate using proper cinematography techniques.
4. Students will become fluent in editing software to edit an engaging narrative.
5. Students will become fluent in node-based compositing software to produce seamless, photoreal integrations of CGI elements and green screen mattes in live action plates.
6. Students will use color-correction and color grading techniques and use color as a narrative element.
7. Students will correctly adhere to established production standards and protocols.

FDMA 348. Acting for Animation**3 Credits (3)**

This course explores performance techniques relevant to animators including 2D and 3D animation and motion capture. Students learn to create dynamic, dramatic performances and believable character interactions for animation based reference. Students learn to analyze scripts, sound, acting, action and performance for production. Topics include: acting theory, emotional/mental states, character movement and style, dynamic facial expression, scene construction, posing, layering and rhythm, simplification and exaggeration, and lip sync. Restricted to: ANVE,DFM majors. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the different roles and character mindsets of digital animation in cinema.
2. Understand and apply some basic acting skills into animation reference.
3. Understand and apply some basic processes of creating reference for a narrative.
4. Begin to apply some basic strategies for developing and creating a story visually.

FDMA 350. Intermediate 2D Animation**3 Credits (3)**

Students will begin to refine their animation skills by animating more complex characters utilizing the Principles of Animation. They will practice these advanced drawing and motion techniques in a variety of exercises and projects using industry standard software. Areas of focus include: squash and stretch, cloth simulation, the successive breaking of joints, and biped walk cycles. May be repeated up to 3 credits.

Prerequisite: FDMA 2710.

Learning Outcomes

1. Students will refine foundational animation skills.
2. Students will learn and show proficiency in related industry-standard software.
3. Students will apply skills to more advanced projects than in previous 2D courses

FDMA 360. Previsualization**3 Credits (3)**

Implements 3D animation tools in preproduction shot and sequence design for motion picture and broadcast industries; including 3D storyboarding, technical planning and editing basics. LC Campus Only. Restricted to ANVE, DFM majors.

Prerequisite(s): FDMA 1510, FDMA 2530, and FDMA 2720 or consent of instructor.

FDMA 362. Motion Graphics**3 Credits (3)**

Students will learn the industry standard motion graphics techniques through a variety of exercises and projects that combine animation, text, visual effects, and sound. Restricted to: ANVE, DFM majors.

Prerequisite: FDMA 1715.

Learning Outcomes

1. Understand the context for and learn to create, combine, and animate text with graphics.
2. Explore various applications of creative techniques, including motion graphic design for commercials, logos, informative videos, UI design, and basic character rigging.
3. Learn to use industry-standard motion graphic softwares.

FDMA 365. Character Design and Development**3 Credits (3)**

Digital character design for the entertainment industry. Provides insight into the process of creating iconic characters. Traditional and contemporary character designers are explored. Industry workflow is introduced and necessary skills are developed to design detailed 3D characters from concept through production. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530 and FDMA 2535, or consent of instructor.

Learning Outcomes

1. Understand the role of a character in cinema and gaming.
2. Become familiar with leading character designers and their approach.
3. Utilize current industry standard methods.
4. Understand and apply fundamental character design techniques.
5. Demonstrate a strong ability to design and create characters from concept through production.

FDMA 377. Game Design Workshop**3 Credits (3)**

In this course we will learn to design, develop, and playtest games. This approach will be exercise driven and involve nontechnical approaches as well as digital production techniques. This playcentric approach will involve player participation from conception through production. We will explore the iterative processes of prototyping, playtesting, and revising based on feedback. Consent of Instructor required. Restricted to: ANVE, DFM majors.

FDMA 395. Directing I**3 Credits (3)**

Study and application through short scene work of the basic tools of a director and relationships with actors, designers, playwright, and stage managers. Interpreting as well as organizing. May be repeated up to 3 credits. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 2510, AND FDMA 2520, AND FDMA 1220.

FDMA 396. Directing II**3 Credits (3)**

Addresses pre-production concerns including script breakdown, casting ground plans and coverage. The criteria employed when selecting the creative team including a director of photography, art director, light, sound and wardrobe designers. Introduction to budgeting, scheduling, and script breakdowns. Prerequisite: FDMA 395

FDMA 397. Practicum**1-3 Credits (1-3)**

Practical application of the student's field of study in a project environment. May be repeated up to 9 credits. Consent of Instructor required.

FDMA 398. Special Topics**3 Credits (3)**

This course addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. May be repeated up to 12 credits.

FDMA 400. Directed Studies**1-6 Credits (1-6)**

Directed study course in CMI under the supervision of a CMI faculty member. May be repeated up to 9 credits.

FDMA 401. Motion Capture Techniques**3 Credits (3)**

Students will implement industry standard motion capture techniques and essential skills to capture and integrate performance for movie making, 3D animation and game production. Students will learn how to use the motion capture system, equipment and workflow, and polish performances using industry standard software. Concepts covered will consist of exploring motion capture setup, shooting, data tracking, and animation correction and enhancement. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2720 and FDMA 2725 (or consent of instructor).

Learning Outcomes

1. Understand and demonstrate basic approaches to integrating live actors with computer generated imagery.
2. Understand the role of motion capture in cinema, advertising and related fields.
3. Build familiarity with leading motion capture companies and their approaches.
4. Become knowledgeable of the history of motion capture.
5. Become knowledgeable of current advances in motion capture.
6. Learn to utilize industry standard motion capture software.
7. Demonstrate a strong ability to produce believable imagery from concept through final production.

FDMA 410. Cinematography III**3 Credits (3)**

This class is geared towards those who want to learn more about cinematography, color grading, and digital technology as it pertains to cinematography. Shooting high-end codecs (ProRes/DNxHD) or RAW are becoming more and more popular in filmmaking as camera manufactures and computer processing get better. This class will be a mix of production and post-production as learning how to shoot these higher end codecs do not end with the camera. Focus will be on techniques of shooting raw, understanding how to operate a camera capable of high end image acquisition, properly building up the camera rig and accessories, managing data and the post-production workflow. Consent of Instructor required. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 310.

FDMA 412. Advanced Equipment Training**3 Credits (3)**

This class is designed for students who want to dive deep into building and operating much of our advanced camera and G&E equipment. Though these on-set tasks are performed by below-the-line crew members, having the knowledge of and ability to use this equipment will serve you greatly as a DP. We will go over a wide variety of devices in this class, ranging from car mounts and our GlideCam to our large jib, 3-axis gimbal, 500-amp generator, and 6K HMI lights. We will also do some advanced lighting scenarios. The goal of this class is to get you "certified" on all the above items, resulting in your being able to build this equipment for other CMI sets, such as the Mixed Class Productions, Senior Projects, etc. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 310.

FDMA 422. Environmental Filmmaking**3 Credits (3)**

As a documentary workshop in social-impact filmmaking, this course focuses on the transformative power of visual storytelling to address the pressing environmental issues of our times. Students will watch a variety of environmental films, and make their own short documentary and media projects, telling solutions-oriented stories about environmental issues. This course is designed to give students the opportunity to collaborate with environmental NGOs, foundations, and NMSU faculty and students in other departments working on environmental issues in the Southwest and Borderlands region. By harnessing the power of visual storytelling to address the pressing challenges of our times, students will be empowered to become content creators and change makers having impact in the world. Restricted to DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1220, FDMA 2510, FDMA 2520.

Learning Outcomes

1. To understand the basic elements of the climate crisis.
2. To explore the power of visual storytelling to address pressing environmental issues.
3. To learn basic strategies used by filmmakers to create social impact films, including calls to action.
4. To study effective case-studies of impact documentaries exploring climate issues, oceans/ivers, energy policy and the extinction crisis.
5. To give comparative presentations that connect films screened outside of the class with films watched in class.
6. To explore the ethics of documentary filmmaking.
7. To identify and build relationships with local non-profits and researchers working on environmental issues in the region.
8. To learn industry-standard documentary research and interview skills.
9. To produce, film and edit (in teams) a short impact documentary about selected subjects.

FDMA 425. Film Festival Production**3 Credits (3)**

This course is designed to enhance student knowledge about film festivals and, specifically, the Las Cruces International Film Festival. From soup to nuts, students will build upon what they learned in CMI 325 Film Festival Preparation regarding how to manage and execute a major film festival, including film solicitation and submissions, festival event marketing, celebrity appearances, industry workshops, filmmaker coordination and brand management. Students will gain an appreciation of the value of a film festival to the community and for visiting filmmakers. Students will apply this knowledge in their written assignments, film evaluations, and departmental responsibilities. May be repeated up to 6 credits. Restricted to: DFM, ANVE majors.

Prerequisite(s): FDMA 325.

FDMA 433. Sets and Environments**3 Credits (3)**

Digital environment design and creation for movies and games from concept to production; including illustration, modeling, matte painting, texturing, lighting, rendering, integration, and camera projection. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530, and FDMA 2535 or consent of instructor.

Learning Outcomes

1. Understand the role of digital production design in cinema.
2. Become familiar with the work of leading digital artists involved in production design for the entertainment and gaming industries.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental digital set design techniques.
5. Demonstrate a strong ability to design and create digital set and environments from concept through production.

FDMA 450. Advanced 2D Animation**3 Credits (3)**

This course will cover the more advanced aspects of 2D Animation. Students will demonstrate their mastery of the principles of animation through a variety of exercises and projects focusing on: automated and manual lip sync, full motion character animation, acting, smears, and quadruped animation. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 350.

Learning Outcomes

1. Students will gain experience mastering Disney's Principles of animation.
2. Students will complete exercises to animate both humans and animals.
3. Students will gain proficiency in lip syncing and acting using industry standard software.

FDMA 451. Dynamics and Effects**3 Credits (3)**

This course educates students in photoreal 3D simulation techniques focusing on particle simulations, rigid body dynamics and fluid simulations. Students will complete several professional grade VFX shots involving explosions, fire, destruction, dust and debris.

Prerequisite: FDMA 1510.

Learning Outcomes

1. Students will exhibit high level competency in critical thinking and independent problem solving.
2. Students will understand and apply procedural methodologies; and complete several professional quality, portfolio-ready simulation shots using industry-standard techniques.
3. Students will produce work at a pace to meet with the production schedule.
4. Students will implement critiques on their work-in-progress to iteratively improve production quality.

FDMA 477. Digital Game Design**3 Credits (3)**

This course covers the theory and practice of digital game production using industry standard media and game engine applications. Students apply animation and game development approaches toward game engine constraints and requirements to create gameplay experiences. Design and production methods are implemented to create game levels and populate them with original assets. Team based game prototyping will require multiple disciplines to devise unique digital game experiences. Consent of Instructor required. Restricted to: ANVE, DFM majors.

Prerequisite(s): FDMA 377.

FDMA 480. Screenwriting II**3 Credits (3)**

Students will write 2 short scripts, 10-15 pages each throughout the semester. Focus will be on learning how to take notes and rewrite. Script analysis will be in a workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. Restricted to ENGL, DFM, ANVE majors. Crosslisted with: ENGL 480

Prerequisite(s): ENGL 309 or FDMA 309 or THEA 306 or consent of instructor.

FDMA 490. Advanced Screenwriting**3 Credits (3)**

Students will prepare a 30-60 page screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. This course is aimed at preparing writers for the professional market. Consent of instructor required. May be repeated up to 6 credits.

FDMA 491. 3D Production Studio I**6 Credits (6)**

The course is the first semester of a year-long effort to complete a culminating project that is a story-driven short film, which can be either full CGI, or live action with visual effects. In Production Studio I the emphasis will be on the pre-production phase, including analysis and critique, pipeline organization and project management. Pre-production consists of: Pitch, Script, Visual and sound references, Storyboards, 3D Previsualization, Scheduling/Project Management. Restricted to ANVE majors.

Prerequisite: FDMA 308 or FDMA 309, FDMA 341.

Prerequisite/Corequisite: FDMA 332, FDMA 360, FDMA 365, FDMA 433.

Learning Outcomes

1. Demonstrate an ability to create a transformational story.
2. Exhibit proficiency in visual storytelling, structure, and character development.
3. Develop a story appropriate to the chosen production approach.
4. Create storyboards/animations to direct the cinematic aspects of the story.
5. Design the production visually in terms of characters and environment.
6. Learn to implement critiques of work to improve production quality.

FDMA 492. 2D Production Studio I**6 Credits (6)**

Students will work through the pre-production process on short animated films. They will write a script, create a storyboard, and record voice over/ dialogue to create an animatic. Additional exercises will then be assigned to augment the skill set of the student according to the needs of each student. Restricted to ANVE majors.

Prerequisite: FDMA 1715 and FDMA 450.

Learning Outcomes

1. Students will synthesize animation techniques to produce a completed animatic.
2. Students will show proficiency in storytelling towards the development of a short script for production.
3. Students will demonstrate proficiency in industry standard animation softwares and production practices.

FDMA 493. 3D Production Studio II**6 Credits (6)**

The course is the final semester of a year-long concentration on a culminating project. Emphasis will be on the production, post-production, and distribution of the work created during 3D Production Studio I. Students will produce a professional quality and industry-standard visual story that will help them gain entry into professional employment. The overall objective is for students to execute their artistic vision with exceptional creative and technical proficiency - resulting in a story-driven and captivating cinematic experience. Restricted to ANVE majors.

Prerequisite: FDMA 491.

Learning Outcomes

1. Students will complete the process of transforming their story from script to screen.
2. Students will demonstrate mastery of craft as a digital artist.
3. Students will learn to direct the cinematic aspects of the story.
4. Students will show proficiency in the production workflow, and complete a deliverable short film by the end of the production schedule.

FDMA 494. 2D Production Studio II**6 Credits (6)**

Students will produce the short animated films they developed in 2D Production Studio I. They will animate, composite, and edit their shorts into a final piece for presentation in a showcase. Restricted to ANVE majors.

Prerequisite: FDMA 492.

Learning Outcomes

1. To complete a final project (either short film or demo reel) that demonstrates synthesis of animation techniques taught in earlier classes.
2. To translate animatics from 2D Production Studio I into keyframes and then in-between their keyframes to get clean, smooth animations.

FDMA 495. Internship**1-12 Credits (1-12)**

Placement in a production facility and supervised experience required. With CMI advisor approval only. May be repeated up to 18 credits. Consent of Instructor required. Restricted to: DFM, ANVE majors.

FDMA 497. Portfolio Design and Development**3 Credits (3)**

Advanced graphic design projects with an emphasis on conceptual development, portfolio preparation, and professional practices. Refine general marketing strategies, personal portfolio, and resumes. Define, target, and penetrate personal target markets. Students develop individual promotional/demo packages. Restricted to: DFM, ANVE majors.

FDMA 500. Graduate Problems in Creative Media**1-3 Credits (1-3)**

Independent study in an area of Creative Media. The curriculum will be designed by the student taking the course with consultation from the assigned instructor. Consent of instructor required. May be repeated up to 9 credits.

Learning Outcomes

1. Student will outline an idea for a project or research study, including a timeline for various milestone completion.
2. Student will work with a faculty member to determine the final deliverable outcome, adjusting the timeline and finalized expectations as needed throughout the semester.

FDMA 501. Special Topics**3 Credits (3)**

This course is a graduate-level course that addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. This class may be cross listed with FDMA 398 Special Topics, or another FDMA course, and if so, graduate students will be expected to perform extra work or complete longer assignments. May be repeated up to 9 credits.

Learning Outcomes

1. The learning objectives will depend on the subject matter being covered in the special topics class, and may include completion of a creative work or research in an area of creative media.

FIRE-FIRE INVESTIGATION

FIRE 101. Firefighter I**8 Credits (6+6P)**

This course will train the student to the Firefighter I level as outlined in NFPA 1001, Standard for Firefighter Professional Qualifications. Firefighter I certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 8 credits. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): OEEM 103 and FIRE 115. Restricted to Community Colleges campuses only.

FIRE 102. Fire Fighter I and II**12 Credits (12)**

This course will train the student as outlined in NFPA 1001, Fire Fighter Professional Qualifications. Firefighter I & II Certification issued through the New Mexico Firefighter's Training Academy (NMFTA) upon successful completion [International Fire Service Accreditation Congress (IFSAC) & Pro Board accredited]. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): FIRE 115, FIRE 252, OEEM 103. Restricted to Dona Ana campus only.

FIRE 104. Firefighter II**8 Credits (6+6P)**

This course will train the student to the Firefighter II level as outlined in NFPA 1001, Standard for Firefighter Professional Qualifications. Firefighter II certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 8 credits. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): FIRE 252. Prerequisite(s): FIRE 101. Restricted to Community Colleges campuses only.

FIRE 112. Principles of Emergency Services**3 Credits (3)**

This course provides an overview to fire protection and emergency services including career opportunities in fire protection and related fields. The organization and function of public and private fire protection services is studied including how fire departments fit as part of local government. An overview of laws and regulations affecting the fire service is explored along with specific fire protection functions and responsibilities including basic fire chemistry and physics, introduction to fire strategy and tactics and life safety initiatives. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

FIRE 114. Fire Behavior and Combustion**3 Credits (3)**

This course explores the theories and fundamentals of how and why fires start, spread, and are controlled. Restricted to: Community colleges only.

FIRE 115. Hazardous Materials Awareness and Operations**3 Credits (3)**

This course will train the student to the Hazardous Materials Awareness and Operations level as outlined in NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents and OSHA 29 CFR 1910.120. Hazardous Materials Awareness and Operations certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

FIRE 120. Fire Protection Hydraulics and Water Supply**3 Credits (3)**

This course will train students on skill requirements for becoming a safe and effective fire apparatus driver/operator. The focus will be on pump operation, construction, testing, and mathematical calculation required for effective pump operation and fire control. Responsibilities of the driver/operator will be taught and assessed consistent with applicable NFPA standards and the New Mexico Firefighters' Training Academy (NMFTA) guidelines. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the NMFTA. Consent of Instructor required. Restricted to Community Colleges campuses

Prerequisite(s)/Corequisite(s): FIRE 128.

FIRE 126. Fire Prevention**3 Credits (3)**

This course will educate students about the principles and techniques of fire prevention and life-safety inspection and code compliance in accordance to NFPA 1031, Standard for Professional Qualifications for Fire Inspector and Plan Examiner, Level I. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the New Mexico Firefighters' Training Academy (NMFTA). Restricted to Community Colleges campuses only.

FIRE 128. Apparatus and Equipment**2 Credits (2)**

The course will train students on attitude and skill requirements for becoming a safe and effective fire apparatus driver/operator. The focus will be on apparatus inspection, operation, maintenance, and specification. Responsibilities of the driver/operator will be taught and assessed consistent with applicable NFPA standards and the New Mexico Firefighters' Training Academy (NMFTA) guidelines. Students pursuing certification must possess a current and valid New Mexico driver's license. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the NMFTA. Restricted to Community Colleges campuses only.

FIRE 130. Principles of Fire and Emergency Services Safety and Survival**3 Credits (3)**

This course introduces the basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavior change throughout the emergency services. Consent of instructor required. Restricted to: Community colleges only.

FIRE 200. Special Topics**1-12 Credits (1-12)**

Specific subjects to be announced in the Schedule of Classes. Course may be repeated for credit as topics change. May be repeated up to 12 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

FIRE 201. Independent Study**1-3 Credits**

Research on an approved topic to meet graduation requirements. Meets or exceeds NFPA standards. May be repeated for total of 9 credits.

Prerequisite: consent of instructor.

FIRE 203. Fire and Emergency Services Administration**3 Credits (3)**

This course will provide students entry-level training in company operations and administration at the first-line supervisory level. The student will learn how to effectively manage human resources and community/public relations. Students will learn about fire department organization and administration; including budgets, reports, and planning. Students will learn the process involved in fire inspection, investigation, public education, emergency service delivery, and safety, per NFPA Standard 1021, Fire Officer Professional Qualifications. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

FIRE 210. Building Construction for Fire Protection**3 Credits (3)**

This course provides the components of building construction related to firefighter and life safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies. Restricted to: Community colleges only.

FIRE 220. Cooperative Experience I**1-3 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and rated by the employer and instructor. May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of instructor.

FIRE 221. Cooperative Experience II**3 Credits (3)**

Apply advanced firefighting knowledge and skills while working with fire protection agencies. Meets or exceeds NFPA standards. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.

Prerequisite(s): FIRE 220.

FIRE 223. Fire Investigations I**3 Credits (3)**

This course meets the requirements set forth in NFPA 1033 Professional Qualifications for Fire Investigator. This course will give a comprehensive understanding of the principles of fire investigation, scene examination, documentation, evidence collection/preservation, interview techniques, and post-incident investigations. Student who meet all course requirements are eligible for International Fire Service Accreditation Congress (IFSAC) certification through New Mexico Firefighters' Training Academy (NMFTA). Restricted to Community Colleges campuses only.

FIRE 224. Strategy and Tactics**3 Credits (3)**

Provides an in-depth analysis of the principles of fire control through utilization of personnel, equipment and extinguishing agents on the fire ground. Covers the development of systematic action plans for emergency situations. Includes recognizing and prioritizing emergency scene needs and developing related strategies, tactics and contingencies. Educates students on how resources should be deployed to implement those plans. Restricted to Community Colleges campuses only.

FIRE 225. Fire Protection Systems**3 Credits (3)**

This course provides information relating to the features and design and operation of fire alarm systems, water-based fire suppression systems, special hazard fire suppression systems, water supply for fire protection and portable fire extinguishers. Restricted to: Community colleges only.

FIRE 230. Fire Service Instructor**3 Credits (3)**

Provides the instructor candidate with methods and techniques of instruction including oral communications, preparing lesson plans, writing performance objectives, use of audio and other training aids, and the selection, evaluation and preparation of performance tests. Meets and exceeds NFPA 1041 Level I standards. Restricted to: Community Colleges only.

FIRE 232. Firefighter Internship**3 Credits (3)**

Application of knowledge, skills and abilities in a fire service department, as a firefighter intern and integrated member of a fire affiliated agency. Restricted to majors.

Prerequisites: FIRE 101, FIRE 102, FIRE 115, FIRE 202 and EMT-B and consent of instructor.

FIRE 233. Practical Approach to Terrorism**3 Credits (3)**

Gives responder an overall safety approach in recognizing and responding to incidents involving terrorism. Presents an overview in types of harm, explosive weapons, chemical weapons, biological weapons and radiological weapons. Restricted to: Community Colleges only.

Crosslisted with: LAWE 233

FIRE 252. Vehicle Extrication**2 Credits (1+2P)**

This course will train the student to the Vehicle & Machinery Extrication level I as outlined in NFPA 1006, Standard for Technical Rescuer Professional Qualifications. Vehicle & Machinery Extrication certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 2 credits. Restricted to Community Colleges campuses only.

FREN-FRENCH

FREN 1110. French I**4 Credits (4)**

Intended for students with no previous exposure to French, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-high level. This is an introductory course designed to teach the student to communicate in French in everyday situations and to develop an understanding of French and Francophone cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.

Learning Outcomes

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can identify beliefs, behaviors and cultural artifacts of the French-speaking world.
9. In English, students will engage with social issues confronting the French-speaking world to develop their sense of personal and social responsibility.

FREN 1120. French II**4 Credits (4)**

A continuation of French I, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-low level. This course is designed to increase student fluency in French as applied to everyday situations. Students will also learn to recognize and understand various French and Francophone products, practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues. May be repeated up to 4 credits.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts of the French-speaking world.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2110. French III**3 Credits (3)**

In this third semester course, students will continue to develop a broader foundation in skills gained during the first year, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-mid level. This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various French and Francophone products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and discuss the nature and value of French and Francophone products, practices, and perspectives.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2120G. French IV**3 Credits (3)**

In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing French aiming at the ACTFL intermediate-high level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various French and Francophone products, practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction. May be repeated up to 3 credits.

Learning Outcomes

1. Students can participate with ease and confidence in conversations on familiar topics. They can usually describe people, places, and things. They can usually talk about events and experiences in various time frames.
2. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
3. Students can write about topics related to school, work, and community in a generally organized way. They can write some simple paragraphs about events and experiences in various time frames.
4. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can usually understand a few details of what I overhear in conversations, even when something unexpected is expressed. The student can sometimes follow what they hear about events and experiences in various time frames.
6. Students can understand the main idea of texts with topics related to everyday life, personal interests, and studies, as well as sometimes follow stories and descriptions about events and experiences in various time frames.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and recognize and discuss the representations and controversies of French and Francophone products, practices, and perspectives.
8. Students demonstrate the essential skills of Critical Thinking, Personal and Social Responsibility, and Information and Digital Literacy, as per the New Mexico General Education Curriculum

FREN 306. Topics in French Culture and Civilization**1-3 Credits (1-3)**

Selected topics focusing on French culture and civilization. This course is linked to FLIP (Faculty-Led International Programs) when applicable. May be repeated up to 4 credits.

Learning Outcomes

1. Recognize the arrondissements of Paris and describe their identifying characteristics.
2. Navigate through Paris effectively and knowingly.
3. Communicate effectively with native speakers of the language.
4. Exemplify qualities of a good guest in a francophone culture.
5. Talk knowledgeably about a topic related to Paris and Parisians.

FREN 315. French Grammar**3 Credits (3)**

A thorough review of French grammar through the study of grammatical elements and the use of grammatical exercises. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of the course, students should be familiar with a review of grammar for all tenses, pronouns, adverbs, adjectives.
2. Students should attain the intermediate high level in all areas (Listening, Speaking, Reading, Writing, Attitudinal / Cultural) on the American Council on the Teaching of Foreign Languages (ACTFL) scale.
3. By the end of the course, students should be familiar with spoken speech at paragraph level.
4. By the end of the course, students should be familiar with writing a narrative in the past and future tenses.

FREN 325. Intermediate Conversation**3 Credits (3)**

French conversation through intensive oral practice with emphasis on vocabulary acquisition and pronunciation. May be repeated up to 3 credits.

Learning Outcomes

1. To enhance active vocabulary acquisition.
2. To provide opportunities for the learner's speech to progress from short utterances to more connected, sustained speech.
3. To address pronunciation issues.
4. To enhance presentation skills.
5. To improve auditory proficiency.
6. Based on the scale established by the American Council on the Teaching of Foreign Languages (ACTFL), the performance goals for the course are: (A) Listening Intermediate High, (B) Speaking Intermediate High, (C) Reading Advanced Low, (D) Writing Intermediate High.

FREN 330. Business French**3 Credits (3)**

An introduction to standard language within the corporate world in French-speaking countries. Students practice reading, writing, listening, speaking and expanding their vocabulary in professional fields related to business.

Learning Outcomes

1. Use business and legal vocabulary.
2. Demonstrate basic competency in French corporate etiquette.
3. Interact in a culturally appropriate manner in common business situations, including meetings, sales calls, business letters, and e-mails.
4. Demonstrate familiarity in using French in business-related situations.

FREN 352. French Phonetics**3 Credits (3)**

Systematic description of modern French pronunciation. Corrective exercises for foreign learners. Formal study of spelling/pronunciation relationships. May be repeated up to 3 credits. Corequisite(s): FREN 2120

FREN 360. French Cinema**3 Credits (3)**

The evolution of contemporary French cinema. A critical understanding of film as an art form and as cultural expression.

Prerequisite: FREN 2120 or consent of instructor.

FREN 362. Contemporary French Culture**3 Credits (3)**

Institutions, lifestyles and popular attitudes in modern France.

Prerequisite: FREN 2120 or consent of instructor.

FREN 365V. Perspectives in French Culture**3 Credits (3)**

Examines components of French culture through literature, films and other sources. Taught in English. Does not satisfy Arts and Sciences second language requirement. Does not satisfy French major or minor requirements.

FREN 378. Studies in Francophone Cultures**3 Credits (3)**

Studies of representative Francophone cultures through their history, literature, music and films.

Prerequisite: FREN 2120 or consent of instructor.

FREN 381. Survey of French Literature I**3 Credits (3)**

Literary movements, authors and selected texts of the Middle Ages through the eighteenth century.

Prerequisite: FREN 2120 or consent of instructor.

FREN 382. Survey of French Literature II**3 Credits (3)**

Literary movements, authors and selected texts of the nineteenth and twentieth centuries.

Prerequisite: FREN 2120 or consent of instructor.

FREN 385. French Civilization**3 Credits (3)**

A detailed study of important events in French civilization from its origins to the twentieth century through the study and discussion of history, literature, fine arts and politics.

Prerequisite: FREN 2120 or consent of instructor.

FREN 386. Contemporary Women Writers in French**3 Credits (3)**

Exploration of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

Prerequisite: FREN 2120 or consent of instructor.

FREN 410. Paris: History and Cultures**3 Credits (3)**

An in-depth look at history and culture of Paris from its origins to the present.

Prerequisite(s): FREN 212 or consent of instructor.

FREN 425. Advanced French Conversation**3 Credits (3)**

Mastery of spoken French language through discussion of personal readings and group work to develop vocabulary, syntactical and conversational skills. The class is conducted entirely in French.

Prerequisite(s): FREN 325 or consent of instructor.

FREN 449. French for Specific Purposes**3 Credits (3)**

Directed reading for students to satisfy language requirement for master's or doctoral programs. May be repeated up to 6 credits.

FREN 451. Special Topics in French**1-3 Credits**

Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

FREN 453. Independent Studies in French**1-3 Credits**

Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

FREN 478. Studies in Francophone Cultures Around the World**3 Credits (3)**

Advanced studies of representative Francophone cultures through their history, literature, music and films.

Prerequisite: FREN 2120 or consent of instructor.

FREN 486. Advanced Contemporary Women Writers in French**3 Credits (3)**

Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.

Prerequisite: FREN 2120 or consent of instructor.

FSTE-FOOD SCIENCE & TECHNOLOGY

FSTE 1120. ACES in the Hole Foods I**4 Credits (4)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products Restricted to Las Cruces campus only. Students enrolled in this class must possess A Food Handler Card

Learning Outcomes

1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2110G. Food Science I**4 Credits (3+2P)**

The scientific study of the principles involved in the preparation and evaluation of foods. May be repeated up to 4 credits.

Learning Outcomes

1. Explain basic scientific principles involved in the preparation of high quality food products.
2. Utilize scientific inquiry in the experimental investigation of factors influencing the chemical, physical and sensory properties of food products.
3. Apply basic scientific principles, procedures, techniques and standards in the preparation of all types of high quality food products.
4. Use basic methods of quantitative analysis to critically evaluate quality characteristics of food.
5. Use sensory science techniques and terminology to critically evaluate acceptability and quality characteristics of food.
6. Describe high quality characteristics of a variety of food products using appropriate terminology.
7. Apply principles of sanitation and safety to food preparation.

FSTE 2120. ACES in the Hole Foods II**4 Credits (8P)**

Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. Student must also have a Food Handler Card to enroll in this course.

Prerequisite(s): FSTE 1120.

Learning Outcomes

1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2130G. Survey of Food and Agricultural Issues**3 Credits (3)**

Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with AEEC 2130G.

Learning Outcomes

1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulate modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

FSTE 2996. Special Topics**1-4 Credits**

Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

FSTE 320. Food Microbiology**4 Credits (3+2P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. May be repeated up to 4 credits. Prerequisite(s): (BIOL 2610G and BIOL 2610L), or (BIOL 2110G and BIOL 2110L)

FSTE 325. Food Analysis**3 Credits (2+2P)**

Basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. May be repeated up to 3 credits.

Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 331. Food Preservation**3 Credits (2+2P)**

Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. May be repeated up to 3 credits.

Prerequisite(s): FSTE 2110G.

FSTE 340. Cereal Technology**3 Credits (2+2P)**

This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.

Learning Outcomes

1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 350. Dairy Technology**3 Credits (2+2P)**

This course provides general knowledge on dairy technology as well as on various processing technologies regarding the science behind a variety of dairy products. It is designed to give a thorough understanding of the composition and properties of milk, and of the physical and chemical changes occurring in milk during processing and storage. These products include fluid milk, fermented dairy products, concentrated and dried dairy products, butter, cream and various frozen dairy desserts. Principles and practices in assembling, receiving, processing, and packaging milk and dairy products, including beverage, frozen, cream, butter, concentrated and fractionated milks, dried milks, casein, and lactose.

Prerequisite: FSTE 2110G.

Learning Outcomes

1. To gain an understanding of dairy processing technologies, unit operation and production of dairy products and ingredients.
2. To understand the principles of processing of dairy products by integrating the concepts of chemistry, biochemistry, microbiology, nutrition, sensory properties, and engineering relevant to dairy processing operations.
3. To gain an ability to think critically on practical problems that occur in the dairy industry and to appreciate the many challenges in dairy research technology and dairy product development.
4. To engage in group discussion on current issues pertinent to culture dairy industry.

FSTE 375. Professional Development in Food Science**1 Credit (1)**

Covers essential elements of career management including preparation for a successful internship. Students must have a Food Handler Card.

Restricted to: FSTE majors. Graded S/U.

Prerequisite: FSTE 2120.

Learning Outcomes

1. Describe their Jung Type.
2. Articulate their personal mission.
3. Identify their personal strengths and weaknesses.
4. Establish short and long term career goals.
5. Prepare an effective cover letter.
6. Develop a professional resume.
7. Understand the dos and don'ts of interviewing.
8. Properly dress for interviewing.
9. Understand the factors to consider when deciding what job offer to accept. 1
10. Understand the objectives and requirements of the Food Science internship program.

FSTE 421. Food Chemistry**3 Credits (3)**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing, and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods.

Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 423. Food Processing Technologies**4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting.

Prerequisite(s): FSTE 328.

FSTE 425. Sensory Evaluation of Foods and Product Development**3 Credits (2+2P)**

Application of affective sensory tests, chemical, physical, and experimental methods to the development and evaluation of a food product. Sensory test methods and procedures used to evaluate the flavor, color and texture of foods. Relationships between sensory and instrumental measurements quality parameters. The course will present the parametric and non-parametric tests that are used in sensory evaluation. May be repeated up to 3 credits.

Prerequisite: FSTE 2110G and (A ST 311 or MATH 1350G).

Learning Outcomes

1. Describe the chemical senses and the receptors that mediate the basic taste modalities.
2. Match sensory tests to research questions and to use the suitable statistical tests.
3. Design and develop a food product and conduct a basic research project.
4. Communicate research results using written, oral, and visual communication techniques.

FSTE 430. Brewing Science & Engineering**3 Credits (3)**

Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll. Crosslisted with: CHME 495.

Learning Outcomes

1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

FSTE 450. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

FSTE 475. ACES Foods at NMSU-Experiential Learning**1 Credit (2-8P)**

Professional work experience for FSTE majors only.

Prerequisite: FSTE 375.

Learning Outcomes

1. Students will collect a minimum of four hundred hours.

FSTE 476. FSTE Internship Seminar**1 Credit (1)**

A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they countered during FSTE 475 (Internship) and analyze them. Restricted to Food Science Technology majors.

Prerequisite: FSTE 475.

Learning Outcomes

1. Analyze business practices as experienced during an internship.
2. Deliver a presentation effectively communicating operations of ACES Foods at NMSU.
3. Assess use of state and federal food regulation agencies within ACES Foods at NMSU.
4. Present in written form the history, business operations, job descriptions, organizational structure, and human resource policies of ACES Foods at NMSU.

FSTE 480. Food Safety**3 Credits (3)**

Provide students' knowledge on good manufacturing practices and prerequisite programs, conduct hazard analysis and determine preventive controls, define process, food allergen, sanitation and supply-chain preventive controls and discuss verification validation, recall and recordkeeping requirements with training and educational opportunities related to current best practices and guidance, and future regulatory requirements by establishing the Produce Safety Alliance. Students participate in a Mock Audit. Participants will receive an official FSPCA Preventive Controls Qualified Individual certificate issues by AFDO after attending this training program.

Prerequisite(s): FSTE 320 or BIOL 311, or consent of instructor.

FSTE 490. Processed Meats**3 Credits (2+2P)**

This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic involvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.

Learning Outcomes

1. The theory and chemistry of meat processing.
2. Processing techniques and basic formulations of different categories of processed meats.
3. The effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. To evaluate products for consumer and analytical quality and composition.
5. To evaluate and assess defective products and propose processing/ingredient solutions.

FSTE 492. Special Problems**1-4 Credits**

Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

FSTE 500. Data Analysis for Food Scientists**3 Credits (3)**

An introduction to data analysis of food scientists. Modern statistical techniques used to analyze typical data collected by food scientists and researchers will be covered. Consent of Instructor required.

FSTE 520. Graduate Study in Food Microbiology**3 Credits (2+3P)**

Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.

Prerequisites: BIOL 2610G/2610L, or BIOL 2110G/2110L, or consent of instructor.

FSTE 521. Graduate Study in Food Chemistry**3 Credits (3)**

Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.

Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 523. Food Processing Technologies**4 Credits (3+2P)**

Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting. Additional work beyond that for FSTE 423 required at the graduate level.

Prerequisite(s): FSTE 528.

FSTE 524. Sensory Evaluation of Foods**3 Credits (2+3P)**

Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.

Prerequisite(s): FSTE 2110G and A ST 311 or MATH 1350G.

FSTE 525. Graduate Study in Food Analysis**3 Credits (2+3P)**

Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.

Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 531. Food Preservation**3 Credits (3)**

Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. Same as FSTE 331 with additional work required at the graduate level.

FSTE 532. Designing and Brewing Great Beers of the World**3 Credits (2+2P)**

The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweizen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

FSTE 540. Cereal Technology**3 Credits (2+2P)**

This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.

Learning Outcomes

1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 560. Rumen Microbiology (so)**3 Credits (3)**

Same as ANSC 560.

FSTE 598. Special Research Programs**1-4 Credits**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

FSTE 600. Special Research Program**1-6 Credits (1-6)**

Special research for doctoral students May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

FSTE 601. Cooperative Extension Service Field Experience**1-3 Credits (1-3)**

This course will provide students with knowledge and experience in community outreach through the cooperative extension service. This course is required for students pursuing a Ph.D. in FSHN. Students will work collaboratively with extension faculty on applied projects. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: FSHN majors.

FSTE 605. Doctoral Seminar**1 Credit (1)**

Current topics and research in Food Science and Human Nutrition. Course will include experts from the field as guest speakers. Students will have the opportunity to present their doctoral proposals and/or research findings.

FSTE 698. Doctoral Reserach**1-6 Credits (1-6)**

Research May be repeated up to 6 credits. Consent of Instructor required.

FSTE 700. Doctoral Dissertation**1-12 Credits (1-12)**

Dissertation May be repeated up to 18 credits. Consent of Instructor required.

Prerequisite(s): Passed the qualifying exam and comprehensive exam.

FWCE-FISH,WILDLF,CONSERV ECOL

FWCE 1110G. Introduction to Natural Resources Management 4 Credits (3+2P)

This class covers historical and current issues affecting the management of renewable natural resources with an emphasis on water, soil, rangeland, forest, fish, and wildlife resources. An emphasis is placed on the scientific method and critical thinking. In the laboratory students collect and analyze field data on topics covered above and write up each unit as a laboratory report.

Learning Outcomes

1. Students should be able to recall, describe and explain the laws, treaties and acts that have led to our current management of natural resources in the United States.
2. Students should recognize or explain what ecological processes are, the importance of ecological processes in maintaining ecosystem function and how human activities change ecological processes and the ecosystems dependent on those processes.
3. In each of the six course and lab modules (water quality, soils, forestry, rangelands, wildlife and fisheries) students should be able to recall, describe and explain basic terminology, fundamental ecological principles and management techniques and challenges.
4. Students should be able to interpret data presented graphically and in tables from class exercises and lectures.
5. Students should be able to solve problems scientifically through field data collection, laboratory analyses and the use of quantitative methods (basic statistics, tables and graphs).
6. Students should be able to communicate results from laboratory exercises (6 lab modules) orally and in writing.
7. Students will learn to apply scientific thinking to real world problems through in class discussion and short essays based on material from case studies presented in class and guest speakers.

FWCE 1120. Contemporary Issues in Wildlife and Natural Resources Management 3 Credits (3)

Ecological, socioeconomic, and political issues surrounding the management of our natural resources with an emphasis on fish and wildlife resources.

FWCE 2110. Principles of Fish and Wildlife Management 3 Credits (3)

Basic principles of fish and wildlife management including history, ecology, economics, and policy. Emphasis on wildlife and fisheries. Uses an ecosystem approach integrating living and nonliving resources.

Prerequisite(s): FWCE 1110G.

Learning Outcomes

1. The goal of this course is to provide a firm foundation in the principles of wildlife and fisheries management.
2. Material will include a background in biological principles geared towards animal populations, characteristics and management of the habitats utilized by fish and wildlife, techniques used to study and manage animals and their habitats, and aspects of the human dimension involved in wildlife and fisheries issues.
3. This course serves as a core requirement for degrees offered in the Department of Fish, Wildlife and Conservation Ecology and as a required course for degrees in other departments such as Rangeland Resources.

FWCE 301. Wildlife Ecology

3 Credits (3)

General ecological theory with emphasis on concepts including biogeography, species interactions, population dynamics and disease ecology as they relate to the management and conservation of vertebrates. **Prerequisite(s):** BIOL 2610G

FWCE 330. Natural History of the Vertebrates

4 Credits (3+3P)

Evolution, ecology, and diversity of vertebrates. Topics include comparative anatomy and physiology, biogeography, community ecology, behavior, and conservation. Laboratory emphasizes identification of local taxa. Field trips may be required.

Prerequisite(s)/Corequisite(s): BIOL 322. **Prerequisite(s):** BIOL 2610G and BIOL 2610L.

FWCE 355. Wildlife Techniques and Analysis

4 Credits (3+2P)

FWCE 355 will provide a broad overview of basic skills and techniques that are commonly used by biologists in performing management, research, and reporting functions in natural resource fields with an emphasis on wildlife techniques, data processing and analysis.

Prerequisite(s): FWCE 301, A ST 311.

FWCE 357. Fisheries Management and Analysis

4 Credits (3+2P)

Lectures and laboratory exercises provide a broad overview of basic skills and techniques used for assessing and managing fish populations.

Prerequisite(s): FWCE 301 and A ST 311.

FWCE 391. Internship

1-3 Credits (1-3)

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/ U, Audit).

Prerequisite(s): Consent of instructor.

FWCE 393. Professional Experience and Communication

3 Credits (3)

Professional work experience under the supervision of employer and/or a faculty member. Written report and presentation is required.

Prerequisite(s)/Corequisite(s): FWCE 2110.

FWCE 402. Seminar in Natural Resource Management

1 Credit (1)

Review and discussion of current topics in natural resource management.

Prerequisite(s): Senior standing or above.

FWCE 409. Introduction to Population Ecology

3 Credits (3)

Quantitative analysis of vital statistics and mechanisms affecting dynamics of wild populations. Patterns of growth, age structure, survival, and natality. Population theories and life tables.

Prerequisite(s): MATH 1430G and FWCE 2110.

FWCE 430. Avian Field Ecology

4 Credits (3+3P)

Principles of avian ecology and management with an emphasis on taxonomy, physiology, behavior and field studies. Includes weekly field trips focusing on identification and behavior of Southwest birds.

Prerequisite(s)/Corequisite(s): FWCE 330.

FWCE 431. Mammalogy**4 Credits (3+2P)**

Classification, identification, anatomy, physiology, life history, and ecology of mammals. Field trips required.

Prerequisite(s): FWCE 2110 and FWCE 330.

FWCE 432. Environmental Biology of Fishes**4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 532.

Prerequisite(s): CHEM 1215G and senior standing.

FWCE 434. Aquatic Contaminants and Toxicology**4 Credits (3+3P)**

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Taught with FWCE 534. Crosslisted with: ENVS 434.

Prerequisite(s): CHEM 1215G and senior standing.

FWCE 437. Wildlife Damage Management**3 Credits (3)**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 537.

Prerequisite(s): BIOL 2610G, FWCE 2110, FWCE 301, FWCE 409.

FWCE 447. Wildlife Law and Policy**3 Credits (3)**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 547.

Prerequisite(s): Junior or Senior level standing.

FWCE 448. Problems**1-3 Credits (1-3)**

Individual investigations in fishery or wildlife science. Maximum 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): 18 credits in WLSC.

FWCE 450. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester. May be repeated up to 9 credits. Consent of Instructor required.

FWCE 457. Ecological Biometry**3 Credits (3)**

Use of ecological data to test scientific hypotheses, stochastic and statistical models for environmental data, data visualization, likelihood-based and information-based model selection. Emphasis on open-source software tools.

Prerequisite(s): MATH 1430G or MATH 1511G, A ST 311, FWCE 301.

FWCE 459. Aquatic Ecology**4 Credits (4)**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 559.

Prerequisite(s): FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

FWCE 464. Management of Aquatic and Terrestrial Ecosystems**3 Credits (3)**

Principles and methods for managing aquatic and terrestrial ecosystems and their fish and wildlife resources. Emphasis on quantitative techniques, data collection and analysis for management of systems at a landscape spatial scale.

Prerequisite(s): (BIOL 301 or FWCE 301) FWCE 330, A ST 311.

Learning Outcomes

1. Demonstrate an understanding of The North American Model and the Public Trust Doctrine.
2. Demonstrate an understanding of the funding mechanisms underlying fish and wildlife management.
3. Demonstrate an understanding of the policies and laws germane to fish and wildlife management.
4. Demonstrate an understanding of the constraints facing modern fish and wildlife management.
5. Exhibit effective written and verbal communication skills.

FWCE 467. Herpetology**4 Credits (4)**

Systematics, taxonomy, ecology, behavior, and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 567.

Prerequisite(s): FWCE 330.

FWCE 471. GIS for Natural Resource Scientists**4 Credits (4)**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 571.

FWCE 472. Wildlife Museum Internship**1-4 Credits (1-4)**

Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): BIOL 2610G and BIOL 2610L.

FWCE 482. Ichthyology**4 Credits (3+2P)**

Classification, morphology, identification, life history, and ecology of fishes.

Prerequisite(s): FWCE 330 or consent of instructor.

FWCE 509. Population Ecology (s)**3 Credits (2+2P)**

Quantitative analysis of vital statistics and mechanisms promoting stability in wild populations. Theory and application of life tables and population models.

FWCE 515. Graduate Seminar**1 Credit (1)**

Current topics.

FWCE 530. Large Mammal Ecology, Conservation and Management**3 Credits (3)**

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 436.

FWCE 532. Environmental Biology of Fishes**4 Credits (3+3P)**

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 432; however, students are responsible for all requirements in FWCE 432, plus additional assignments.

FWCE 535. Special Topics**1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

FWCE 537. Wildlife Damage Management**3 Credits (3)**

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 437. Students are responsible for all requirements for FWCE 437 plus additional work. Prerequisite(s): BIOL 2610G, FWCE 2110, FWCE 301 and FWCE 409

FWCE 540. Wildlife Habitat Relationships**4 Credits (3+1P)**

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses.

Learning Outcomes

1. The addition of the laboratory component to the course will provide graduate students with hands on experience implementing current statistical approaches for modeling wildlife habitat relationships including selection ratios, resource selection functions, resource utilization functions, step-selection functions and other approaches.

FWCE 547. Wildlife Law and Policy**3 Credits (3)**

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 447.

FWCE 548. Graduate Problems**1-3 Credits (1-3)**

Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree. May be repeated up to 6 credits.

FWCE 558. Nonthesis Project**1-6 Credits (1-6)**

Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students. May be repeated up to 6 credits.

FWCE 559. Aquatic Ecology**4 Credits (4)**

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 459.

Prerequisite(s): FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

FWCE 567. Herpetology**4 Credits (4)**

Systematics, taxonomy, ecology, behavior and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 467.

FWCE 571. GIS for Natural Resource Scientists**4 Credits (4)**

Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 471.

FWCE 582. Ichthyology**4 Credits (4)**

Classification, morphology, identification, life history, and ecology of fishes. Taught with FWCE 482.

FWCE 598. Special Research Programs**1-3 Credits (1-3)**

Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program. May be repeated up to 6 credits.

FWCE 599. Master's Thesis**1-9 Credits (1-9)**

Thesis. May be repeated up to 30 credits. Thesis/Dissertation Grading.

FYEX-FIRST YEAR EXPERIENCE

FYEX 1110. First-year Seminar

1-3 Credits

This course is designed to help students achieve greater success in college and in life. Students will learn many proven strategies for creating greater academic, professional, and personal success. Topics may include career exploration, time management, study and test-taking strategies to adapt to different learning environments, interpersonal relationships, wellness management, financial literacy, and campus and community resources.

Learning Outcomes

1. Recognize the ways in which s/he is responsible for her/his own experience in education.
2. Identify, locate, and utilize available campus resources essential for academic success.
3. Create long-and short-term goals associated with student success and career planning.
4. Implement time management techniques to organize the semester's workload.
5. Develop strategies to use individual strengths to succeed and reflect upon coursework and course progress in multiple classes to alter academic behaviors and create deeper meaning and learning.
6. Apply the skills essential for analyzing and solving problems in her/his academic, professional, and personal life, which may include financial literacy and wellness management.
7. Develop and apply essential skills such as reading, taking notes, studying, memorizing, taking tests, and self-management skills necessary for college success.
8. Identify and revise self-defeating patterns of behavior, thought, and emotion as well as unconscious limiting beliefs.
9. Develop supportive relationships with members of the campus community. 1
10. Develop essential reading, writing, and critical thinking skills used in study and in research. 1
11. Demonstrate understanding of how to use the computer for academic purposes, including learning management systems, email communications, research databases, degree audit, and other online resources.

FYEX 1112. The Freshman Year Experience

3 Credits (3)

An introduction to the university and its resources; emphasis on development of academic and personal skills that enable freshmen to become successful learners. Restricted to: Main campus only.

Prerequisite(s): Freshman Standing Only.

Learning Outcomes

1. Appreciate the goals, methods, and values of higher education
2. Expand intellectual development and self-direction
3. Establish a faculty mentor relationship
4. Enhance knowledge and practice of collaborative learning principles
5. Establish a familiarity with campus resources and student services
6. Develop public speaking, critical thinking, library research, and study strategies
7. Evaluate talents and interest in relation to selecting a major and career planning
8. Examine and clarify values
9. Acknowledge and enhance respect for diversity

FYEX 1116. Managing Your Money

1 Credit (1)

Principles and strategies for effective money management. Includes financial goal setting, both short and long term. Explores the relationship between career and income earning potential. Explores issues of credit and debt management and prevention of identity theft.

Learning Outcomes

1. Demonstrate understanding of the psychology of money and how it relates to personal financial decisions
2. Create realistic short- and long-term financial goals and a personal budget
3. Comprehend and manage college finances, including types of financial aid
4. Appreciate the importance of the Free Application for Federal Student Aid (FAFSA)
5. Describe the financial aspects of career development and how they apply to their own lives, including resume, taxes, salary, benefits
6. Apply principles of student loan management
7. Demonstrate use of credit reports in the prevention identity theft
8. Identify essential elements of smart spending and borrowing
9. Recognize debt and repayment costs 1
10. Explain the basics of saving and planning for the financial future 1
11. Create focused, developed, clear discussion posts and other written work for this class

FYEX 1117. Financial Literacy Money Matters

2 Credits (2)

This course will cover a variety of financial literacy topics ranging from budgeting to student loan repayment. This course is designed to assist students in becoming more financially literate. Restricted to Las Cruces campus only.

Learning Outcomes

1. Master effective strategies and other skills related to financial literacy
2. Establish a familiarity with campus resources designed to foster financial literacy and wellness
3. Exhibit intellectual development and self-direction in relation to financial literacy and wellness
4. Identify financial literacy skills which best support individual financial well-being
5. Demonstrate skills and knowledge that allows the student to make informed and effective decisions with all of their financial resources

FYEX 1131. Personal Learning Skills I**1-3 Credits**

Individualized programs for self-improvement in skill areas necessary for academic success in the university environment. Each course to bear an appropriate subtitle. May be repeated up to 3 credits. Graded S/U.

Learning Outcomes

1. Synthesize the importance of critical thinking through self-reflection and self-exploration
2. Analyze and apply critical thinking skills using the eight intellectual standards
3. Describe the common barriers to critical thinking and construct problem solving strategies
4. Evaluate information and knowledge to determine misinformation and inaccuracies
5. Demonstrate information literacy by recognizing when information is needed and being able to efficiently locate, accurately evaluate, effectively use, and clearly communicate the information in various formats and mediums

FYEX 1132. Academic and Personal Effectiveness**2 Credits (2)**

Learn academic self-analysis skills through the application of study and learning techniques to current course demands. Exposure to a variety of topics which enhance university and life-long learning.

Learning Outcomes

1. Students will demonstrate mastery of course objectives in time management, stress management, test taking, and other skills through completion of activities, quizzes, discussions, and more.
2. Students will be able to identify NMSU campus resources, including their services, location, and contact information.
3. Students will exhibit intellectual development and an improved self-direction through participation in the course.
4. Students will be able to identify and adopt those management skills which best support academic and career choices.

FYEX 1133. Academic Reading and Study Skills**1-4 Credits**

Introduction to and practice with strategies for effective reading and studying at the college level. Provides laboratory.

Learning Outcomes

1. Use reading strategies to synthesize texts
2. Identify rhetorical elements of texts
3. Identify and apply different study methods
4. Recognize the role of student support services for student success
5. Identify and practice effective time management skills
6. Demonstrate proficient computer skills
7. Write an effective summary

FYEX 1134. Speed Reading**1 Credit (1)**

Introduction to strategies and techniques for increasing reading rate and comprehension related to academic areas.

Learning Outcomes

1. Demonstrate an understanding of speed reading strategies and eye movement drills
2. Expand vocabulary and reading comprehension
3. Improve reading rates and develop reading techniques
4. Demonstrate an understanding of skimming techniques and scanning strategies

FYEX 1140. Career Exploration**1 Credit (1)**

Survey of careers possible with community college associate degrees. Information on how to make a career choice.

Learning Outcomes

1. Desired career and lifestyle
2. Areas of interest
3. Skills and abilities
4. Personal values
5. DACC programs that match the student's interests, abilities, and values
6. Three careers that match the student's interests, abilities, values, and personality

FYEX 1160. Tutorial**1-3 Credits**

Development of specific skills required for college courses, such as note-taking, listening, and test-taking. To be taken in conjunction with a regular designated college course.

Learning Outcomes

1. Demonstrate the ability to organize their time in order to improve study habits.
2. Apply pre-reading strategies to improve reading concentration and comprehension.
3. Demonstrate basic understanding of the systems of the body.
4. Identify techniques to improve personal concentration and comprehension skills.
5. Identify and demonstrate listening skills.
6. Identify effective study and note taking skills.
7. Identify and demonstrate effective test-taking skills.
8. Identify critical thinking skills used in nursing.
9. Demonstrate knowledge of key terms.

FYEX 1170. NMSU Gospel Choir**1 Credit (1)**

Students will gain performance experience and exposure to urban contemporary gospel music. Open to all majors. May be taken for unlimited credit. Restricted to: Main campus only.

Learning Outcomes

1. Comprehended the foundation related to singing in a gospel choir setting
2. Demonstrate an understanding of the difference between the musical treble and bass clef
3. Expand vocabulary and reading comprehension of gospel music terminology.
4. Improve the speed and accuracy of music sheet and sight reading

FYEX 1996. Special Topics**1-4 Credits**

Covers specific study skills and critical thinking topics. Specific sub-titles to be listed in the Schedule of Classes. May be repeated for a maximum of 8 credits.

Learning Outcomes

1. Varies

FYEX 2994. Prior Learning: Professional Portfolio**1-6 Credits**

Creating a portfolio that outlines professional and educational experiences. Life skills and education learned through workplace training and non-traditional education experiences will be evaluated for consideration of awarding college credit. Students will draft a life history paper, prepare a professional resume, assemble supporting documentation and evidence in support of their petition to receive college credit for prior learning. Culminating activities will include an oral presentation of the portfolio contents. Graded S/U.

Prerequisite(s): CCDE 110 N or equivalent.

Learning Outcomes

1. produce writing that is focused on a main point
2. produce writing that is organized
3. produce writing follows task-specific conventions of paragraphing, sentence boundaries, usage, agreement, punctuation and spelling
4. deliver effective speeches
5. organize and present information with a purpose
6. apply effective communication strategies in their personal and professional lives

G S-GRADUATE STUDIES

G S 500. Masters Non-Thesis Final Exam Credit**1 Credit (1)**

Course for non-thesis masters students who have completed all program requirements except the final comprehensive exam. A maximum of 12 credits may be earned. Graded S/U.

Prerequisites: advisor signature required.

G S 596. Special Topics**12 Credits (12)**

Special Topics course for masters and doctoral students. Max be repeated up to 12 credits. Graded S/U.

Learning Outcomes

1. Varies

G S 600. Doctoral Research**1-15 Credits**

Course number is used for assigning credit for research performed prior to successful completion of the doctoral comprehensive examination.

G S 700. Doctoral Dissertation**15 Credits**

Dissertation.

GENE-GENETICS

GENE 1110. Experimental Systems in Genetics**1 Credit (1)**

Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.

Learning Outcomes

1. To give the students a historical perspective on the field of genetics.
2. To familiarize the students to introductory concepts and vocabulary to the field of genetics.
3. Introduce experimental systems within the field of genetics and to give perspective to current genetic research.
4. As this course is designed for beginning students as an overview of faculty and research labs on campus. The students majoring in genetics are encouraged to meet with faculty and to explore opportunities available to them on campus

GENE 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

GENE 305 L. Genetic Techniques**1 Credit (3P)**

Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics.

Prerequisite(s)/Corequisite(s): GENE 315, or AGRO/ANSC/BIOL/HORT 305.

GENE 315. Molecular Genetics**3 Credits (3)**

Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics. Recommend CHEM 313.

Prerequisite(s): CHEM 1225G and BIOL 2110G.

GENE 320. Hereditary and Population Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.

Prerequisite(s): CHEM 1215G & BIOL 2110G.

GENE 391. Genetics Internship**1-6 Credits (1-6)**

Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

GENE 440. Genetics Seminar**1 Credit (1)**

Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology. Consent of instructor required.

Prerequisite(s): Seniors only; GENE 315 & GENE 320.

GENE 449. Special Problems**1-3 Credits (1-3)**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

GENE 450. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

GENE 452. Applied Bioinformatics**3 Credits (3)**

Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.

GENE 486. Genes and Genomes**3 Credits (3)**

Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, aneuploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

GENE 488. Gene Regulation**3 Credits (3)**

Extensive coverage of signal transduction processes and approaches used to monitor large scale changes in gene regulation and protein synthesis that occur during development and in response to environmental changes.

Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315.

GEOG-GEOGRAPHY

GEOG 1110G. Physical Geography**4 Credits (3+3P)**

This course introduces the physical elements of world geography through the study of climate and weather, vegetation, soils, plate tectonics, and the various types of landforms as well as the environmental cycles and the distributions of these components and their significance to humans.

Learning Outcomes

1. Define, describe, illustrate, distinguish among or explain the use of maps, map scale, globes, map projections, and remote sensing.
2. Define, describe, illustrate, distinguish among or explain the various elements of the earth's atmosphere, earth's relation to the sun, incoming solar radiation, the ozone layer, the primary temperature controls, and the unequal heating of land and water.
3. Define, describe, illustrate, distinguish among or explain the weather makers (air temperature, air pressure, humidity, clouds, precipitation, visibility, and wind [including pressure gradient, the Coriolis force, and friction]).
4. Define, describe, illustrate, distinguish among or explain air masses, pressure systems, the various fronts and associated types of storms, weather symbols, monsoons, the various forms of precipitation, along with causes and effects of lightning.
5. Define, describe, illustrate or explain the hydrologic cycle, the characteristics and influences of the oceans and continents on the weather, the Southern Oscillation (i.e., El Nino), the effects of land/water distribution, and climates and their global distribution.
6. Define, describe, illustrate or explain the biosphere, including organisms (flora and fauna), food chains, ecosystems and relationships. Define, describe, illustrate or explain soils in terms of soil-forming processes, components, properties, and classification.
7. Define, describe, illustrate or explain the structure of the earth, the internal processes, weathering and mass wasting, fluvial processes, characteristics and processes of arid regions, processes of coastal and Karst topographical regions, the processes and characteristics of glaciation (mountainous and continental).
8. Define, describe, illustrate, distinguish among or explain specific impacts by humans on weather, climate, and on the ecosystem at large.
9. Perform tests and collect data to analyze and classify weather, climate and landforms characteristics, processes, and impacts both quantitatively and qualitatively. This includes reading and extracting basic information from maps, diagrams, remote sensing devices, graphs, and tables. 1
10. Apply critical thinking skills such as inductive, deductive, and mathematical reasoning to solve problems using the scientific method. This includes interpreting maps, graphs and photos. 1
11. Recognize and discuss the effect of human activity on climate, climate change, the greenhouse effect, and on landforms at large. 1
12. Synthesize information from external, current sources and personal observations and discuss their relationships to class material.

GEOG 1120G. World Regional Geography**3 Credits (3)**

Overview of the physical geography, natural resources, cultural landscapes, and current problems of the world's major regions. Students will also examine current events at a variety of geographic scales.

Learning Outcomes

1. Identify, describe, illustrate, distinguish among or explain the basic concepts of geography, the major world regions, areal differences and similarities, the processes that shape geography natural and human, the use of maps, and the key topics of geographical interpretation (e.g., location, world importance, population, political status, resources, etc.).
2. Identify, describe, illustrate, distinguish among or explain the regional groups of Europe, its historical background, its languages and religions, major features, the diversified economy, political structures, and impact on globalization.
3. Identify, describe, illustrate, distinguish among or explain the regional groups of Russia and its satellite nations, its historical background, their languages and religions, major features, their diversified economies, political structures, current problems, and impact on globalization.
4. Identify, describe, illustrate or explain the regional nations of Middle East, their historical background, their languages and religions, the major features, the diversified economies and political structures, the current problems.
5. Identify, describe, illustrate, distinguish among or explain the regional groups of Asia, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
6. Identify, describe, illustrate, distinguish among or explain the regional groups of the Pacific World, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
7. Identify, describe, illustrate, distinguish among or explain the regional groups of Africa, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
8. Identify, describe, illustrate, distinguish among or explain the regional groups of Latin America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
9. Identify, describe, illustrate, distinguish among or explain the regional groups of Anglo-America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization. 1
10. Collect data to analyze or classify the region various historical developments and trends relating to globalization 1
11. Apply critical thinking skills in predicting future developments and impacts in economics, cultural diversity, and political stability globally. 1
12. Recognize and discuss current political "hot-spots," their causes, and potential results with regards to globalization. 1
13. Synthesize information the data into a comprehensive world-view.

GEOG 1130G. Human Geography**3 Credits (3)**

This course serves as an introduction to the study of human geography. Human geography examines the dynamic and often complex relationships that exist between people as members of particular cultural groups and the geographical "spaces" and "places" in which they exist over time and the world today.

Learning Outcomes

1. Locate on maps, globes, and other technologies various geo-political spaces and places around the world, including in the United States.
2. Describe the primary concepts, theories, methods and terms prevalent in the field of human geography.
3. Apply core geographic concepts to the spatial patterns demonstrated in real-world scenarios.
4. Identify the relationships that influence human-environment interaction in a specific location at a specific time.
5. Define and utilize key concepts to explain human social and cultural change over time and across geographical space.
6. Explain the geographic context of a current event or conflict.
7. Identify a current event that illustrates a core cultural geographic concept.
8. Think critically, discuss, and write about the relationships of the natural world to human geography.

GEOG 2130. Map Use and Analysis**3 Credits (2+3P)**

Exploration of the cartographic medium. Development of critical map analysis and interpretation skills, and map literacy. Comprised of traditional lecture, labs, and map use projects.

Learning Outcomes

1. Accurately measure bearings and distances on maps.
2. Read and interpret terrain and landform representation.
3. Utilize a magnetic compass for basic land navigation and basic map making.
4. Utilize a GPS instrument for basic land navigation.
5. Recognize and describe basic physical and cultural spatial patterns portrayed on maps.
6. Analyze and interpret the significance of spatial patterns portrayed on maps.
7. Perform elementary spatial statistical analysis on geographic data.
8. Appreciate and utilize the significance of place names and cultural patterns.
9. Critically examine maps for evidence of information misuse or propagandist motives. 1
10. Recognize and utilize appropriate map categories, symbols, projections, and coordinate systems to effectively and accurately portray, read, analyze, and interpret geographic data.

GEOG 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

GEOG 315V. World Agriculture and Food Problems**3 Credits (3)**

Survey of food and agricultural issues in the U.S. and other countries. Covers: role of agriculture in economic development; trade in food and agricultural products; global food production, consumption, and marketing patterns; economics of technical change and food assistance; agriculture and the environment. Same as AEEC 315V.

GEOG 325V. New Mexico and the American West**3 Credits (3)**

Examination of the cultural and historical patterns, economic activities, and physical characteristics of New Mexico and the American West. Special focus is given to human, environmental, and cultural landscapes, as well as current issues and challenges in New Mexico, the West, and the border region.

GEOG 326. U.S. National Parks**3 Credits (3)**

Exploration of origins, landscapes, ecosystems, management issues, and conflicts in U.S. National Parks. The regional geography of the United States as seen through the creation and protection of biologically and culturally significant lands.

GEOG 328V. Geography of Latin America**3 Credits (3)**

Explores Latin America from a geographical perspective, integrating environmental, cultural and socioeconomic factors in an in-depth study of the development of the region and contemporary issues and challenges facing the region. Special focus is given to examining applied problems facing Latin America at a range of scales.

GEOG 331V. Europe**3 Credits (3)**

Focus on the cultural continent of Europe. An overview of climate, physical geography, and human geography of Europe, including a brief historical geography of the continent. Current environmental, social, and political issues of Europe will be discussed, with a particular focus on the fate of EU.

GEOG 351. Fundamentals of Biogeography**3 Credits (3)**

Exploration of life in space and time. Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment. Includes an individual research project resulting in a poster presentation. Crosslisted with: GEOG 557.

GEOG 353. Geomorphology**3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 553. Crosslisted with: GEOL 353.

GEOG 357. Climatology**3 Credits (3)**

Elements and controls of climate. Energy and hydrologic cycles, general circulation, climate classification, distribution of climate types, microscale effects, applications.

Learning Outcomes

1. Students will be able to describe the fundamental processes that create climate on Earth.
2. Students will be able to describe the physical laws that comprise the climate system.
3. Students will be able to describe the trends in Earth's climate system.
4. Students will be able to summarize our current knowledge of climate change.

GEOG 361V. Economic Geography**3 Credits (3)**

The geographic relationships of supply and demand resources, population, and transportation. Site analysis and decision-making in different economic systems and cultures and how these decisions affect the environment and the location of economic activities.

GEOG 363V. Cultural Geography**3 Credits (3)**

The world's diverse cultural landscapes. Emphasis on the connections between social, political, religious, and agricultural patterns and the impact of societies on the natural environment.

GEOG 365V. Urban Geography**3 Credits (3)**

The global historical development of urban areas, as well as the changing functions of today's cities. A comparison between the North American city system and cities in Europe, Asia, and South America, including the development of the city form, the internal spatial organization of commercial, residential, and industrial areas, and socio-economic and political factors.

GEOG 373. Introduction to Remote Sensing**4 Credits (3+3P)**

Introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing products. Taught with GEOG 573.

GEOG 381. Cartography and Geographic Information Systems**4 Credits (3+3P)**

Design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 571.

GEOG 401. Internship/Co-op**1-3 Credits (1-3)**

Provides an opportunity whereby students work with a local, regional, or federal agency, or private sector firm on applied geographic work, under the supervision of an agency or firm professional and a geography faculty member. Consent of instructor required.

GEOG 435. Environmental Planning**3 Credits (3)**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 535.

GEOG 441. System Design for Geographic Information Science (GIS)**3 Credits (3)**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted system design methodologies intended to create a successful implementation of GIS inside organizations. Crosslisted with: GEOG 581.

GEOG 452. Landscape Ecology**4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Crosslisted with: GEOG 552.

GEOG 455. Southwest Environments**3 Credits (3)**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 555.

GEOG 467. Transportation Geography**3 Credits (3)**

Nature and distribution of land, air and water transport facilities and their importance in regional development.

Learning Outcomes

1. Develop familiarity with various transportation theories and concepts.
2. Demonstrate accurate use and application of terms and vocabulary used in the transportation field.
3. Understand and demonstrate familiarity with concepts of urban, inter-urban and rural transport systems.
4. Be able to describe and organize bulk and international Multimodal freight patterns and processes.
5. Demonstrate familiarity and application of transportation laws, rules and regulations at the national and international level.

GEOG 473. Advanced Remote Sensing**4 Credits (3+3P)**

Introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. Taught with GEOG 573.

Prerequisite(s): C- or better in GEOG 373.

GEOG 481. Fundamentals of Geographic Information Science (GIS)**4 Credits (3+3P)**

Fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Crosslisted with: GEOG 578.

GEOG 482. Geodatabase Design**3 Credits (2+3P)**

A practical introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally, implementation and documentation. Taught with GEOG 572.

Prerequisite(s): C- or better in GEOG 481.

GEOG 483. Field Explorations in Geography**3 Credits (6P)**

A field-based class where students complete exercises in physical, human, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. Taught with GEOG 583.

GEOG 488. GIS and Water Resources**3 Credits (3)**

Explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student area of interest. Taught with GEOG 588.

GEOG 491. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

GEOG 493. Special Problem Research**1-3 Credits**

For advanced and exceptional students. Research, and preparation of a paper in some phase of geography. A maximum of 6 credits may be earned. Consent of instructor required.

GEOG 495. Directed Readings**1-3 Credits**

Individual study through selected readings. A maximum of 6 credits may be earned. Consent of instructor required.

GEOG 501. Research Design and History of Geographic Thought**3 Credits (3)**

Understanding and application of the research process, including conceptualization and definition of a research problem, study designs, data sources, data collection, and report writing in development of geographic thought.

GEOG 512. Geohumanities Seminar**3 Credits (3)**

In recent years, artists, writers, and humanities scholars have increasingly engaged with geographic concerns, and geographers have incorporated humanities-based approaches to their work. Broadly known as the geohumanities, these interdisciplinary endeavors offer exciting ways to engage with key geographic concepts such as place, landscape, and nature. This graduate level seminar will examine both critical and creative approaches to the geohumanities. Subtitles indicate unique topics. Taught with GEOG 412. May be repeated up to 6 credits.

Learning Outcomes

1. Articulate their own understanding of the geohumanities as an interdisciplinary field, including its practices and its histories that draw on geography's intersection with multiple humanities fields.
2. Identify key texts, thinkers, and practices in the geohumanities, as well as spaces (such as both scholarly and public-facing journals and digital spaces) where geohumanities work is currently being advanced and developed.
3. Analyze, critique, and engage with current debates and directions within the geohumanities.
4. Apply geohumanities approaches within their own work by developing and producing a creative and/or critical project that advances their own research/scholarly/creative interests.

GEOG 535. Environmental Planning**3 Credits (3)**

Exploration of planning tools that advance the management of land and water resources, meeting current societal needs, while also minimizing damage to nature and society. Class activities include applied exercises that explore contemporary planning issues, including land conservation, natural hazards, biophysical analysis, water resource management, Federal land issues, and remediation of Superfund sites. Taught with GEOG 435.

GEOG 552. Landscape Ecology**4 Credits (3+2P)**

Analysis of the structure, function and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management. Taught with GEOG 452.

GEOG 553. Geomorphology**3 Credits (2+3P)**

Examination of the principle theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Taught with GEOG 353.

GEOG 555. Southwest Environments**3 Credits (3)**

The U.S. Southwest: physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 455.

GEOG 557. Fundamentals of Biogeography**3 Credits (3)**

Exploration of life in space and time. Floristic and physiognomic characteristics of the Earth's major ecosystems and their distributions; ecosystem dynamics, evolution, and physical environment. Includes an individual research project resulting in a poster presentation. Additional work for graduate students. Crosslisted with: GEOG 351.

GEOG 571. Cartography and Geographic Information Systems**4 Credits (3+3P)**

Graduate level design and construction of thematic maps. Introduction to cartographic principles in lecture. Emphasis on map-making using GIS software in the labs. Taught with GEOG 381.

GEOG 572. Geodatabase Design**3 Credits (2+3P)**

Graduate level introduction to designing geodatabases. The course takes you through the eleven steps of geodatabase design divided into four stages: thematic characterization; developing the database elements, relationships and properties; capture and collection; and finally implementation and documentation. Taught with GEOG 482.

GEOG 573. Introduction to Remote Sensing**4 Credits (3+3P)**

Graduate level introduction to the theory, techniques, and applications of remote sensing. Topics include electromagnetic radiation; remote sensing systems; remote sensing of the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Course includes lectures and also labs focused on the basic analysis and interpretation of remote sensing product. Taught with GEOG 373.

GEOG 578. Fundamentals of Geographic Information Science (GIS)**4 Credits (3+3P)**

Graduate level fundamentals of computer-based systems which organize, analyze, and present spatially referenced data. Additional work for graduate students. Crosslisted with: GEOG 481.

GEOG 581. System Design for Geographic Information Science (GIS)**3 Credits (3)**

A critical aspect of GIS is its ability to provide the necessary products within the organization within which it is implemented. This is an in-depth analysis of currently accepted planning methodologies designed to create a successful implementation of GIS inside organizations. Taught with GEOG 441.

GEOG 582. Advanced Remote Sensing**4 Credits (3+3P)**

Graduate level introduction to advanced topics in digital image processing, analysis, interpretation, and visualization. Topics include geometric and radiometric correction, image enhancement, image classification, change detection, and accuracy assessment. Lectures focus on the discussion of advanced remote sensing concepts, techniques, and applications; labs are applications-oriented. May be repeated up to 4 credits.

GEOG 583. Field Explorations in Geography**3 Credits (6P)**

A graduate level field-based class where students complete exercises in physical, cultural, and environmental geography in the Southwest. May be offered as a two-week intensive class where students are away from Las Cruces and camping; or may be offered with weekend field trips depending on the instructor. A lab fee for transportation and other expenses is required. May be repeated up to 3 credits.

GEOG 585. Advanced Spatial Analysis**3 Credits (3+2P)**

Introduction to basic spatial and aspatial descriptive statistics, statistical analysis of point and area patterns, critical review of quantitative research in geography, and exploration of advanced spatial analysis routines including cluster analysis, hot/cold spot analysis, and spatially weighted regression.

Prerequisite(s): Knowledge of basic statistics recommended.

GEOG 588. GIS and Water Resources**3 Credits (3)**

This is a graduate level class that explores a range of GIS tools, routines, and data structures and then applies them to a range of research questions and management issues in the area of Water Resources. The class has both a lecture and laboratory component, and students will have opportunities to explore a range of GIS tools in formal lab exercises and a project in the student's area of interest. Taught with GEOG 488.

GEOG 595. Directed Readings**1-3 Credits**

Advanced individual study through selected readings. May be repeated for a maximum of 6 credits.

GEOG 596. Residency**1-12 Credits (1-12)**

A contractual learning experience in the public or private sector under the supervision of a field supervisor and two faculty members. May be repeated up to 12 credits. Consent of Instructor required. Restricted to: Geography majors.

GEOG 598. Selected Topics**1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected geographic themes. May be repeated for unlimited credit.

GEOG 599. Master's Thesis**1-12 Credits (1-12)**

Supervised individual study of a student's thesis topic. May be repeated for an unlimited number of credits. Thesis/Dissertation Grading.

GEOG 601. Introduction to Geographic Theory & Application**3 Credits (3)**

This course is intended to introduce Ph.D. and Masters level students to the history, theory, methods, and contemporary literature of Geography as a discipline. It also serves to prepare incoming students to engage in an integrative, theoretically informed and applied research project. Crosslisted with: GEOG 501.

Learning Outcomes

1. Students will be able to demonstrate a clear understanding of multiple themes and topics in Geography.
2. Students will be able to demonstrate a clear understanding of multiple methods suitable for geographic research
3. Students will be able to identify and summarize recent scholarship relevant to the student's own research interests.
4. Students will be able to communicate clearly and effectively in an oral format.
5. Students will be able to communicate clearly and effectively in a written format.
6. Students will be able to identify a committee chairperson who will guide her or his graduate work.
7. Students will be able to design an integrative program of studies for the remainder of her or his graduate work.

GEOG 602. Integrative Research Design**3 Credits (3)**

This seminar focuses on the basic elements of research design, guiding students through the development of a formal proposal for original academic research. This course should be taken after GEOG 601 as part of the required course sequence for PhD students in Geography.

Prerequisite: GEOG 601.

GEOG 603. Professional Geographic Practice**3 Credits (3)**

This core course focuses on a variety of professional development topics that prepare students for teaching and applied community engagement projects. All students in this course will receive training in professional communication, professional ethics, and grant proposal writing. Depending on their individual professional goals, the course will allow students to undertake practical training in a variety of areas that range from academic teaching to applied policy work to scientific communication. All students in the joint doctoral program are expected to engage in applied projects as part of their research design, and this course will lay the foundation for these pursuits. Unlike GEOG 601 and GEOG 602, the final core course will be taught independently on each campus, to maximize the potential for faculty-student interaction on specific location-based project planning. This course will be offered every fall semester.

Prerequisite: GEOG 602.

Learning Outcomes

1. Identify professional geography as it relates to project management.
2. Explore professional communication in various settings in a variety of workplace settings.

GEOG 700. Doctoral Dissertation**1-18 Credits (1-18)**

This highly individualized independent study course is for students who have completed their comprehensive exams and are currently working on their doctoral dissertation. May be repeated up to 18 credits. Thesis/Dissertation Grading.

Learning Outcomes

1. Expand their knowledge in a specific area of interest in the discipline of geography.
2. Develop their skills in analyzing, synthesizing, and interpreting geographic data and information.
3. Develop their skills in technical and/or professional writing.
4. Develop their skills in the management and completion of a professional research project.

GEOL-GEOLOGY

GEOL 1110G. Physical Geology

4 Credits (3+3P)

Physical Geology is an introduction to our dynamic Earth introducing students to the materials that make up Earth (rocks and minerals) and the processes that create and modify the features of our planet. The course will help students learn how mountains are formed, how volcanoes erupt, where earthquakes occur, and how water, wind, and ice can shape landscapes. Students will also develop a basic understanding of the ways humans have altered the planet including our impact on natural resources and global climate change.

Learning Outcomes

1. Recall, describe or explain geologic vocabulary.
2. Identify or explain aspects of the geologic time scale and compare the uses and limitations of relative and absolute dating.
3. Recognize or explain the evidence used to support the theory of plate tectonics. Describe or identify how plate tectonics is related to the structure and features of the Earth.
4. Describe the formation of, and describe, compare, and classify minerals.
5. Identify or describe the three main rock types, how each forms in the context of the rock cycle and what each indicates about its environment of formation.
6. Recognize or explain the fundamentals of surface and groundwater hydrology and discuss the impact of human activities on water quality and quantity.
7. Describe or discuss the processes that are responsible for specific geologic hazards (e.g., earthquakes, volcanic eruptions, mass movement, flooding, etc.).
8. Recognize or describe the geologic processes involved in the formation and concentration of geologic resources.

GEOL 1150. Introduction to Rocks and Minerals

3 Credits (2+3P)

This course is an introduction to the characteristics and the formation of the three main types of rocks, the rock-forming minerals, and important ore minerals. An outline of Plate Tectonics will give students the basis to understand how many of these rocks and minerals form. In laboratory exercises, students will gain practice in describing and identifying hand-specimens of the main types of rocks and minerals.

Prerequisite(s)/Corequisite(s): GEOL 1110G.

Learning Outcomes

1. The student Identify the main rock-forming minerals from each mineral group as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise component. Studying minerals, the student will: Identify the main minerals in hand specimens; Describe the environments in which these minerals form; Identify the rock types in which these minerals are found.
2. The student will understand the structure, composition, and genesis of rocks by identifying the principal igneous, sedimentary, and metamorphic rocks, as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise components.
3. Studying rocks, the student will: Define the principal igneous processes and features, identify the most common igneous rocks and their constituting minerals in hand specimens, and discuss their origin and interpretation; Describe the principles of sedimentary processes and features, identify the most common sedimentary rocks in hand specimens, and discuss their origin and interpretation; Describe the principles of metamorphic processes and features, identify the most common metamorphic rocks and constituting minerals in hand specimens, and discuss their origin and interpretation.

GEOL 2130. Introduction to Meteorology**4 Credits (3+3P)**

Introduction to Earth's atmosphere and the dynamic world of weather as it happens. Working with current meteorological data delivered via the Internet and coordinated with learning investigations keyed to the current weather; and via study of select archives.

Learning Outcomes

1. Recall, describe, or explain the various elements of the Earth's atmosphere, Earth's relation to the sun, incoming solar radiation, the ozone layer, the primary temperature controls, and the unequal heating of land and water.
2. Recall, describe, or explain weather variables and parameters.
3. Recall, describe, or explain air masses, pressure systems, the various fronts and associated types of storms, weather symbols, monsoons, the various forms of precipitation, along with causes and effects of lightning.
4. Recall, describe, or explain the hydrologic cycle, the characteristics and influences of the oceans and continents on the weather, the Southern Oscillation (i.e., El Nino), and the effects of land/water distribution.
5. Recall, describe, or explain specific impacts by humans on weather, climate, and on the ecosystem at large.
6. Evaluate and interpret information from maps, diagrams, remote sensing devices, graphs, and tables.
7. Apply critical thinking skills such as inductive, deductive, and mathematical reasoning to solve problems using the scientific method.
8. Recognize and discuss the effect of human activity on climate, climate change and the greenhouse effect.
9. Synthesize information from external, current sources and personal observations and discuss their relationships to class material.

GEOL 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

GEOL 305V. Fossils and the Evolution of Life**3 Credits (3)**

Examination of the fossil record within the context of geologic time. Special emphasis on critical evaluation of possible terrestrial and extra-terrestrial causes for the evolution of plants and animals and for periods of mass extinction.

GEOL 310. Mineralogy**3 Credits (2+3P)**

Crystallography and the physical and chemical aspects of minerals.

Prerequisite(s): GEOL 1110G and CHEM 1215G.

GEOL 312. Mineralogy and Optics**3 Credits (2+3P)**

Principles of crystallography, optical mineralogy, and mineral chemistry as applied to the identification and characterization of rock-forming minerals. May be repeated up to 3 credits.

Prerequisite(s): GEOL 1110G and GEOL 1150.

Learning Outcomes

1. Students will understand how polarized light interacts with isotropic, uniaxial, and biaxial crystals.
2. Students will be able to recognize optical phenomena resulting from the interaction of polarized light with minerals.
3. Students will become proficient in the recognition of the major rock-forming minerals in thin section.
4. Students will recognize crystal faces according to the Miller Indices.
5. Students will be able to calculate the structural formula of any mineral.

GEOL 320. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

GEOL 335V. Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present**3 Credits (3)**

This class will provide an introduction to geologic hazards and natural disasters, their effects on society and the attempts at preparation and mitigation for these events. Hazards to be covered include earthquakes, volcanic eruptions, floods, landslides, hurricanes, tsunamis and others.

GEOL 353. Geomorphology**3 Credits (2+3P)**

Same as GEOG 353. May be repeated up to 3 credits.

GEOL 360. General Geochemistry**3 Credits (3)**

The chemistry of the earth and its parts, with emphasis on geochemical systems and cycles, distribution of the elements, and mineral equilibria. Crosslisted with: CHEM 360

Prerequisite(s): CHEM 1215G or CHEM 1120G.

GEOL 399. Igneous and Metamorphic Petrology**3 Credits (2+3P)**

Mineralogical composition, classification, and genesis of igneous and metamorphic rocks.

Prerequisite(s): GEOL 312 for geology majors, GEOL 310 for majors other than geology.

GEOL 401. Geology Colloquium**1 Credit (1)**

Presentations by visiting speakers and students. May be repeated up to 6 credits.

GEOL 420. Stratigraphy and Sedimentology**3 Credits (2+3P)**

Identification and interpretation of sedimentary rocks with emphasis on classification, deposition, and stratal geometry.

Prerequisite: GEOL 310.

GEOL 424. Soil Chemistry**3 Credits (3)**

Same as SOIL 424, CHEM 424.

GEOL 441. Tutorial Geology**2 Credits (1+3P)**

Participation in teaching lower-division laboratories and conducting tutorial sessions. May be repeated for a total of 4 credits.

Prerequisite(s): junior or above standing and nomination by faculty.

GEOL 442. Zuhl Collection Internship**1-3 Credits (3-9P)**

Applied experience with the NMSU Zuhl Collection, under supervision of the Zuhl Collection Director. Possible activities include developing displays, giving tours, developing outreach materials, etc. May be repeated up to 6 credits. Consent of Instructor required.

GEOL 444. GIS for Geology**3 Credits (3)**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOG 544.

Prerequisite(s): GEOL 470.

GEOL 449. The Geological Profession**1 Credit (1)**

Outcomes assessment exit exams. For graduating seniors only. May be repeated up to 1 credits.

Prerequisite(s): Graduating seniors only.

GEOL 452. Geohydrology**4 Credits (3+2P)**

Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits. Crosslisted with: ENVS 452 and C E 452.

GEOL 455. Undergraduate Research**1-3 Credits**

Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

GEOL 465. Isotope Geochemistry**3 Credits (3)**

Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences.

Prerequisite(s): CHEM 1225G, GEOL 360, GEOL 399.

GEOL 470. Structural Geology**3 Credits (2+3P)**

Deformation of rocks of the earth. Prerequisite: GEOL 310

GEOL 471. Volcanology**3 Credits (3)**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruption dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 571.

Prerequisite(s): GEOL 399.

GEOL 477. Special Problems**1-3 Credits**

Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits.

Prerequisite: consent of instructor.

GEOL 478. Petroleum Systems and Stratigraphy**3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments, and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips. May be repeated up to 3 credits.

Prerequisite(s): GEOL 420.

GEOL 480. Seminar**1-3 Credits**

Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

GEOL 482. Zuhl Collection Internship**1-3 Credits (1-3)**

Applied experience working with the Zuhl Collection of rocks, minerals, fossils, and petrified wood, supervised by the Director of the Zuhl Collection. Activities include tours, display development, research on aspects of the collection, and other work in the museum. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: GEOL majors.

GEOL 490. Field Geology**3 Credits (9P)**

Mapping, instrumentation, and interpretation of geology in the field.

Prerequisites: either GEOL 420 and GEOL 470.

GEOL 491. Tectonic Evolution of North America**3 Credits (3)**

Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development.

Prerequisites: GEOL 1110G, GEOL 399, GEOL 420 and GEOL 470.

GEOL 495. Geology Field Camp**4 Credits (12P)**

Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490

GEOL 499. Senior Thesis**1-3 Credits**

Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Restricted to majors.

Prerequisite: consent of instructor.

GEOL 501. Geology Colloquium**1 Credit (1)**

Presentations by visiting speakers and graduate students.

GEOL 520. Selected Topics**1-3 Credits (1-3)**

Selected topics in geology. Students must be in graduate standing to enroll. Consent of instructor required. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GEOL 534. Tectonics of Sedimentary Basins**3 Credits (3)**

Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Restricted to: GEOL majors May be repeated up to 3 credits. Prerequisite: .

Learning Outcomes

1. To be able to recognize sedimentary basin types in geologic and geomorphic environments.
2. To understand these aspects of sedimentary basins: plate tectonic setting/context, basement to basins (continental vs. oceanic/transitional lithosphere), structure and structural vergence, sedimentologic and stratigraphic signatures in the rock record, depositional systems, and basin-scale provenance.

GEOL 537. Topics in Volcanology**3 Credits (3)**

A seminar-style class exploring volcanic processes. Course topics vary by semester and include: magmatism and volcanism at different tectonic settings (subduction zones, intraplate) and plumbing systems and eruptions of volcanoes (calderas, monogenetic volcanoes).

GEOL 544. GIS for Geology**3 Credits (3)**

Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Taught with: GEOL 444. May be repeated up to 3 credits.

Learning Outcomes

1. A tools-based introduction to Geographic Information Systems software, specifically the ArcGIS package developed by ESRI.
2. Hands-on use of GIS software to make maps and analyze datasets that are commonly used by geoscientists.
3. Compiling and analyzing geologic mapping datasets collected from the field and from published literature.
4. Development of an awareness of how to find publicly accessible datasets and solutions to problems beyond the sample exercises presented in class.
5. Application of GIS to solve a problem.

GEOL 558. Neotectonics**3 Credits (3)**

Recognition, measurement, and dating of deformation related to earthquakes in the Quaternary geologic record.

GEOL 562. Analytical Geochemistry**3 Credits (3)**

Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.

GEOL 565. Isotope Geochemistry**3 Credits (3)**

Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.

GEOL 571. Volcanology**3 Credits (3)**

Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruptions dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 471.

GEOL 578. Petroleum Systems and Stratigraphy**3 Credits (2+3P)**

Sedimentation, stratigraphy, depositional environments and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips.

GEOL 582. Plate Tectonics**3 Credits (3)**

Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.

GEOL 585. Geochronology**3 Credits (3)**

The principles, analytical methods, and interpretation of the most common geochronologic methods.

GEOL 598. Special Research Programs**1-3 Credits**

Investigations into contemporary geological problems. May be repeated for unlimited credit.

Prerequisites: graduate standing and consent of instructor.

GEOL 599. Master's Thesis**15 Credits**

Thesis research.

GNDR-WOMEN'S STUDIES

GNDR 2110G. Introduction to Women, Gender, and Sexuality Studies 3 Credits (3)

This course introduces students to key concepts, debates, and analytical tools informing Women's, Gender, and Sexuality Studies. As an interdisciplinary field of study, Women's, Gender, and Sexuality Studies employs academic perspectives from a range of disciplines and theoretical approaches. It also incorporates lived experience and social location into its object of analysis. Though content will vary according to the expertise and focus of the instructor, this course will develop tools through readings and assignments that critically analyze how gender and sexuality are shaped by different networks of power and social relations and demonstrate how the intersections of race, class, disability, national status, and other categories identity and difference are central to their understanding and deployment. In addition to feminist thought, areas of focus might include gender and sexuality in relation to social, cultural, political, creative, economic, or scientific discourses. This class is recommended for those with a general interest in the topic area as well as for those seeking a foundational course for further study. May be repeated up to 3 credits.

Learning Outcomes

1. Understand foundational concepts, theories, and approaches to gender and sexuality in conjunction with contemporary social justice movements such as feminism.
2. Describe the range of social and political forces that shape and are shaped by gender, sexuality, race/ethnicity, and other intersecting categories of identity.
3. Demonstrate the ability to conduct intersectional analysis.
4. Develop and improve skills in reading, critical thinking, academic writing, and public speaking.

GNDR 2120G. Representing Women Across Cultures 3 Credits (3)

Historical and critical examination of women's contributions to the humanities, with emphasis on the issues of representation that have contributed to exclusion and marginalization of women and their achievements.

Learning Outcomes

1. To think critically about contemporary discourses on gender, race, sexuality, and class.
2. To understand how forms of identity intersect with one another
3. To explore the ways power and privilege operate in contemporary society
4. To understand some of the ways social inequalities develop, function, and change
5. To further students' interest in developing their own ideas and research in issues of women and gender, sexuality, race, class, and nation

GNDR 350. Special Topics 3 Credits (3)

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 300-level from any specific department. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GNDR 352. Women's & Mass Media 3 Credits (3)

Portrayal and participation of women in mass media from colonial to contemporary times. Taught with JOUR 380.

GNDR 357. Gender and Society 3 Credits (3)

Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives.

Learning Outcomes

1. To develop a working knowledge of sociological concepts and theoretical approaches common in gender studies, as well as the research methodologies employed to understand gender as an organizing principle in 21st century societies.
2. To develop a solid understanding of how dominant ideologies affect the structures and meanings of gender and gender inequality in the United States and on how gender shapes one's own life chances and choices.
3. To develop a decolonial "sociological imagination" and the analytical tools to understand how gender intersects with other systems of inequality (such as nation, race, ethnicity, sexuality, physical abilities, economic class, and citizenship status).
4. To develop a working knowledge of past and present collective social movements to eradicate gender inequality and gender oppression in all our homes, communities, institutions, and world.

GNDR 359. Psychology of Gender 3 Credits (3)

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: PSYC 359.

Prerequisite: PSYC 1110G.

GNDR 360. Masculinities Studies 3 Credits (3)

Explores how contemporary American culture constructs manhood and masculinity. Interrogates ideas and enactments of masculinity, especially as they intersect with race/ethnicity, class, and sexuality. The class asks how sexuality, gender construction, and sex roles inform our understanding of masculinity, as well as how masculinity relates to social power.

GNDR 371. Introduction to LGBTQ Studies**3 Credits (3)**

Multidisciplinary introduction to Lesbian, Gay, Bisexual, Transgender, and Queer Studies. Students will learn about LGBTQ identities, social movements, civil rights, and media representation.

Learning Outcomes

1. To broaden students' knowledge, cultural competencies, and research skills regarding LGBTQ+ Studies.
2. To develop a critical understanding of LGBTQ+ peoples and communities in relation to issues of power and inequality.
3. To expand understanding and learning approaches involving the study of cultural texts and arts forms created by or about LGBTQ+ experiences.
4. To develop the necessary analytical tools for further and more specialized study in the field of LGBTQ+ Studies.

GNDR 380V. Women Writers**3 Credits (3)**

Introduction to multicultural women's traditions through intensive study of works by women writers. Taught with ENGL 380V. May be repeated up to 3 credits.

GNDR 381V. Women's Health Issues**3 Credits (3)**

A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: PHLS 3120V. May be repeated up to 3 credits.

GNDR 401. Women & Immigration**3 Credits (3)**

Explores historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

GNDR 402. Transnational Feminisms**3 Credits (3)**

Explores dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

GNDR 403. Gender & Horror**3 Credits (3)**

Explores cultural anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

GNDR 405. Alternative Genders and Sexualities**3 Credits (3)**

Examination of queer, transgender, non-binary, and intersex gender identities and queer/non-heterosexual sexualities through literature, film, and critical theory

GNDR 407. Gender and Graphic Narrative**3 Credits (3)**

Examines graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

GNDR 408. Feminist Food Studies**3 Credits (3)**

Examines contemporary food writing as a way to study identity, social structures, and notions of acceptability. Explores how constructions of food shape bodies, desires, and notions of belonging.

Learning Outcomes

1. Apply critical thinking and critical writing competencies about race ethnicity, gender sexuality, and class, as well as food and culture.
2. Analyze representations of food and culinary practices in literature, film, and other cultural production as a reflection of larger social forces.
3. Develop a scholarly vocabulary for discussing themes of race and ethnicity, gender and sexuality, class, citizenship and belonging, dislocation and exile, labor and consumption.

GNDR 411. Gender and Migration**3 Credits (3)**

Explores multiple experiences of forced migration and displacement. Examines violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

GNDR 412. Gender and Film Studies**3 Credits (3)**

Examines how movies have created, reflected, and shaped ideas about gender, sexuality, race, and other dimensions of identity. This class analyzes these representations, how they create meaning, how they function within the filmic medium, and how some filmmakers create alternative visions.

Learning Outcomes

1. To develop skills to critically analyze films.
2. To gain a grounding in the analysis of social identity categories, with an emphasis on race and gender.
3. To analyze how race and gender are represented in popular culture and why media representation matters.
4. To learn critical tools to think through contemporary discourses on gender, race, and sexuality as well as categories of difference and identity.

GNDR 433V. Sex, Gender and Culture**3 Credits (3)**

This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc., expand our understanding of the various ways gender is defined across space and time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

GNDR 450. Special Topics**3 Credits (3)**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 400-level from any specific department. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GNDR 451. Women's Studies Practicum**3 Credits (3)**

Supervised field work in community setting relating to women. May be repeated up to 6 credits.

GNDR 454. Women Crossing Borders**3 Credits (3)**

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's Interactions across borders. Emphasis will vary with professor and discipline.

GNDR 455. Feminist Research Methodologies**3 Credits (3)**

Study of feminist methodologies, covering transnational decolonizing Indigenous, Chicana feminist approaches to research, such as storytelling, narrative, testimonio, platica, research-based art, performed ethnography and participatory action research.

GNDR 461. Women s Studies: Independent Study**3 Credits (3)**

Individual study of selected topic and writing of research paper. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

GNDR 465. Sex, Gender and the Body**3 Credits (3)**

Examines forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

GNDR 471. Seminar in Feminist Theory**3 Credits (3)**

Contemporary feminist inquiry and knowledge production concerning social structures and systems, lived realities, and the ways these impact each other.

Learning Outcomes

1. Demonstrate through discussion, research, and writing knowledge of shifts, differences, and debates in feminist theoretical discourse.
2. Analyze a range of contemporary feminist critical theory in discussions, essay assignments, and exams.
3. Formulate theories and forge connections between feminist discourses through written and other assignments

GNDR 474. Gender in East Asian History**3 Credits (3)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Taught with HIST 474.

GNDR 482. Gender and Popular Culture**3 Credits (3)**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

GNDR 501. Advanced Women & Immigration**3 Credits (3)**

Advanced exploration of historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

GNDR 502. Advanced Transnational Feminisms**3 Credits (3)**

Advanced analysis of dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

GNDR 505. Advanced Alternative Genders and Sexualities**3 Credits (3)**

Intensive exploration of queer, transgender, non-binary, and intersex gender identities and queer/non-heterosexual sexualities through literature, film, and critical theory.

GNDR 507. Advanced Gender and Graphic Narrative**3 Credits (3)**

Advanced examination of graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

GNDR 508. Advanced Feminist Food Studies**3 Credits (3)**

Advanced examination of contemporary food writing as a way to study identity, social structures, and notions of acceptability. Intensive exploration of how constructions of food shape bodies, desires, and notions of belonging.

Learning Outcomes

1. Apply critical thinking and critical writing competencies about race ethnicity, gender sexuality, and class, as well as food and culture.
2. Analyze representations of food and culinary practices in literature, film, and other cultural production as a reflection of larger social forces.
3. Develop a scholarly vocabulary for discussing themes of race and ethnicity, gender and sexuality, class, citizenship and belonging, dislocation and exile, labor and consumption.

GNDR 511. Advanced Gender and Migration**3 Credits (3)**

Advanced exploration of multiple experiences of forced migration and displacement. Intensive examination of violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

GNDR 512. Advanced Gender and Film Studies**3 Credits (3)**

Advanced study of how movies have created, reflected, and shaped ideas about gender, sexuality, race, and other dimensions of identity. This class analyzes these representations, how they create meaning, how they function within the filmic medium, and how some filmmakers create alternative visions.

Learning Outcomes

1. To develop skills to critically analyze films
2. To gain a grounding in the analysis of social identity categories, with an emphasis on race and gender
3. To analyze how race and gender are represented in popular culture and why media representation matters
4. To learn critical tools to think through contemporary discourses on gender, race, and sexuality as well as categories of difference and identity

GNDR 533. Advanced Issues in Sex, Gender, and Culture**3 Credits (3)**

Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. Same as ANTH 533.

Learning Outcomes

1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

GNDR 550. Special Topics**3 Credits (3)**

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 500-level from any specific department. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GNDR 554. Advanced Issues in Women Crossing Borders**3 Credits (3)**

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's interactions across borders. Consent of Instructor required.

GNDR 555. Advanced Feminist Research Methodologies**3 Credits (3)**

Advanced study of feminist methodologies, covering transnational decolonizing Indigenous, Chicana feminist approaches to research, such as storytelling, narrative, testimonio, plática, research-based art, performed ethnography and participatory action research.

GNDR 561. Independent Graduate Research in Women's Studies**3 Credits (3)**

Individual study of selected topics and writing of a research paper. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

GNDR 565. Advanced Sex, Gender & the Body**3 Credits (3)**

Advanced examination of forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

GNDR 571. Advanced Seminar in Feminist Theory**3 Credits (3)**

Intensive study of contemporary feminist inquiry and knowledge production concerning social structures and systems, lived realities, and the ways these impact each other.

Learning Outcomes

1. Students will be able to demonstrate through discussion, research, and writing knowledge of shifts, differences, and debates in feminist theoretical discourse.
2. Students will be able to analyze a range of contemporary feminist critical theory in discussions, essay assignments, and exams.
3. Students will be able to formulate theories and forge connections between feminist discourses through written and other assignments

GNDR 582. Gender and Popular Culture**3 Credits (3)**

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

GPHY-GEOPHYSICS

GPHY 450. Selected Topics**1-3 Credits**

Readings, discussions, lectures or laboratory studies of selected areas of geophysics. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

GPHY 520. Selected Topics**1-3 Credits**

Formal treatment of graduate topics not covered in regular courses. May be repeated for unlimited credit.

Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

GPHY 560. Applied Inverse Theory**3 Credits (3)**

Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, over determined and under determined problems, linear and nonlinear problems. Computing experience desirable. Consent of Instructor required.

GPHY 598. Special Research Problems**1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for unlimited credit.

GPHY 599. Master's Thesis**1-15 Credits (1-15)**

Thesis.

GPHY 620. Advanced Topics in Geophysics**3 Credits (3)**

Advanced formal treatment of a topic or topics not covered in regular courses. May be repeated for unlimited credit.

Prerequisite: consent of instructor.

GPHY 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation.

GREX-GRAD CROSS UNIV EXCH

GREX 600. Graduate Cross University Exchange**1-9 Credits**

GRMN-GERMAN

GRMN 1110. German I**4 Credits (4)**

Intended for students with no previous exposure to German, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-mid level. This is an introductory course designed to teach the student to communicate in German in everyday situations and to develop an understanding of German cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.

Learning Outcomes

1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can write lists and memorized phrases on familiar topics.
3. Students can recognize some familiar words and phrases when they hear them spoken.
4. Students can recognize some letters or characters.
5. Students can understand some learned or memorized words and phrases when they read.
6. Students can identify beliefs, behaviors and cultural artifacts of the German-speaking world.
7. In English, students will engage with social issues confronting the German-speaking world to develop their sense of personal and social responsibility

GRMN 1120. German II**4 Credits (4)**

A continuation of German 1, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing German aiming toward the ACTFL novice-high level. This course is designed to increase student fluency in German as applied to everyday situations. Students will also learn to recognize and understand various German products, practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues.

Prerequisite(s): C or better in GRMN 1110.**Learning Outcomes**

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts of the German-speaking world.
9. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2110. German III**3 Credits (3)**

In this third semester course, students will continue to develop a broader foundation in skills gained during the first two semesters, including understanding, speaking, reading and writing German aiming toward the ACTFL intermediate-low level. This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various German products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives.

Prerequisite(s): C or better in GRMN 1120.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and discuss the nature and value of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2120. German IV**3 Credits (3)**

In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing German aiming at the ACTFL intermediate-mid level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various German products, practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction.

Prerequisite(s): C or better in GRMN 2110.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and recognize and discuss the representations and controversies of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to create ways to demonstrate their sense of personal and social responsibility.

GRMN 305. Topics in German Culture**3 Credits (3)**

Group study of selected topics focusing on German culture and civilization. This course is linked to FLiP courses (Faculty-Led international Programs) when applicable. Topics identified by subtitle in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics.

Learning Outcomes

1. (Language) Students will show more confidence in their German speaking, listening and writing abilities.
2. (Culture): Students will demonstrate knowledge of the culture of German institutions, of Berlin (through reflection and discussion sessions) after visits to historical, architectural and cultural sites as well as direct interaction with the locals.
3. (Culture): Students will demonstrate competence at navigating a culture different from their own.
4. (Culture): Students will demonstrate (through reflection and discussion sessions) a greater appreciation for the diversity of German identity.

GRMN 313. Intermediate Composition and Grammar**3 Credits (3)**

A review of the rules of German grammar. Development of written German skills. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Students will show their improvement in writing skills in German through the application of accurate grammar rules practiced in the course.
2. Students will show their improvement in vocabulary usage in German by using more varied and appropriate vocabulary in their writing.
3. Students will show their improvement in writing organization.

GRMN 325. German Conversation I**3 Credits (3)**

Intensive oral communication practice. Not open to heritage/native speakers of German. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to demonstrate a quantifiable increase in your conversational skills by comparing your their final score (post-test) to their score in the oral pre-test, taken on the first/second day of classes.
2. This means being able to communicate their thoughts, opinions, emotions, etc. as they intend them to be understood by others. AND to be able to understand what others are saying to them so they can respond accordingly better than they did at the beginning of the course, according to the ACTFL Oral Proficiency (OPI) standards.

GRMN 330. Business German**3 Credits (3)**

An introduction to standard language within the corporate world in German-speaking countries. During the semester, students will practice reading, writing, listening, speaking and expanding their vocabulary in the fields related to business, technology (ex. Engineering) and health (ex. Nursing, Psychology, etc.).

GRMN 340. Introduction to Translation**3 Credits (3)**

General aspects of Translation from German to English and English to German. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate understanding of the concept of translation by reading translation theory.
2. Demonstrate an enhanced knowledge of German as related to translation practices.
3. Demonstrate the ability to use specialized vocabulary and concepts in various professional areas.
4. Demonstrate knowledge of the translator's place as a professional.
5. Develop and enhance their linguistic competence and cultural awareness.

GRMN 341. German Folklore and Culture**3 Credits (3)**

Customs, traditions, mythology, folk literature and art. Special focus on Grimms' fairy tales. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate improvement in reading skills in German by one ACTFL level by augmenting vocabulary, grammatical accuracy, and reading comprehension skills.
2. Describe the 5 basic motifs in folktales (FT) and where they supposedly come from.
3. List and define the 9 types of FT (Teverson) according to their functions.
4. Discuss the impact of the enlightenment in the structure of FT, Evaluate the influence of the industrial revolution and the development of a bourgeois society in FT.
5. Critique the position of the present-day, pop-cult media in its recently created versions of FT.

GRMN 350. Introduction to German Literature**3 Credits (3)**

Basic literary genres and major figures in German language literature from its beginnings to the 19th century. GRMN 2120 or equivalent is recommended. To be followed by GRMN 471 - Studies in German Literature. May be repeated up to 3 credits. Consent of Instructor required.

Learning Outcomes

1. Demonstrate an improvement on reading skills in German by one ACTFL level by augmenting active vocabulary, grammatical accuracy and reading comprehension skills.
2. Describe the authors, styles and basic discourses of 3 periods of German-language literature (old and middle high German from early the medieval literature, the protestant reformation; High German and literature academies: the fifteenth to seventeenth Centuries; and the Eighteenth Century.

GRMN 399. Intermediate Independent Study in German**1-3 Credits (1-3)**

Tutorial in reading, writing and oral expression for intermediate-level students of German. Topics identified in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics. May be repeated up to 6 credits. Consent of Instructor required.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 410. Practicum in Conversational German**1-3 Credits**

Intensive oral communication practice for students with a strong German language foundation. May be repeated up to 6 credits.

Prerequisite(s): GRMN 325 or consent of instructor.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 413. Advanced Composition and Grammar**3 Credits (3)**

Exercises in written German with emphasis on stylistic features.

Prerequisite: GRMN 313 or consent of instructor.

GRMN 425. Advanced German Conversation**3 Credits (3)**

Advanced conversation through intensive oral practice.

Prerequisite(s): GRMN 325 or consent of instructor.

GRMN 451. Special Topics in German**1-3 Credits**

Selected topics to be identified by subtitle in the Schedule of Classes.

May be repeated for up to 6 credits with different topic. May be repeated up to 12 credits.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 453. Independent Studies in German**1-3 Credits (1-3)**

Individualized, self-paced research projects for advanced-level students of German. Topics identified by subtitle in the Schedule of Classes.

GRMN 2120 or equivalent is recommended. May be repeated up to 12 credits.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 455. German for Specific Purposes**1-3 Credits (1-3)**

Directed reading for students to satisfy language requirements for master's and doctoral programs. Topics identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

HIST-HISTORY

HIST 1105G. Making History**3 Credits (3)**

General introduction to history: how historians carry out research and develop interpretations about the past.

Learning Outcomes

1. Understand and articulate the differences and similarities between history and memory;
2. Analyze and critically interpret primary sources and understand how others might interpret and use the same material in different ways;
3. Recognize and appreciate the diversity of historical experiences and the uses of historical memory in various societies;
4. Understand how historical experiences that include political, geographical, social, cultural, religious and intellectual experiences have been expressed across historical periods;
5. Understand how historical experiences and memories have shaped contemporary societies;
6. Identify and understand the degree to which history has been used and misused in the past;
7. Demonstrate improvement in their ability to read critically, think logically, and express themselves clearly in writing.

HIST 1110G. United States History I**3 Credits (3)**

The primary objective of this course is to serve as an introduction to the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply 8
6. Students will APPLY historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 9

HIST 1120G. United States History II**3 Credits (3)**

The primary objective of this course is to serve as an introduction to the history of the United States from reconstruction to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the reconstruction to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 10 11

HIST 1130G. World History I**3 Credits (3)**

The primary objective of this course is to serve as an introduction to global history from ancient times to the 16th century. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for global history from ancient times to the 16th century. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1140G. World History II**3 Credits (3)**

The primary objective of this course is to serve as an introduction to global history from the 16th century to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of global history from the 16th century to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will Apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1150G. Western Civilization I**3 Credits (3)**

This course is a chronological treatment of the history of the western world from ancient times to the early modern era. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from ancient times to the early modern era. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. BloomTaxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 14

HIST 1160G. Western Civilization II**3 Credits (3)**

This course is a chronological treatment of the history of the western world from the early modern era to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from the early modern era to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1170. Survey of Early Latin America**3 Credits (3)**

The primary objective of this course is to serve as a survey of the history of Latin America from pre-Columbian times through independence. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create. apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: apply, analyze

HIST 1180. MODERN LATIN AMERICA**3 Credits (3)**

The primary objective of this course is to serve as a survey of the history of Latin America from independence to the present. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create. apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: apply, analyze

HIST 2110. Survey of New Mexico History**3 Credits (3)**

The primary objective of this course is to serve as an introduction to the history of New Mexico from the pre- Columbian times to the present day. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of New Mexico within the context of the Americas.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of New Mexico from pre-Columbian times to the present day. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating, credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 16

HIST 2245G. Islamic Civilizations to 1800**3 Credits (3)**

History of Islamic civilizations to 1800.

Learning Outcomes

1. By the conclusion of the course, the student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the seventh to the sixteenth century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West;
3. Critically read and evaluate historical evidence with the goal of forming an argument about historical evidence
4. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 2246G. Islamic Civilizations since 1800**3 Credits (3)**

History of Islamic civilizations since 1800.

Learning Outcomes

1. By the conclusion of the course, the student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the sixteenth century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West;
3. Critically read and evaluate historical evidence with the goal of forming an argument about historical evidence
4. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 2250G. East Asia to 1600**3 Credits (3)**

History of China, Korea, Vietnam, and Japan from earliest times through the sixteenth century. Emphasis on cultural and political developments and their social and economic contexts, and the interaction between East Asian societies.

Learning Outcomes

1. Students will learn the analytic skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2251G. East Asia since 1600**3 Credits (3)**

History of China, Korea, Vietnam, and Japan from the sixteenth through the twentieth centuries. Emphasis on internal development of each country, as well as the social and political impact of Western Imperialism, and the emergence of each country's unique version of modern society.

Learning Outcomes

1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2996. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes.

Community Colleges only. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

HIST 300. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

HIST 302V. Science in Modern Society**3 Credits (3)**

The social impact of scientific activity and thought from Newton to the present. The growth of modern scientific institutions; the political and social context of modern science. ENGL 1110G recommended.

HIST 308V. The History of Food**3 Credits (3)**

From the earliest uses of fire for cooking up through our modern age of fast food and organic gardening, human culinary traditions have long shaped and been shaped by the forces of history. This course offers a general overview of the history of food production and consumption in the West from prehistoric times through the 21st century, with a special focus on the various ways in which social and political history have impacted dining, taste, and cooking. Among a great variety of topics, we will focus on the origins of cooked food; ancient Hebrew dietary laws; the "spice revolution" and the great influence of Arabic cuisine on the kitchens of medieval Europe; emerging ideas about etiquette and table manners including the use of the fork; the advent of print and the first printed cookbooks; the Columbian Exchange and the arrival of foods from the New World; the rise of French cuisine; food and immigration; the global dominance of fast food; and sustainable food production and consumption in the modern era. We will pay a special emphasis throughout the course to the myriad ways in which food production and consumption in history have always been gendered, as well as influenced by ideas about social class.

Learning Outcomes

1. Master a general master narrative about the history of food in the Western World, including a variety of European countries;
2. Analyze the relationship between food and culture in a variety of countries and traditions;
3. Critically read and learn to evaluate secondary historical literature, grasping the strengths and weaknesses of historical monographs; and
4. Communicate a historical argument logically and effectively in a 20-page original research paper.

HIST 311V. Colonial Latin America**3 Credits (3)**

Social, political, and economic development from Columbus to the Wars of Independence. Research paper required.

HIST 312V. Modern Latin America**3 Credits (3)**

Post-revolutionary developments in the nineteenth and twentieth centuries; the role of Latin America in world affairs and the Inter-American system. Research paper required.

HIST 313. Making the American West**3 Credits (3)**

Development of the American West from 1803 to 1900 with emphasis on conquest, federal and corporate roles in western development, environmental change, and the Mythic West. Includes meetings outside regular class time to view feature-length films.

HIST 320. American History Through Film**3 Credits (3)**

This course uses feature films as texts to examine the depiction of major themes and events in American history and society. It considers both the accuracy of these depictions, and the way in which the historical viewpoint of feature films is influenced by factors including directorial point of view and popular memory. It also examines the influence of feature films on popular understandings of the American past. May be repeated up to 3 credits.

Learning Outcomes

1. Students will critically analyze and evaluate the accuracy and truthfulness of cinematic representations of episodes in U.S. history, and convey these analyses and evaluations orally and in writing.
2. Students will evaluate contemporary claims made concerning the value of films for historical understanding, and convey these analyses and evaluations orally and in writing.
3. Students will assess the ways in which films serve as historical documents that illuminate the cultural, social, and political history of the eras in which they were produced, and convey these analyses and evaluations orally and in writing.

HIST 321V. History of Korea**3 Credits (3)**

Social, political, and cultural history of Korea from earliest times through twentieth century. Emphasis on the interaction between Korean traditions and influences from China and the West. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will also understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will examine how people shape their culture and beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationships between science and technology and human values and behavior.

HIST 323. Cultural History of Later Imperial China**3 Credits (3)**

Covers art and literature of China from the Tang Dynasty (618-907) through the eighteenth century. Developments in cultural theory and practice are traced in the context of the social and economic changes fostering an understanding of Chinese cultural history and its legacy in East Asia today.

HIST 329. History of Egypt**3 Credits (3)**

History of Egypt from ancient times to the present.

HIST 330V. Introduction to Religious Studies**3 Credits (3)**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. May be repeated up to 3 credits.

HIST 331. Rebels, Guerrillas, and Terrorists in Modern Latin America**3 Credits (3)**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Colombia's FARC, and Mexico's Zapatistas. Same as POLS 468.

HIST 333. Renaissance Europe**3 Credits (3)**

This course explores the cultural, social, and political developments of early modern Europe between 1350-1650. This period witnessed a dramatic transformation between the medieval and modern worlds: a transition marked by new historical and artistic visions, the invention of the printing press, the discovery of the New World, the permanent fracturing of Christianity during the Protestant Reformation, the scientific revolution, and the rise of capitalism as a world system. We will consider these and other transformations in this time period both as they were understood by elite society as well as the impact of these innovations upon the daily lives of everyday people and women in particular.

Learning Outcomes

1. Identify the key historical facts, values, and ideas that shaped the history of Europe between 1400–1650;
2. Analyze the causes and effects of the Renaissance, the Age of Encounters, the Reformation, and the Scientific Revolution;
3. Identify the major artistic, literary, and technological contributions of individuals during this time period;
4. Describe how cultural exchanges reveal the global context of events in early modern Europe; and
5. Create well-supported historical arguments based on primary and secondary source evidence.

HIST 334. Art and Life in Renaissance Italy**3 Credits (3)**

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ARTH 444.

HIST 338. World War I**3 Credits (3)**

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war.

HIST 339. World War II**3 Credits (3)**

Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement.

HIST 343. Recent American Military History**3 Credits (3)**

Emphasis on American wars since the Civil War, and on factors contributing to the development of modern military systems.

HIST 347. Civil War Era 1840-1877**3 Credits (3)**

Mexican-American War, development of secession, American Civil War, Reconstruction.

HIST 356. The Mexican Revolution**3 Credits (3)**

Examines the history of modern Mexico through the lens of the Mexican Revolution, 1910-1920. Course covers military, political, social, cultural and economic developments that shaped Mexico during and after the Revolution.

HIST 361. African American History to 1877**3 Credits (3)**

African background, slave trade, slavery; Civil War and Reconstruction; free blacks in a white society to about 1900. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period from the great African Empires (circa 900CE) to the end of the period of Reconstruction (1877), with particular focus on the experiences of African Americans.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 362. African American History, 1865-present**3 Credits (3)**

Black Americans in the United States in the twentieth century; segregation; black leaders, organizations, methods and goals; white reaction; the struggle for equality. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period of the Civil Rights Movement through readings, interaction with primary source documents, essays, and discussions.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 366V. British Imperialism**3 Credits (3)**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

HIST 368. Teaching History**3 Credits (3)**

Philosophical and practical issues of teaching history are explored. Designed to help prospective teachers at all levels clarify their views about studying history. A variety of pedagogical strategies for teaching history are explored.

**HIST 371. Greek Civilization: From Helen of Troy to Alexander the Great
3 Credits (3)**

This course provides a survey of Greek history from the Trojan War through the conquests of Alexander the Great. Topics include the formation of the Greek city-states with a focus on Sparta and Athens and the wars between them, the invention of democracy in Athens, the birth of the discipline of history, the development of philosophy, the trial and death of Socrates, and the spread of Greek culture to the borders of India because of the conquests of Alexander the Great. We will explore most aspects of Greek society, using Greek authors and artists to introduce much of the material. Attention is paid to the everyday life of ancient Greeks not just power politics. May be repeated up to 3 credits.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Greek history through a variety of primary sources, including works of literature and art.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

**HIST 372. Roman Civilization
3 Credits (3)**

In this course we will explore the growth of Rome from a village in the Italian peninsula to a global empire stretching from Spain to Syria and Britain to the sands of the Sahara. We will focus on the development of political, social, and cultural institutions in the construction of the Roman Republic and the enormous military conquests of that period. We then examine the transformation of the Republic into an empire, governed by an emperor. Finally, we analyze the rise of Christianity in the Roman world and the Roman empire's decline in the 5th century C.E. Attention is paid to the everyday life of ancient Romans not just power politics. May be repeated up to 3 credits.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Roman history through a variety of primary sources.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

**HIST 373. Islam and the West: Cultural Contacts, Conflicts, and Exchanges
3 Credits (3)**

This course examines interactions, encounters, and cross-fertilization between the Islamic world and the West from the 7th– 21st century. Topics include the relationship of Islam to Judaism and Christianity, the rise of an Islamic empire and the development of Islamic civilization, the Crusades, the impact of Islamic culture on Europe and the Italian Renaissance. It also explores the shifting relationships between Muslims, Christians, and Jews throughout this period.

Learning Outcomes

1. Student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the seventh to the early twenty-first century.
2. Students will be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West.
3. Students will critically read and evaluate historical evidence with the goal of forming an argument about historical evidence.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

**HIST 374V. The European City: History and Culture
3 Credits (3)**

Course presents the rich, complex history and cultures of European cities from ancient to modern times, linking these cities to crucial issues in European history. Crosslisted with HNRS 374V, GEOG 374V, POLS 374V.

**HIST 379V. The History of Italy from the Etruscans to the Mafia
3 Credits (3)**

Italy is beloved by many, for its food, language, and art; however, we often understand it only superficially, and often fail to grasp the darker elements of its history. This class will consider the history of the Italian peninsula from the time of its earliest inhabitants, the Etruscans, up through the twenty-first century. We will consider topics such as the Roman world and its legacy, the rise of Christianity, the growth of medieval towns and their economies, Renaissance, the Risorgimento or the formation of the modern nation of Italy, Italian fascism, the wars of the twentieth century, Italian film, the history of Italian food including pizza and pasta, Italian communism, and the growth of organized crime and the mafia. Special attention will be paid throughout to the relationship between Northern and Southern Italy, as well as the special city of Venice and its relationship to the rest of the peninsula.

Learning Outcomes

1. Master a general master narrative about the history of Italy from its earliest inhabitants through the twenty-first century
2. Identify a variety of developments in the history of Italian culture, including art, literature, food, and film;
3. Critically read and evaluate primary and secondary historical sources and
4. Communicate a historical argument logically and effectively in a 15-page original research paper.

**HIST 382V. Modern Russia
3 Credits (3)**

Domestic policies and foreign relations from mid-nineteenth century to the present with emphasis on the Soviet period.

**HIST 383. Germany
3 Credits (3)**

Political, social, and cultural developments from the eighteenth century to the present, with emphasis on the Nazi era. Same as POLS 473.

HIST 386. New Mexico History**3 Credits (3)**

Economic, political and social development of New Mexico from exploration to modern times.

HIST 387. Spain in the New World: Conquest, Conflict, and Cultural Exchange**3 Credits (3)**

The history of Spain, with a focus on Spain's interaction with the New World. May be repeated up to 3 credits.

Learning Outcomes

1. The student will be able to demonstrate a knowledge of the history of Spanish contacts, conquests, and influences in the New World from the late fifteenth century until the early twenty first century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Spain and the New World; Critically read and evaluate historical evidence in order to construct past events;
3. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 390V. The Holocaust**3 Credits (3)**

The attack upon European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession to chancellor in 1933 until the end of the Third Reich in 1945.

HIST 397. Introduction to Public History**3 Credits (3)**

Surveys how historians do history in museums, archives, government agencies, and in communities. Hands-on experience provides students a better understanding of history and how historians work outside of the classroom. Seminar project required.

HIST 398. Historians and History**3 Credits (3)**

General historiography and philosophy of history; historical methodology, research, and writing; bibliographical aids and their uses. May be repeated up to 3 credits. Restricted to: HIST majors.

HIST 400. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

HIST 402. Special Topics in European History**3 Credits (3)**

Special topics in European history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 403. Special Topics in Middle Eastern History**3 Credits (3)**

Special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 404. Special Topics in Asian History**3 Credits (3)**

Special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 406. Special Topics in United States History**3 Credits (3)**

Special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 413. Native American History**3 Credits (3)**

Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

HIST 414. The Constitution and U.S. History**3 Credits (3)**

This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a major project of historical synthesis at the end of the semester.

HIST 428. History of Terrorism in Modern Europe and the Middle East**3 Credits (3)**

Analyzes causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas and Hezbollah in the contemporary Middle East and beyond.

HIST 431. History of Race and Ethnicity**3 Credits (3)**

Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.

HIST 432. United States Labor History to 1877**3 Credits (3)**

Seminar discussions explore United States labor and working-class history to 1877, including such topics as pre-industrial and industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

HIST 433. United States Labor History Since 1877**3 Credits (3)**

Seminar discussions explore United States labor and working-class history since 1877, including such topics as industrial labor, debt peonage, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state. May be repeated up to 3 credits.

HIST 434. Urban History**3 Credits (3)**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

HIST 435. History of War and Revolution**3 Credits (3)**

Seminar covers historical dynamics of violent social, political, and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 438. Antiquity and Modernity**3 Credits (3)**

Seminar explores links between earlier and more recent historical periods. Examples may include the Renaissance rediscovery of ancient Rome or the early modern Chinese reassessment of its classical Confucian heritage. Readings include ancient sources and the modern reception of such works, and the scholarly assessment of these processes. Individual research projects required in areas of student interests.

HIST 443. The Cold War in Latin America**3 Credits (3)**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

HIST 448. Nuclear Nation**3 Credits (3)**

Explores post-World War II history and the impact atomic energy has had on the United States and the world.

HIST 449. Readings**1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

HIST 453. Cuba: Colony to Castro**3 Credits (3)**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean with emphasis on recent events.

HIST 471. China through the Ming Dynasty**3 Credits (3)**

History of China from origins to Ming dynasty, (1368-1644). Cultural and political development with emphasis on social and economic contexts and long term trends.

HIST 472. China in the Modern World**3 Credits (3)**

History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.

Learning Outcomes

1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations.
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 473. History of Japan**3 Credits (3)**

History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.

HIST 474. Gender in East Asian History**3 Credits (3)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as GNDR 474.

HIST 475. History of the Global Political Economy**3 Credits (3)**

Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 478. History of Transportation: Planes, Trains and Automobiles**3 Credits (3)**

The course examines the impact of changes in transportation technology on society from the 19th century to the present, with a focus on the Americas, both the United States and Latin America. Revolutionary changes such as the railroad, the steamship, and later the automobile and the airplane changed the way that people lived, worked and interacted with others.

Learning Outcomes

1. Analyze primary sources by placing them into historical context.
2. Improve writing skills using Chicago style of writing.
3. Explain the nature of technological change in history and its impact in society.
4. Relate historical events to current-day debates about transportation.
5. Practice team-work through Team Based Learning method.

HIST 479. Oral History**3 Credits (3)**

Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.

HIST 483. Historic Preservation**3 Credits (3)**

Study of community development, the historic preservation movement, and the built environment. Field project.

HIST 486. Interpreting Historic Places for the Public**3 Credits (3)**

Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

HIST 489. Projects in History**3 Credits (3)**

Individual projects in history. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

HIST 500. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated for a maximum of 12 credits.

HIST 504. Civil War Era, 1840-1877**3 Credits (3)**

Mexican-American War, development of secession, American Civil War, Reconstruction. Graduate research paper required.

HIST 511. Making the American West**3 Credits (3)**

Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.

HIST 514. The Constitution and U.S. History**3 Credits (3)**

This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a 10-12 page research paper in which they will integrate and extend learned material.

HIST 523. The History of Food**3 Credits (3)**

Considers the history of the production and consumption of food in the West from the Neolithic Age to the present with an emphasis on the historical relationships between food, gender, social class, social identity and nationalism.

HIST 527. Labor History**3 Credits (3)**

Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.

HIST 528. History of Terrorism in Modern Europe and the Middle East**3 Credits (3)**

Advanced analyses of causes, methods, and consequences of terrorism in Europe and the Middle East from the Reign of Terror in the French Revolution to Al-Qaeda, Hamas, and Hezbollah in the contemporary Middle East and beyond.

HIST 535. War and Revolution**3 Credits (3)**

Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 538. Special Topics in European History**3 Credits (3)**

Advanced special topics in European history to be announced in the schedule of classes. May be repeated for a maximum of 12 credits.

HIST 540. Special Topics in Middle Eastern History**3 Credits (3)**

Advanced special topics in Middle Eastern history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 543. Special Topics in Asian History**3 Credits (3)**

Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 545. Special Topics in United States History**3 Credits (3)**

Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

HIST 548. Nuclear Nation**3 Credits (3)**

Explores post-World War II history and the impact that atomic energy has had on the United States and the world.

HIST 549. Graduate Readings**1-3 Credits**

Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

HIST 553. Cuba: Colony to Castro**3 Credits (3)**

Economic, social, and political development of Cuba and other colonies and nations in the Caribbean, with emphasis on recent events. Graduate research paper required.

HIST 557. The Mexican Revolution**3 Credits (3)**

Origins, causes, and scope of the Mexican Revolution, including leading personalities, with emphasis on the U.S.-Mexican border. Graduate research paper required.

HIST 566. British Imperialism**3 Credits (3)**

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

HIST 568. Urban History**3 Credits (3)**

Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.

HIST 570. The Cold War in Latin America**3 Credits (3)**

Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.

HIST 571. China through the Ming Dynasty**3 Credits (3)**

History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.

HIST 572. China in the Modern World**3 Credits (3)**

Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 573. History of Japan**3 Credits (3)**

Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.

HIST 574. Gender in East Asian History**3 Credits (3+2P)**

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature (in translation) and cinema used. Same as GNDR 574.

HIST 575. History of the Global Political Economy**3 Credits (3)**

Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 578. Modern Russia**3 Credits (3)**

Domestic policies and international relations from the mid-nineteenth century to the present with emphasis on the Soviet experience.

HIST 579. Oral History**3 Credits (3)**

Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.

HIST 580. Graduate Research Projects**1-6 Credits (1-6)**

Intensive investigation of a selected area of history, including the completion of a research paper or a public history project. Consent of instructor required.

HIST 583. Advanced Historic Preservation**3 Credits (3)**

Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.

HIST 585. Public History Internship**3 Credits (3)**

Individual project in an area of public history, including a final written report. Research project required. May be repeated for a maximum of 9 credits.

Prerequisite: consent of instructor.

HIST 586. Interpreting Historic Places for the Public**3 Credits (3)**

Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

HIST 590. Reading Seminar: Borders, Boundaries and Frontiers**3 Credits (3)**

Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program.

HIST 591. Reading Seminar: Modernity and its Discontents**3 Credits (3)**

Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.

HIST 592. Reading Seminar: Nature and Society**3 Credits (3)**

Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.

HIST 593. Reading Seminar: History, Myth and Memory**3 Credits (3)**

Course analyzes the complex and often contested process of writing national histories, creating national heroes, and forging collective memories. Students assess written texts, memorials, parades and celebrations.

HIST 594. Public History Seminar**3 Credits (3)**

Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.

HIST 596. Research Seminar**3 Credits (3)**

Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.

HIST 597. Public History Article**1-9 Credits (1-9)**

Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.

HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f)**3 Credits (3)**

Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.

HIST 599. Master's Thesis**1-15 Credits (1-15)**

Thesis.

HIT-HEALTH INFO TECHNOLOGY

HIT 110. Electronic Health Records**3 Credits (3)**

Current electronic health record principles, methods and procedures, and computerized medical record concepts and software applications will be introduced. Restricted to: Community Colleges only.

HIT 120. Health Information Introduction to Pharmacology**3 Credits (3)**

Introduction to the principles of pharmacology, including drug terminology; drug origins, forms, and actions; routes of administration; as well as the use of generic name drugs, trade name drugs and categories of drugs to treat multiple and specific body systems. May be repeated up to 3 credits. Crosslisted with: NURS 120. Restricted to Community Colleges campuses only.

HIT 130. Health Information Technology Anatomy & Physiology**3 Credits (3)**

An introductory course in the basics of human structure and function. Body systems are examined as to how they relate to proper code selection and as part of the functioning of the body as a whole. Restricted to Community Colleges campuses only.

HIT 140. Health Information Introduction to Pathophysiology**3 Credits (3)**

Introduction to the nature of disease and its effect on body systems. Disease processes affecting the human body via an integrated approach to specific disease entities will be presented including a review of normal functions of the appropriate body systems. Diseases will be studied in relation to their etiology, pathology, physical signs and symptoms, diagnostic procedures, complications, treatment modalities and prognosis.

HIT 150. Introduction to Medical Terminology**3 Credits (3)**

The study and understanding of medical terminology as it relates to diseases, their causes and effects, and the terminology used in various medical specialties. Emphasis will be placed on learning the basic elements of medical words, appropriate spelling and use of medical terms, and use of medical abbreviations. May be repeated up to 3 credits. Crosslisted with: NURS 150, AHS 120 and BOT 150. Restricted to Community Colleges campuses only.

HIT 158. Advanced Medical Terminology**3 Credits (3)**

Builds upon the concepts covered in HIT 150 or AHS 120 providing greater understanding of how to properly use and apply medical terminology used in the various health fields. Medical terminology associated with the body system's anatomy and physiology, pathology, diagnostic and therapeutic procedures, pharmacology, and abbreviations will be emphasized. Restricted to Community Colleges campuses only.

Prerequisite(s): HIT 150 or AHS 120.

HIT 221. Internship I**3 Credits (3)**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. C- or better is required for this course. Consent of Instructor required. Restricted to: BOT, HIT majors. Restricted to Community Colleges campuses

HIT 228. Medical Insurance Billing**3 Credits (3)**

Comprehensive overview of the insurance specialist's roll and responsibilities. Concepts and applications that will assist the student in understanding the steps necessary for successfully completing the insurance claim filing and reimbursement processes for various insurance carriers, both private and government, will be emphasized. Restricted to Carlsbad campus only.

Prerequisite(s): HIT/NURS 150; BOT 208.

HIT 240. Health Information Quality Management**3 Credits (3)**

Introduction to basic concepts of quality improvement and performance improvement as they apply to health record systems and the health care industry. Quality assessment and improvement standards and requirements of licensing, accrediting fiscal and other regulatory agencies will be presented.

HIT 248. Medical Coding I**3 Credits (2+2P)**

Comprehensive overview of the fundamentals, coding conventions, and principles of selecting the most appropriate ICD-10-CM/PCS diagnostic and procedure codes. The most recent version of ICD-10-CM/PCS and an in depth study of current Official Coding Guidelines for coding and reporting will be emphasized. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): BOT 228.

HIT 255. Special Topics**3 Credits (3)**

Specific topics to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

HIT 258. Medical Coding II**3 Credits (2+2P)**

Continuation of Medical Coding I. Comprehensive overview of the coding and reporting guidelines, fundamentals, coding conventions, and principles of selecting the most appropriate CPT and HCPCS procedural codes for all medical specialties. The most recent version of CPT and a continued study of the ICD-10-CM/PCS coding conventions and principles will be emphasized. Designed as a medical coding capstone course. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): HIT 248.

HIT 268. Health Information Systems**3 Credits (3)**

Overview of health data management, work planning, and organization principles; an introduction to health care information systems; and review of the fundamentals of information systems for managerial, clinical support, and information systems.

HLED-HEALTH EDUCATION

HLED 1154. Lifeguarding**2 Credits (2)**

Skills training for a nonsurf lifeguard. Course will include Standard First Aid and CPR certification. May be repeated up to 2 credits.

Learning Outcomes

1. To help the student become aware of the common hazards associated with various types of aquatic facilities and to develop the knowledge and skills to eliminate or minimize such hazards.
2. To help the student develop the skills necessary to recognize a person in distress or in a drowning situation and to effectively rescue that person.
3. To help the student understand their responsibility to their employer, fellow employees and especially to the patrons of their facility.
4. To provide explanations, demonstrations, practice and review of the rescue skills essential for lifeguarding.
5. To instill in the students an understanding and appreciation for the responsibilities, swimming skills and additional duties of lifeguarding.
6. To develop more advance swimming skills to assist in a water rescue.

HMSV-HUMAN SERVICES

HMSV 2110. Case Management**3 Credits (3)**

This course introduces students to the concept of case management, how it is used in human services, and skills necessary to function effectively as case managers. The emphasis is on the client assessment process, service planning and delivery, and client advocacy. Topics introduced include observation, data collection, documentation, and reporting of client behaviors, identification and referral to appropriate services, monitoring, planning, and evaluation. This course provides student with basic knowledge and beginning case management skills. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G and SOWK 2110G.

Learning Outcomes

1. Define the purpose of case management and explain the role of the case manager
2. Explain the process of case management and what it entails
3. Explain the ethical, professional and legal responsibilities of case managers
4. Describe several settings within which case management takes place
5. Apply principles of client record management, and protect client rights to privacy and confidentiality
6. Use data to determine the appropriate referral service to professional, agencies, community programs or other resource, and clearly and specifically explain the referral service's role in treatment and contact information
7. Apply standards of clinical evaluation, including establishing rapport, data gathering and screening, analysis of substance abuse implications, treatment possibilities, initial actions, and documentation of findings and treatment recommendations
8. Incorporate individual and cultural relevance in concert with established situation-specific policies and procedures for crisis management.

HNRS-HONORS

HNRS 1110. Journeys of Discovery**1 Credit (1)**

Weekly conversations among students and a faculty member; organized around a particular subject and a small selection of readings. The seminars illuminate the many paths of discovery explored by the New Mexico State University faculty.

Prerequisite(s): Honors eligible.

Learning Outcomes

1. Students will comprehend and condense information to contribute to class discussions.
2. Students will develop public speaking and presentation skills based on research conducted in and outside of class.
3. Students will expand upon collaborative skills as both group presentations and group written reports.

HNRS 1115. Honors First Year Seminar**3 Credits (3)**

This course is designed to introduce new first semester students to the life of the mind, the life of the University, and the principles that guide the NMSU University Honors Program. Combining critical thinking and experiential exploration, students will develop a personalized plan for success, both in and out of the classroom, consistent with the values of the Conroy Honors College and the mission of the University.

Learning Outcomes

1. Demonstrate critical thought about the nature of knowledge, learning, and student development in the contemporary University.
2. Explain how key concepts and principles serve as the foundation for the Honors College mission and values.
3. Create a plan for their experiences at NMSU, in and out of the classroom, that will maximize their academic achievement and personal success beyond graduation.

HNRS 1135G. Introduction to Biological Anthropology**3 Credits (3)**

This course provides a basic introduction to the broad field of biological anthropology. The research interests of biological anthropologists include the history and development of modern evolutionary biology, molecular and population genetics, modern primates, the primate and human fossil record, and modern human biological diversity. This is an Honors version of ANTH 1135G. It is taught with ANTH 1135G with differentiated assignments.

Corequisite: HNRS 1135L.

Learning Outcomes

1. Summarize the basic principles of evolution and recognize how they apply to the human species.
2. Recognize the biological and behavioral continuity of humans with all life, and especially other modern primate species.
3. Identify ways in which the human species is biologically and behaviorally unique.
4. Summarize fossil evidence for human evolution.
5. Distinguish the major Paleolithic industries and outline the behavioral and cognitive changes indicated by the fossil and archeological evidence.
6. Critically evaluate popular accounts of human variation and human evolution.
7. Interpret modern human dilemmas (e.g., overpopulation, co-evolution of disease, and genetic engineering) from an evolutionary perspective.
8. Discuss in class and analyze in writing scholarly arguments concerning course concepts.

HNRS 1135L. Introduction to Biological Anthropology Lab**1 Credit (1P)**

This laboratory course expand on the topics covered in lecture course and uses scientific methods and principles to examine evidence for the process of evolution, the nature of heredity, human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity. Hands-on experience with fossil and skeletal material will be an important part of the learning process. This is an Honors version of ANTH 1135L.

Corequisite: HNRS 1135G.

Learning Outcomes

1. Demonstrate an understanding of the scientific method.
2. Employ principles of Mendelian genetics to determine genotype and phenotype probabilities, and calculate gene, genotype, and phenotype frequencies using the Hardy-Weinberg Equilibrium formula.
3. Demonstrate an understanding of cell structure and functions.
4. Use common lab and anthropometric equipment such as a compound microscope and calipers.
5. Discuss primate evolution, and compare and contrast members of the Primate order in terms of structure, behavior, and phylogeny.
6. Classify hominid species based upon selected traits such as anatomical changes associated with bipedalism, changes in the size and structure of the brain, and the development of culture.
7. Locate and describe the major bones of the human skeleton, and identify characteristics of human skeletons or skulls such as gender, age, and ancestry.
8. Discuss current research in genome analysis of various hominid populations.

HNRS 2110G. The Present in the Past: Contemporary Issues and their Historical Roots**3 Credits (3)**

This course will take today's concerns, trends, and customs and contextualize them in the past, explaining their historical origins and development. As an example, we will examine the history of celebrity and how celebrities -- from Lord Byron to the Kardashians' made an impact on their contemporaries and the broader society of their time. This reading- and writing-intensive course will help students develop skills related to critical thinking, logical argumentation, and written and oral communication.

Learning Outcomes

1. Analyze and critically interpret primary sources and understand how others might interpret and use the same material in different ways;
2. Recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives.
3. Understand how historical experiences and memories have shaped contemporary societies;
4. Identify and understand the degree to which history has been used and misused in the past;
5. Draw on historical and/or cultural perspectives to evaluate any or all of the following: contemporary problems/issues, contemporary modes of expression, and contemporary thought.
6. Demonstrate improvement in their ability to read critically, think logically, and express themselves clearly in writing.

HNRS 2111. Successful Fellowship Writing**1 Credit (1)**

Provides scholars with hands-on skills to complete proposals for scholarships and fellowships, such as the Truman, Rhodes, Marshall, Goldwater, Udall, and others. Other skills include how to write resumes, develop general research skills, and find grant and foundation sources. For freshmen and sophomores. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Review of Prestigious International and National scholarships
2. Best practices in preparing competitive proposals and applications
3. Effective strategies for writing compelling Executive summaries, Resumes, and Personal Statements

HNRS 2114G. Music in Time and Space**3 Credits (3)**

Introduction to all forms of Music. Through our auditory senses and intellectual faculties music is an ideal means for intelligent and humanistic examination of peoples and cultures, and for the enhancement of life. Types of music covered include classical, jazz, rock and roll, and world music. Music videos, live in-class performances, evening concerts, and lectures will be used as a basis for discussions and research. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Analyze and critically interpret significant primary texts and/or works of art (this includes fine art, literature, music, theatre, and film).
2. Compare art forms, modes of thought and expression, and processes across a range of historical periods and/or structures (such as political, geographic, social, cultural, religious, intellectual).
3. Recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives.
4. Draw on historical and/or cultural perspectives to evaluate all of the following: contemporary problems/issues, contemporary modes of expression, and contemporary thought

HNRS 2115G. Encounters with Art**3 Credits (3)**

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Articulate the relationship of art to the human experience
2. Apply the vocabulary of art to critical writings and discussions
3. Interpret art works within cultural, social, personal and historical contexts

HNRS 2116G. Earth, Time and Life**4 Credits (3+3P)**

Covers how the earth's materials form, processes involved in changing the earth's configuration, and extent of people's dependence upon the earth's resources. Includes mineral and energy resources, development of landscapes, environmental problems, evolution of the earth and life forms. May be taken in place of GEOL 1110. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Gain a general understanding of geology and the geological processes that have been occurring throughout Earth's history.
2. Learn about some of the common minerals and rocks that are the building blocks to geology and the rock cycle.
3. Investigate the processes associated with each rock type (e.g., volcanoes, faults, depositional processes, etc.) and as well as potential geologic hazards (e.g., volcanic eruptions, earthquakes, flooding, etc.).
4. Recognize and identify common minerals and rocks and understand the basic processes and conditions responsible for their formation and occurrence.
5. Comprehensively understand how the internal and external parts of the Earth have functioned throughout geologic time.

HNRS 2117G. The World of the Renaissance: Discovering the Modern**3 Credits (3)**

An introduction to the literature and thought of Renaissance Europe. Humanism and the Reformation will be approached through the intensive study of major writers such as Petrarch, Machiavelli, Luther, Erasmus, Montaigne, and Shakespeare. Restricted to Las Cruces campus only. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Analyze and critically interpret significant primary texts and/or works of fine art, literature, philosophy, and theatre from the early modern period;
2. Locate art forms, modes of thought and expression, and processes from the early modern period in historical and/or cultural context and compare them to those of other time periods;
3. Demonstrate an understanding of how early modern historical and/or cultural perspectives and key technological developments contributed to the development of contemporary thought and modes of expression;
4. Recognize and articulate the diversity of human experience across historical periods and/or cultural perspectives;
5. Demonstrate skill in working with relevant secondary resources and research tools to develop a class

HNRS 2120G. Foundations of Western Culture**3 Credits (3)**

Critical reading of seminal texts relating to the foundations of culture and values in Western civilization, from ancient Greece to about 1700. Focus on the development of concepts of nature, human nature, and the state. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Students will enhance abilities to quickly read, comprehend, and evaluate lengthy, complex texts to extract their fundamental arguments.
2. Students will improve critical thinking by grappling with ethical issues about the rights of individuals versus societies.
3. Students will use historical analysis to contextualize current social, political, geographic, and economic issues and how the foundations continue to affect contemporary society.

HNRS 2130G. Shakespeare on Film**3 Credits (3)**

How do Shakespeare's plays continue to speak to us through the medium of film? Written in a time of rapid social change, Shakespeare's plays invited audiences to think critically about the relationship between the self and others and to question conventions. Performances of Shakespeare have long been used to call out social injustice, from western anti-Semitism prior to World War II (The Merchant of Venice), to civil rights-era white supremacy in the US and apartheid in South African (Othello), and authoritarianism in the Arab Spring (Richard III). This course focuses on post-1980 Hollywood film versions of Shakespeare's plays and a few prior landmark adaptations around the world, examining how they use Shakespeare as a medium for debate and even a catalyst for social change.

Learning Outcomes

1. Demonstrate critical thinking by identifying issues and problems in the film adaptation of Shakespeare; 2. Engage in intercultural reasoning and develop intercultural competence and historical consciousness in analyzing film adaptations from the US, Europe, and Asia;
2. Engage with questions of personal and social responsibility as explored in Shakespeare's plays and modern film adaptations;
3. Conduct effective research on a relevant topic, evaluating the validity and authority of secondary sources, synthesizing ideas, and drawing reasonable conclusions; 5. Present independent research in collaboration with other student researchers and reflect on this teamwork experience

HNRS 2140G. Plato and the Discovery of Philosophy**3 Credits (3)**

Examines arguments and theories found in the Platonic dialogues with a view to determining the nature and value of philosophy both from Plato's point of view and absolutely. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Students will evaluate a number of Plato's dialogues to understand his doctrines and arguments.
2. Students will use their understanding to further evaluate why his philosophies have remained influential in modern, Western society and beyond.
3. Students will develop well-formulated, compelling arguments from philosophical texts.

HNRS 2141G. Bamboo and Silk: The Fabric of Chinese Literature**3 Credits (3)**

Introductory survey of traditional and modern Chinese prose and poetry in translation with emphasis on genre, theme, and social/historical context. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Students will acquire extensive knowledge of one of the world's oldest and richest literary traditions.
2. Not incidentally, students will also gain knowledge of China's history and philosophical traditions.
3. As this class is based on reading, writing, and discussion, students will hone their interpretive and expressive skills.

HNRS 2145G. Celtic Literature**3 Credits (3)**

This course provides an overview of the most important early literary works of the so-called Celtic nations, principally Ireland and Wales, from a literary and historical approach. This literature stems from the period 600-1200 and ends with the development of the Romances under influence from the French

Learning Outcomes

1. Students will learn the concept of the international folk tale,
2. Students will learn about the history of the Celts
3. Students will learn about the concept of Celtic nations' formed during the 19th Century.
4. Students will enhance critical thinking skills.
5. Students will enhance written and oral communication.

HNRS 2160G. New Testament as Literature**3 Credits (3)**

Literature of the New Testament examined from a literary perspective. Emphasis on translation history of the New Testament, generic features of gospel, epistle and apocalypse, precedent literary models, problems of authorship, classification of New Testament texts. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Students will hone critical thinking skills by analyzing arguments and controversies surrounding the roots of Christianity.
2. Students will discern and discuss the viability of both literary and historical sources with debated authorship, dating, and interdependency.
3. Students will practice interpersonal navigation and maintaining an academic environment of respect as they discuss a number of topics that can be considered controversial or subjective.

HNRS 2161G. Window of Humanity**3 Credits (3)**

Anthropology is the most humanistic of the sciences, and the most scientific of the humanities. This course will use anthropological perspectives to examine the human experience from our earliest origins, through the experiences of contemporary societies. We will gain insights into the influence of both culture and biology on shaping our shared human universals, and on the many ways in which human groups are diverse. Restricted to Las Cruces campus only. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Explain the concepts that define Anthropology (along with its subfields) as a specific research discipline.
2. Possess a growing vocabulary for anthropology, cultural study, ethnographic research and writing that will empower them as they continue with their degrees and professional careers.
3. Recognize how Anthropological concepts, terms, and methods are valuable for present-day concerns and how these tools can be used to engage life and the world at large.

HNRS 2165G. Introduction to Humanities in the 21st Century**3 Credits (3)**

An exploration of the global humanities according to its various manifestations: environmental, public, digital, and applied.

Learning Outcomes

1. Articulate what the humanities are and what role they have played in education throughout the ages
2. Critically analyze and communicate orally and in writing various humanities concepts and global interconnections among peoples and cultures.
3. Describe, through the study of the global humanities, how cultural contexts and human practices influence individuals and societies.
4. Apply the knowledge and skills gained through the study of the global humanities to explore their majors, their career goals, and the responsibilities of individuals in their communities.
5. Demonstrate information literacy and technological skills in researching and presenting themes related to the global humanities.
6. Reflect on the effects of the global humanities on individuals.

HNRS 2170G. The Human Mind**3 Credits (3)**

The primary course objective is to develop an appreciation of the variety and complexity of problems that are solved by the human mind. The course explores how problems are solved by a combined computational analysis (computational theory of mind), and evolutionary (evolution by natural selection) perspective. The mind is what the brain does (i.e. information processing) and the brain is a computational device that is a product of evolution by natural selection. Note that this is not a neuroscience course, we will be focusing on the mind (what the brain does) rather than on the brain. Restricted to Las Cruces campus only.

Learning Outcomes

1. Enhance written and oral communication
2. Stimulate critical thinking and learn to weigh scientific evidence
3. Challenge students to make ethical decisions and promote personal and social responsibility

HNRS 2171G. The Worlds of Arthur**3 Credits (3)**

Arthurian texts and traditions from medieval chronicles to contemporary literature. Emphasis on both the continuities of the Arthurian tradition and the diversity of genres, media, and cultures that have given expression to the legend. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Students will examine how texts and narratives, even with fictional implications, still held psychological, social, cultural, and religious sway within developed societies throughout history.
2. Students will synthesize information from an array of both primary and secondary sources to measure the cultural significance King Arthur holds in contemporary societies.
3. Students will extrapolate how a society's values at any point in history will affect the transference of mythos, just as a myth transmits the values of that society.

HNRS 2172G. Archaeology: Search for the Past**3 Credits (3)**

A critical evaluation of various approaches to understanding prehistory and history. The methods and theories of legitimate archaeology are contrasted with fantastic claims that invoke extraterrestrials, global catastrophes, transoceanic voyages, and extra-sensory perception. May be repeated up to 3 credits. Restricted to Las Cruces campus only. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Identify, describe, and explain how human lifeways changed in diverse communities in different parts of the globe.
2. Select and use relevant archaeological evidence to articulate how people's beliefs and values were influenced by politics, geography, economics, culture, biology, history, and social institutions in the past.
3. Analyze the significance of archaeological artifacts in context and explain their relevance to understanding relations among individuals, their society, and the environment.
4. Evaluate how practices in research, conservation, and tourism to archaeological sites promote ethical stewardship of non-renewable archaeological resources.
5. Design a study tour to archaeological sites that will address a key question or argument in prehistory and promote historic/archaeological preservation.

HNRS 2175G. Introduction to Communication Honors**3 Credits (3)**

Study and practice of interpersonal, small group, and presentational skills essential to effective social, business, and professional interaction. May be repeated up to 3 credits.

Prerequisite: An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Learning Outcomes

1. Analyze and evaluate oral and written communication in terms of situation, audience, purpose, aesthetics, and diverse points of view.
2. Express a primary purpose in a compelling statement and order supporting points logically and convincingly.
3. Use effective rhetorical strategies to persuade, inform and engage.
4. Employ writing and/or speaking processes such as planning, collaborating, organizing, composing, revising editing to create presentations using correct diction, syntax, grammar and mechanics.
5. Integrate research correctly and ethically from credible sources to support the primary purpose of a communication.
6. Engage in reasoned civil discourse while recognizing the distinctions among opinions, facts, and inferences.

HNRS 2176. Acting for Everyone**3 Credits (3)**

To provide fundamental training in acting techniques, including stage voice and movement, improvisation, ensemble building, characterization, emotion exploration and basic performance analysis. The course will provide a correlation between theatre skills and everyday "life" skills and seek to encourage an appreciation for the art of theatre.

Learning Outcomes

1. Improve effectiveness of oral communication.
2. Enhance creativity and appreciation of theatre.
3. Build confidence and expressiveness.

HNRS 2178G. Theatre: Beginnings to Broadway**3 Credits (3)**

Intercultural and historical overview of live theatre production and performance, including history, literature and professionals. Students attend and report on stage productions. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Distinguish and differentiate the characteristics of theatre from other art forms.
2. Describe the major components of a theatrical event.
3. Describe the functions of various theatre personnel.
4. Define specific terms relating to the study of theatre.
5. List and describe the parts of a play.
6. Define the different parts of plot.
7. Critique plays
8. Describe the characteristics of theatre in the different periods of history.
9. Develop an appreciation for theatre as an art form and a reflection of society

HNRS 2180G. Citizen and State Great Political Issues**3 Credits (3)**

The fundamental questions of politics: why and how political societies are organized, what values they express, and how well they satisfy those normative goals and the differing conceptions of citizenship, representation, and freedom. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Students will investigate the fluid state of American politics by discerning the decisions and policies of a selection of presidents.
2. Students will investigate the complex operations behind a representative democracy.
3. Students will examine how the sociopolitical environment surrounding a president influences his policies, and how a president's policies affect the broader society.
4. Students will assess and measure how politics can be affected by active and engaged citizens

HNRS 2185G. Democracies, Despots and Daily Life **3 Credits (3)**

This course will offer students the chance to read firsthand accounts of ordinary citizens' lives under different political systems, from the earliest age to the present day. This reading- and writing-intensive course will help students develop skills related to critical thinking, logical argumentation, and written and oral communication.

Learning Outcomes

1. Analyze and critically interpret primary sources and understand how others might interpret and use the same material in different ways;
2. Recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives.
3. Understand how historical experiences and memories have shaped contemporary societies;
4. Identify and understand the degree to which history has been used and misused in the past;
5. Draw on historical and/or cultural perspectives to evaluate any or all of the following: contemporary problems/issues, contemporary modes of expression, and contemporary thought.
6. Demonstrate improvement in their ability to read critically, think logically, and express themselves clearly in writing.

HNRS 2190G. Claiming a Multiracial Past **3 Credits (3)**

Survey of history of the United States in the nineteenth and twentieth centuries, with an emphasis on multicultural social and cultural history. Focus on understanding American history from the point of view of dispossessed, impoverished, and disenfranchised Americans who have fought to claim both their rights as Americans and American past. 5 or higher

Prerequisite(s): An ACT score of 26 or higher; or a combination of an ACT score of 24-25 with a High School GPA of 3.75; or a NMSU cumulative GPA of 3.

Learning Outcomes

1. Students will contextualize the current state of American "being" by focusing on the multicultural-social and cultural history of the U.S. in the nineteenth and twentieth centuries.
2. Students will hone public speaking and presentation skills through classroom discussions and activities.
3. Students will practice interpersonal navigation and maintaining an academic environment of respect as they discuss a number of topics that can be considered controversial or subjective.

HNRS 2996. Special Topics **1-3 Credits (1-3)**

Special course offerings, with unique titles listed in Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

HNRS 303V. Personal Financial Planning and Investing in a Global Economy Honors **3 Credits (3)**

Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements. May be repeated up to 3 credits.

Prerequisite: 3.5 GPA.

Learning Outcomes

1. Same as the existing learning goals for BFIN 303V with the addition of an Experiential Learning Experience. Students will apply what they learn in BFIN 303V to the development of a community financial wellness program at NMSU and/or in the community

HNRS 304V. Dilemmas of War and Peace **3 Credits (3)**

A multi-disciplinary introduction to war, peace, and world order studies. The origins of war and the foundations of peace are explored in the context of a rapidly changing world order.

HNRS 305V. Is Fake News Real: Journalism, Community, and Mass Communications **3 Credits (3)**

Overview of how technology, money, politics, and human desire have changed journalism since 1963. Explores role of journalism in news dissemination, influencing opinion, and political behavior. Course includes guest lectures from regional journalists and media experts.

HNRS 306V. Science, Ethics and Society **3 Credits (3)**

Investigation of the ethical issues related to scientific investigation and the ethical implications of scientific discoveries for society. Emphasis on discussion of case studies about specific ethical issues in science, and readings by both scientists and non-scientists.

HNRS 308V. Into the Final Frontier **3 Credits (3)**

Exploration of space; a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to compare and contrast previous history with current global events.
2. Students will be able to use perspectives from history to draw conclusions about the geopolitical, economic, ethnic, and cultural outcomes of current geopolitical policies and events (especially as they relate to expanding the space frontier), and to draw your their conclusions.
3. Students will understand how critical it is to the human condition that humanity is always breaching a PHYSICAL frontier.

HNRS 309. Honors Global Citizenship**3 Credits (3)**

University students live in an age of globalization with daily impacts on every aspect of their lives. Combining explorations of the dimensions of global citizenship with an international abroad experience, this seminar is designed to help students become more internationally informed, interculturally competent, and globally minded as they learn about the experiences of citizens in other parts of the world and reflect about their own place in the world in new ways. May be repeated up to 6 credits.

Learning Outcomes

1. Identify dimensions of globalization and how they impact citizens from the local to the global.
2. Describe and reflect appreciation for unique cultural-historical contexts and how these shape personal judgments and world views.
3. Explain how national identities have significance for global citizenship – including students' identities as Americans abroad.
4. Demonstrate intercultural competence through both travel and engagement with others while abroad.
5. Synthesize lessons from content and experiences to develop a personal statement about global citizenship as a concept and as a personal identity with plans for future action.

HNRS 310. Academic Service Learning Honors**3 Credits (3)**

Academic service learning is a high impact form of pedagogy that integrates community-based service or outreach with classroom instruction to enhance both student learning and promote values of constructive civic engagement. This project-based class is designed to help make linkages between the academic world and the community by providing students with a supervised experience implementing service activities to meet an identified community need. From explorations of root causes of problems and the development of objectives to the challenges of implementation and assessment, students will be encouraged to think more critically about social problems and the complexity of identifying lasting solutions.

Learning Outcomes

1. Describe the process required to assess real world community problems
2. Clarify short- and long-term goals and objectives for any project
3. Construct and implement a project that will be beneficial for a specified target audience
4. Assess the process of implementation
5. Reflect on their service to enhance their personal development as active citizens

HNRS 313. Research and Writing**3 Credits (3)**

Workshop format designed to prepare students for research and writing associated with production of an honors thesis or a major research assignment. Does not count for general education or honors certification credit.

HNRS 314. Successful Fellowship Writing**1 Credit (1)**

Provides scholars with hands-on skills to complete proposals for scholarships and fellowships, such as the Truman, Rhodes, Marshall, Goldwater, Udall, and others. Other skills include how to write resumes, develop general research skills, and find grant and foundation sources.

HNRS 317V. Cultural Lessons on Nazism**3 Credits (3)**

Examination of the values and cultural manifestations of fascism in the period 1918-45 with multidisciplinary emphasis on European forms of fascism, particularly German Nazism. Course features a survey of literary, dramatic, poetic, cinematic, and artistic treatments of human behavior leading up to fascism, living under fascist rule, and coming to grips with the consequences of war and genocide.

HNRS 318V. The World of Cinema**3 Credits (3)**

Appreciation of the art of motion pictures as world-wide medium specific to national cultures. Refinement of cinematic literacy and critical viewing skills. Historical and thematic overview emphasizes collaborative nature of medium in various genres from 1895 to present. Selected films from different periods and different countries. Substantial library research projects.

HNRS 321V. Agriculture in an Interconnected World**3 Credits (3)**

Study of the impact of agriculture on cultural and social systems, with special emphasis on twentieth century urban development.

HNRS 324V. Science and the Arts: Theatre and Story**3 Credits (3)**

This course examines present day relations between the sciences and the representation and communication of science, especially in connection with theatre, narrative fiction, and autobiography. Crosslisted with: THEA 329.

HNRS 326V. Art and Mythology**3 Credits (3)**

Mythological figures, past and present, in the visual arts. Through iconographical studies (attributes and symbols), trace the development of visual traditions that evolved from the literary sources of classical Mediterranean mythology.

HNRS 328V. Rock History: 20th Century Popular Music**3 Credits (3)**

Evolution of popular music in the 20th Century. Examines the history of popular music conventions, influences, and breakthroughs through the 20th Century. Topics include the originations of major music styles and their evolution as cultivated by key artists, scientific advancements, and sociopolitical change, contextualized within the contemporaneous history. Of particular concern are the influences of groundbreaking artists; the effect of evolving playback electronics, recording devices, and musical instruments; and the interplay between music and economic depression, war, civil rights, sexual revolution, and other sociopolitical events.

HNRS 335V. Legal Issues in Modern Society**3 Credits (3)**

Case study approach to contemporary legal problems involving environment, consumer protection, international law, corporate responsibility.

HNRS 336V. Testimonios from the Borderlands**3 Credits (3)**

This course is about the testimonies (testimonios) and autobiographical writings about and by Latinas in the United States. Life stories are told through many forms: "testimonios," memoirs, autobiographies and autobiographical fiction, oral histories and short stories, poetry and poetic prose pieces, essays, and audio-stories. The course focuses on testimonios as method, epistemology, and pedagogy. Among the questions we will examine will be those concerning knowledge production, sexual politics, the mind-body-spirit connection, voice, representation, and truth. May be repeated up to 3 credits.

HNRS 341V. The Old Testament as Literature**3 Credits (3)**

Old Testament surveys a portion of the thirty-nine canonical books of the Old Testament from a literary approach, centered on the so-called historical-critical method that developed in the 19th C under such figures as Julius Wellhausen. Higher criticism of the texts, their sources, authorship, dating and interdependency has led to deepened insights as well as scholarly conflict. In addition, we will examine several apocryphal books that have continuing importance in our understanding of Old Testament. We will read the Old Testament along with an introduction and some supplementary materials.

HNRS 347V. World Dance**3 Credits (3)**

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as DANC 3510V with differential assignments for Honors students. May be repeated up to 3 credits.

HNRS 348V. Comparative Mythology: Myth, Ritual, and the Life Cycle**3 Credits (3)**

Exploration of the central myths of several religious traditions and investigation of how each, through ritual, has given meaning to key moments in the journey of the individual through life.

HNRS 349V. Islam and the West: Cultural Contacts, Conflicts, and Exchanges**3 Credits (3)**

This course examines interactions, encounters and cross-fertilization between the Islamic world and the West from the 7th -21st century. It begins with the origins of Islam and its relationship to Judaism and Christianity and ends in the post 9/11 present, an era some characterize as dominated by a "clash of civilizations."

HNRS 353V. Justice without Prejudice**3 Credits (3)**

Exploration of central questions about race, ethnicity, and justice. Students will learn to argue persuasively from different perspectives, both orally and in writing.

HNRS 362V. Native American Philosophy and Spirituality**3 Credits (3)**

Survey of philosophical traditions of Indigenous peoples of the Western Hemisphere. This course examines various forms of spiritual expression which encompasses art, dance, music, political/social activism, and the relationship to land. This course looks at present-day spiritual issues and on-going practices in Native America.

HNRS 370V. Design: The Creative Act**3 Credits (3)**

Explores the nature of design and what it means to design in various diverse media. Included are creative efforts in writing, art, music, and technology. Commonalities and differences are considered.

HNRS 371V. Paris: Beyond the Eiffel Tower**3 Credits (3+3P)**

This interdisciplinary course focuses on the evolution of the city of Paris from its earliest beginnings in the fifth century to modern times. Through the use of historical, political, sociological and artistic texts and films, we will explore the various narratives which emerge from the built environment of Paris as well as its mythic status as the "City of Light and Romance" and "Capital of Revolution., Modernity and Art."

HNRS 374V. The European City: History and Culture**3 Credits (3)**

Historical overview of development, growth, and culture of European cities.

HNRS 378V. Technology and Policy**3 Credits (3)**

Study of the processes through which society sets goals for science and technology, of the allocation of resources needed to achieve these goals, and of the obligations and conflicts that develop as the goals are realized. International comparisons of public policies.

HNRS 381V. Economic Development of Latin America**3 Credits (3)**

Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries' problems.

Prerequisite(s): 3.2 cumulative GPA.

HNRS 387V. Comparative Perspectives on Women**3 Credits (3)**

The history, antecedents, and consequences of sex and gender systems around the world from the perspective of sociology, anthropology, and psychology. May be repeated up to 3 credits.

HNRS 388V. Leadership and Society**3 Credits (3)**

Exploration of the multifaceted nature of leadership in modern society through readings and seminar discussion. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain understanding of ethical principals of leadership.
2. Students will be able to apply ethical principals of leadership.
3. Students will be able to identify differing ways of enacting leadership across different cultures.

HNRS 390V. Worlds of Buddhism**3 Credits (3)**

This course is an introduction to Buddhism and its contribution to the formation of (East) Asian cultures. It provides students with Buddhist and (East) Asian "case studies" - i.e., examples of the ways in which Buddhism has influenced, and has been influenced by, the region's various cultural and social milieus over time. The course is designed to offer opportunities to critically reflect on Buddhism as a transformative philosophical, cultural and individual system. May be repeated up to 3 credits.

HNRS 394V. Southwestern and Border Literature**3 Credits (3)**

Introduction to the culturally diverse literature of the American Southwest and borderlands region. Class analyzes evolution of the Southwest concept and considers degree to which the existence of a borderlands culture is manifest in literature.

Prerequisite: honors eligibility.

HNRS 400. Honors Capstone**3 Credits (3)**

Independent-study research and writing project to be carried out under the supervision of a faculty member. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will apply concepts from their discipline in the development and implementation of a capstone research or creative activity project.

HNRS 410. Honors Internship**3-6 Credits**

Assignments in departments to be supervised by faculty in the area. A cumulative 3.5 GPA is required. May be repeated up to 12 credits. Consent of Instructor required.

HNRS 411V. Great Theorems in Mathematics**3 Credits (3)**

Same as MATH 411V.

Prerequisite: Grade of C- or higher in MATH 1531, or grade of B or higher in any upper-division math course, or consent of instructor.

Learning Outcomes

1. At the end of this course, students will be able to: Describe the history of the development of some key mathematical concepts.
2. Describe the connections between mathematical ideas in different historical periods and places.
3. Recognize the role of abstraction and logic in the progress of mathematics.
4. Describe the contribution of mathematics to culture and science in different historical eras.
5. Determine if a mathematical conjecture is correct and provide rigorous written mathematical justification.
6. Provide sound, complete and clear mathematical arguments involving simple calculations, geometric constructions, and/or written mathematical proofs.
7. Communicate mathematical ideas, both written and orally.

HNRS 412. Medical College Admission Test Preparation**3 Credits (3)**

This course prepares students to optimize their performance on the Medical College Admission Test that is required for admission to medical schools throughout North America. This course should be taken only after completing requisite courses in biology, chemistry and biochemistry, physics, health sciences, and appropriate social science electives.

Prerequisite(s): Completion of basic courses in STEM, health sciences and behavioral sciences.

HNRS 413. Medical Shadowing**1-3 Credits (1-3)**

For students who are shadowing medical professionals this course will provide academic credit for completion of this experience. May be repeated up to 6 credits.

Prerequisite(s): Completion of 57 credits, of any subject.

HNRS 415. Honors, Non-Capstone: Directed Field Work**1-6 Credits (1-6)**

In this class students will be working to gain professional experiences by extensively immersing yourself in a professional setting. Students will be required to 1) complete all pre and post paperwork and requirements, 2) complete their placement hours, and 3) complete a weekly reflection prompt. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrating understanding of professional customs and practices.
2. Organizing and maintaining information.
3. Applying knowledge to the task.
4. Serving clients and stakeholders.
5. Negotiating and arriving at a decision.
6. Working with diversity/diverse populations.
7. Identifying, understanding, and working with professional standards.
8. Improving problem-solving and critical thinking skills.
9. Monitoring and correcting performance. 1
10. Exercising leadership. 1
11. Behaving professionally and ethically. 1
12. Listening effectively. 1
13. Dressing appropriately. 1
14. Addressing colleagues and superiors appropriately. 1
15. Allocating time effectively. 1
16. Adapting effectively to changing conditions. 1
17. Participating as a member of a team. 1
18. Developing appropriate workplace attitudes. 1
19. Understanding and managing personal behavior and attitudes. 2
20. Developing individual responsibility.

HNRS 420. Independent Studies**1-3 Credits**

Directed, individual studies and projects.

Prerequisites: consent of instructor and honors eligibility.

HNRS 421. Special Topics**1-3 Credits (1-3)**

Special course offerings, with specific titles listed in Schedule of Classes. May be taken for unlimited credits. May be repeated up to 99 credits.

Learning Outcomes

1. Each course will have unique learning goals.

HNRS 422. Directed Research**3 Credits (3)**

Individual research projects supervised by faculty advisers. Consent of instructor required.

HNRS 450V. The Sundt Honors Seminar**3 Credits (3)**

The Sundt Honors Seminar is a unique, experience-based, interdisciplinary seminar developed and taught by the holder of the Sundt Honors Professorship for the year. The subject of the course will vary according to the discipline of the Sundt Professor. The course may include a travel experience related to the seminar topic, hosting of outside specialists, or other unique activity. Open to students by application. Students selected for the course are named Sundt Scholars.

Prerequisite(s): ENGL 1110G or equivalent.

HNRS 521. Special Topics**3 Credits (3)**

Graduate level to be cross-listed with HNRS 421 Special Topics at the undergraduate level.

HORT-HORTICULTURE

HORT 1115G. Introductory Plant Science**4 Credits (3+2P)**

Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 1110G.

Learning Outcomes

1. Describe the role plants play in everyday lives
2. Introduce career opportunities in plant and soil sciences, and related fields
3. Define plants through the concepts of plant structure and anatomy
4. Introduce the wide variety of plants cultivated throughout the world
5. Describe how plants work (growth, reproduction, physiology, and soil)
6. Describe how plants are manipulated to feed, clothe and entertain the world

HORT 2110. Ornamental Plants I**4 Credits (2+3P)**

Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.

Learning Outcomes

1. Given 35 ornamental plants selected from the course's plant list, 100% of students will be expected to correctly identify the genus, species, and common names of the plants with 70% accuracy.
2. Given plants selected from the course's plant list, 100% students will be expected to identify to landscape use of those plants with 85% accuracy.

HORT 2120. Ornamental Plants II**4 Credits (2+3P)**

Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.

Learning Outcomes

1. Given 35 ornamental plants selected from the course's plant list, 100% of students will be expected to correctly identify the genus, species, and common names of the plants with 70% accuracy.
2. Given plants selected from the course's plant list, 100% students will be expected to identify to landscape use of those plants with 85% accuracy.

HORT 2130. Floral Quality Evaluation and Design**2 Credits (1+2P)**

Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.

Learning Outcomes

1. Identify common floriculture crops, or know resourcing to help identify the crop.
2. Evaluate quality (merit and fault) of common floriculture crops, based on industry standards and merit. Pi Alpha Xi and American Floral Endowment standards will be used for the purpose of this class.
3. Have a basic understanding of the floriculture industry, and identify career pathways within the industry.
4. Know, understand, creatively interpret, and execute basic principles of design in regards to floral design.
5. Use interpersonal communication, problem solving, basic math, and marketing during cash and carry "lab" time (flower sales) in developing job ready skills in floristry.
6. Layer principles of design, marketing, sales, and time management to create floral art in real-world scenarios.

HORT 2160. Plant Propagation**3 Credits (2+2P)**

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 2160.

Learning Outcomes

1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, "hands-on" laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

HORT 2990. Floriculture Field Practicum**1 Credit (1)**

Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.

Prerequisite(s): HORT 2130 or consent of instructor.

Learning Outcomes

1. Varies

HORT 2996. Special Topics**1-4 Credits**

Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

HORT 300. Special Topics**1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

HORT 302V. Forestry and Society**3 Credits (3)**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.

HORT 304. Hydroponics**4 Credits (4)**

This course will introduce students to the basics of the different soil-less growing systems: hydroponics, aeroponics and aquaponics. Topics will include growing systems and environments, crop management, business aspects of hydroponic growing, integrated pest management, commercial and restaurant systems, and plant nutrition. Labs will reinforce lecture topics and give students practical experience growing different types of crops in different types of systems.

Learning Outcomes

1. Discuss the benefits and constraints of different hydroponic systems; evaluate different crops for each type of system;
2. Identify the components and calculate costs of different systems; demonstrate how to build and maintain each type of system;
3. Discuss how soilless growing relates to sustainability and local food production

HORT 305. Principles of Genetics**3 Credits (3)**

Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.

Prerequisite: (BIOL 2610G, BIOL 2110G and either CHEM 1215G or CHEM 1216).

Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

HORT 307. Landscape Design**3 Credits (2+3P)**

Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques. Prerequisites : HORT 2110 or HORT 2120 or concurrent enrollment or consent of instructor.

HORT 310. Medicinal Herbs**3 Credits (3)**

Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.

HORT 315. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 315

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

HORT 318V. Urban Water Issues and Society**3 Credits (3)**

Global study of water science, development, law, and use for agriculture, manufacturing, landscaping, home use, and other urban uses. This course allows students to become familiar with important issues concerning the interaction between water use and humans. Topics include the water cycle, water chemistry, human-water relations, plant-water relations, water users, water-dependent population placement and growth, water regulation, and the future of water.

Learning Outcomes

1. Define and describe Earth's water sources and the water cycle.
2. Describe the chemical processes associated with water and analyze the composition of several water sources.
3. Summarize the interactions of water with the human body.
4. Explain the use of water in agricultural and other plants on both a regional scale and cellular level.
5. Identify, explain, and compare all water users and categorize their demand and availability for water.
6. Analyze the interconnection of the human societies and water while discussing locations of civilizations and communities.
7. Analyze, from a historical perspective, the interrelationships of all water users and all water decision makers. Describe the history of US and world water regulation and analyze its success rate.
8. Predict and recommend how water will be used and distributed in the future.

HORT 365. Principles of Crop Production**4 Credits (3+3P)**

Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production.

Crosslisted with: AGRO 365

Prerequisite(s): AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.

HORT 377. Introduction to Turfgrass Management**4 Credits (3+3P)**

Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease insects and turfgrass varieties. Crosslisted with: AGRO 377

HORT 378. Turfgrass Science**4 Credits (3+3P)**

Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology.

Prerequisite(s): HORT 377 or consent of instructor.

HORT 391. Internship**1-6 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

HORT 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, ENVS 447 and SOIL 447.

HORT 449. Special Problems**1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

HORT 450. Special Topics**1-4 Credits**

Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

HORT 462. Plant Breeding**3 Credits (3)**

Principles and practices involved with the genetic improvement of plants. May be repeated up to 3 credits.

Prerequisite(s): ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 315 and GENE 320.

HORT 471. Plant Mineral Nutrition**3 Credits (3)**

Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471. May be repeated up to 3 credits.

Prerequisite/Corequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

HORT 479. Advanced Turfgrass Science**3 Credits (3)**

Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.

Prerequisite: HORT 378 or consent of instructor.

HORT 485. Vegetable Crop Management**4 Credits (3+2P)**

Physiological, environmental and cultural aspects of vegetable crop production. Corequisite(s): AGRO 365/HORT 365

HORT 488. Greenhouse Management**4 Credits (3+3P)**

Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.

Prerequisite(s): HORT/AGRO 365 or consent of instructor.

HORT 492. Diagnosing Plant Disorders**3 Credits (2+3P)**

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.

Prerequisites: EPWS 303 and EPWS 310.

HORT 500. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

HORT 505. Research Orientation**4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, SOIL 505 and ENVS 505.

HORT 515. Crop Physiology**3 Credits (3)**

Whole plant physiological processes as related to growth, development, yield, quality and post harvest physiology of crop plants within the environment of the crop community. Crosslisted with: AGRO 515

Prerequisite(s): EPWS/BIOL 314 or consent of instructor.

HORT 525. Scientific Writing How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

HORT 590. Graduate Seminar**1 Credit (1)**

Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

HORT 595. Internship**1-6 Credits**

Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

HORT 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.

Prerequisite(s): Master level graduate students.

HORT 597. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and SOIL 597

HORT 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

Prerequisite: consent of instructor.

HORT 599. Master's Thesis**15 Credits**

Thesis.

HOST-HOSPITALITY AND TOURISM

HOST 155. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

HOST 201. Introduction to Hospitality Industry**3 Credits (3)**

Overview of hospitality industry; organization and operation of lodging, food and beverage, and travel and tourism segments; focus on career opportunities and future trends of hospitality industry. Restricted to: Community College campuses only.

HOST 202. Front Office Operations**3 Credits (3)**

Hotel/motel front office procedures detailing flow of business, beginning with reservations and extending to the night audit process. Restricted to: Community College campuses only.

HOST 203. Hospitality Operations Cost Control**3 Credits (3)**

Management of Food & Beverage facilities using cost control techniques. Functional training in menu analysis and development with all phases of product flow through a Food & Beverage organization explored. Restricted to: Community Colleges only.

HOST 204. Promotion of Hospitality Services**3 Credits (3)**

Organization of hotel marketing functions; developing a marketing plan to sell the varied services of the hotel/motel property. Restricted to: Community College campuses only.

HOST 205. Housekeeping, Maintenance, and Security**3 Credits (3)**

Function of housekeeping departments, including personnel, sanitation, maintenance, and materials. A survey of security procedures to include guest protection and internal security of hotel/motel assets. Restricted to: Community College campuses only.

HOST 206. Travel and Tourism Operations**3 Credits (3)**

Transportation, wholesale and retail operations, attractions, the traveler, tourism development, and operational characteristics of tourism business. Restricted to: Community College campuses only.

HOST 208. Hospitality Supervision**3 Credits (3)**

Strategies for directing, leading, managing change and resolving conflict. Prepares students to meet expectations of management, guests, employees, and governmental agencies. Restricted to: Community College campuses only.

HOST 210. Catering and Banquet Operations**3 Credits (3)**

Teaches the basics of catering and banquet operations, including computer coordination, planning, set up, service, and completion. Restricted to Community Colleges campuses only.

HOST 214. Purchasing and Kitchen Management**3 Credits (3)**

Technical purchasing concepts, product selection, and specifications. Safety and sanitation as they relate to food service establishments. Prepares student for work with HACCP programs. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): HOST 203.

HOST 216. Event, Conference and Convention Operations**3 Credits (3)**

The ability to successfully plan, organize, arrange, and execute special events is critical to the success of many hospitality organizations. This course gives the student a grounding in the skills necessary to achieve success in this area. A variety of events are discussed and the similarities and differences with conferences and conventions are explored. Students are taught to organize and plan events of varying type and durations. Sales, logistics, and organizing skills are emphasized. Restricted to: Community College campuses only.

HOST 219. Safety, Security and Sanitation in Hospitality Operations**3 Credits (3)**

It is the responsibility of the manager to provide appropriate security, sanitation, and safety precautions in hospitality operations. Preparation for internal and external disasters is an important task for the Hospitality Manager. This course uses the National Restaurant Association ServSafe® training material. Restricted to: Community College campuses only.

HOST 221. Internship I**1-3 Credits (1-3)**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEHS, HOST majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

HOST 222. Cooperative Experience II**3 Credits (3)**

Continuation of HOST 221. Restricted to majors. Graded: S/U. Restricted to: Community College campuses only. Restricted to HOST majors.

Prerequisite(s): HOST 221.

HOST 239. Introduction to Hotel Management**3 Credits (3)**

This course covers basic management functions in hotels, resorts, Boutique Hotels, Bed & Breakfast establishments, and other lodging operations. All aspects of the operation are covered including guest management, operations, and sales and marketing. Restricted to: Branch campuses only.

HOST 255. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits. Restricted to Community Colleges campuses only.

HOST 298. Independent Study**1-3 Credits (1-3)**

Individual studies directed by consenting faculty with prior approval of department chair. May be repeated for a maximum of 3 credits. Restricted to: Community College campuses only.

Prerequisite(s): Minimum 3.0 GPA and sophomore standing.

HRTM-HOTEL/RESTRNT/TOURISM MGT

HRTM 1120G. Introduction to Tourism

3 Credits (3)

Survey of travel and tourism development and operating characteristics.

Learning Outcomes

1. Define tourism and related terms.
2. Identify and explain the role of the elements of the destination mix.
3. Identify the potential socio-cultural, economic and environmental impacts of tourism.
4. Identify and describe the role of key governmental and nongovernmental organizations in tourism.
5. Describe basic tourism planning and development principles.
6. Discuss the unique challenges of tourism marketing and standard marketing methods.
7. Describe the components of the tourism distribution system.
8. Demonstrate a basic understanding of traveler behavior including motivations and barriers to travel.
9. Identify major factors that influence traveler flows. 1
10. Describe the role of major modes of transportation in the tourism system. 1
11. Identify and describe the three pillars of sustainable tourism development. 1
12. Explain personal and social responsibility as it relates to sustainable tourism development. 1
13. Demonstrate effective communication and critical thinking skills.

HRTM 1130. Introduction to Hospitality Management

3 Credits (3)

Overview of the major segments of the hospitality industry, with a focus on basic management principles.

Learning Outcomes

1. Understand the concept of management contracts and franchising.
2. Recognize and understand needed leadership qualities to achieve organizational objectives.
3. Understand the hospitality industry within the global environment.
4. Identify company and industry trends.
5. Understand the functions of all departments in a hospitality organization (restaurant, hotel, club, etc.).
6. Apply the concepts of convention management, meeting and event planning, and casino management.
7. Understand the concepts of quick and institutional/contract foodservice management.
8. Understand the principles of bar management and compare and contrast wines, beers and distilled spirits.
9. Manage the process of service delivery. 1
10. Identify and solve managerial problems 1
11. Manage a diverse workforce and develop positive employee relations to reduce turnover.

HRTM 2110. Safety, Sanitation and Health in the Hospitality Industry

1 Credit (1)

Addresses public health, HACCP, and food safety responsibilities in the hospitality industry. Sanitation certification test allows students to receive national ServSafe Food Protection Manager Certification. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify the hazards to safe food and the foods at risk in a foodservice operation.
2. Identify and discuss the Hazard Analysis Critical Control Point (HACCP) system and be able to design a HACCP flowchart.
3. Demonstrate knowledge of how to protect food during purchasing, receiving, storing, preparing, holding, and serving.
4. Discuss the procedures for ensuring sanitary equipment, facilities, and food-handling practices.
5. Explain how to set-up cleaning, safety, pest control, crisis management, and training programs.

HRTM 2120. Food Production and Service Fundamentals**3 Credits (1+4P)**

Basic overview of food service systems including menu management, purchasing and production. The course includes basic principles of food fabrication and production. Topics include knife skills, culinary terminology, product identification, quality standards, nutritional cooking theory and application of food preparation techniques. The course includes laboratory aspects and demonstration of basic food production techniques, service styles, practices and procedures in food service operations including culinary math. This course provides students with an understanding of food service sanitation and culinary nutrition. Completion of a national certification examination is required. Students who have not completed HRTM 2110 before enrolling in the course must have proof of valid ServSafe Food Protection Manager certificate. Restricted to Las Cruces campus only. Prerequisite(s)/Corequisite(s): HRTM 2110

Prerequisite(s): HRTM 1130 or FSTE 2110G.

Learning Outcomes

1. Demonstrate use of standard recipes and how to reduce and increase their yields
2. Demonstrate basic culinary knife cuts, basic fabrication and mise en place
3. Demonstrate basic cookery techniques of dry, moist and a combination of heat
4. Demonstrate the proper plating and garnishing of foods
5. Describe proper personal behaviors required for the safe handling of food
6. Identify and properly operate kitchen equipment.
7. Pass the ServSafe Exam
8. Describe the three forms of food contaminants and preventative measures.
9. Demonstrate how to properly "set" a table for service 1
10. Demonstrate how to provide dining room service with proper etiquette 1
11. Demonstrate safe work habits, identify safety hazards, and employ preventative safety measures. 1
12. Maintain positive relations with fellow students and faculty through teamwork. 1
13. Exhibit appropriate work habits and attitudes; demonstrate a willingness to compromise. 1
14. Demonstrate a positive attitude, conversation skills, personal hygiene and work attire.

HRTM 2130. Hotel Operations I**3 Credits (3)**

Analysis of hotel operations to include: guest services, reservations, reception, guest/city ledger and the night audit. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): HRTM 1130.

Learning Outcomes

1. Outline the history, magnitude and culture of the hotel industry
2. Define and identify hotel ownership and operational structures
3. Outline the organization and structure of a hotel and resort.
4. Describe and calculate the components and processes of room reservation forecasting, pricing and revenue management.
5. Outline and explain the flow of the guest from pre-arrival through arrival, room occupancy and departure.
6. Demonstrate the procedures and processes for Guest Accounting, the City Ledger, Guest Credit and the Night Audit.
7. Discuss problem solving and guest service associated with the front office and other departments of the hotel and resort.
8. Forecast impacts of technology to the guest services and hotel operations
9. Describe the day to day activities and responsibilities of a Hotel Front Office Manager or a Hotel Assistant General Manager (AGM).

HRTM 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be assigned on a semester basis for both lecture and laboratory assignments. May be repeated for a maximum of 4 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

HRTM 301. Hotel, Restaurant, and Tourism Marketing**3 Credits (3)**

The development of effective marketing programs for hospitality service organizations. Prerequisites: HRTM 1130

HRTM 302. Hospitality Management Accounting**3 Credits (3)**

Specialized accounting for hotel revenue and expenses; accounting for inventory, property, and equipment; hospitality payroll accounting; hotel departmental financial statements; income statement, balance sheet, and statement of cash flows; the analysis of financial statements; interim and annual reports; budgeting expenses; forecasting sales; budgetary reporting and analysis; and financial decision making.

Prerequisite: ACCT 2110.

HRTM 304. Hospitality and Travel Law**3 Credits (3)**

Specialized applications of the law to the hospitality and tourism industry. Prerequisite: Prerequisites: HRTM 1130

HRTM 307. Professional Development**1 Credit (1)**

Covers essential elements of career management including preparation for a successful internship. Restricted to majors. Graded S/U.

HRTM 311. Hospitality Leadership Management**3 Credits (3)**

Examines modern leadership theory in the context of the hospitality industry. Connects contemporary leadership topics to their historical antecedents through focused reading, discussion and film.

Prerequisites: HRTM 1130 and HRTM 1120.

HRTM 363. Quantity Food Production and Service
4 Credits (1+6P)

Covers quantity food production and service including cooking concepts, sanitation and safety, teamwork, dining room service, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe Food Protection Manager or NM Food Handler certification required. May be repeated up to 4 credits.

Prerequisite(s): HRTM 2120.

HRTM 408. Hospitality Internship
1 Credit (1)

Hospitality and tourism professional work experience for HRTM majors only. Restricted to majors.

Prerequisites: HRTM 307 and consent of instructor.

HRTM 409. HRTM Internship Seminar
1 Credit (1)

A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they encountered during HRTM 408 (Internship) and analyze them. Restricted to majors.

Prerequisites: HRTM 408.

HRTM 410. Hospitality Cost Control
3 Credits (3)

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers.) Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. May be repeated up to 3 credits.

Prerequisite(s): HRTM 302, HRTM 363.

HRTM 412. Beverage Management
3 Credits (3)

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. May be repeated up to 3 credits.

Prerequisite(s): HRTM 363.

HRTM 413. Restaurant Operations Management
4 Credits (1+6P)

Provides a detailed understanding of the processes of restaurant operations management. Students are expected to increase kitchen and service technical skills, develop and cook from recipes, develop a personal leadership style, understand food and wine pairing, and supervise front and back of the house operations. Provides the opportunity to perform a detailed analysis of a food and beverage operation. Proof of valid ServSafe Food Protection Manager or NM Food Handler certification and current NM Alcohol Server certification required. May be repeated up to 4 credits.

Prerequisite(s): HRTM 363.

HRTM 414. Wine Appreciation
3 Credits (3)

An experiential examination of wine through lectures, guest speakers and focused tasting of wine and food. Topics include viticulture, wine making varietals, terroir, wine service, tasting and evaluation techniques, and food pairings. Student must be at least 21 years old. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of instructor.

HRTM 416. Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
3 Credits (3)

Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment.

Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 420. Club Management and Marketing
3 Credits (3)

Provides an understanding of the general operational and administrative procedures practiced in private clubs from a marketing perspective with a special emphasis on managing and marketing club food and beverage operations and service. It will provide the professional golf management and hospitality students with the unique sensitivities required in managing and operating in the increasingly lucrative club management market.

HRTM 430. Hospitality Facilities Management
3 Credits (3)

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant. May be repeated up to 3 credits.

Prerequisite(s): HRTM 2130, HRTM 408.

HRTM 431. Hotel Operations II
3 Credits (3)

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. May be repeated up to 3 credits.

Prerequisite(s): HRTM 2130.

HRTM 432. Hotel Revenue and Sales Management**3 Credits (3)**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. May be repeated up to 3 credits.

Prerequisite(s): HRTM 2130.

HRTM 434. Senior Capstone Experience**3 Credits (3)**

Synthesizes all previous work. Students apply multi-disciplinary principles to the analysis of hospitality business cases and tourism problems.

Prerequisite: HRTM 408.

HRTM 435. Resort Management**3 Credits (3)**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities.

Prerequisite(s): HRTM 2130 or consent of instructor.

HRTM 436V. Sustainability in the Hospitality Industry**3 Credits (3)**

This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry.

Learning Outcomes

1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 443. Meetings, Conventions and Special Events**3 Credits (3)**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of Instructor.

HRTM 444. Entertainment Business and Venue Management**3 Credits (3)**

This course will review and examine the principles and practices associated with managing a public assembly venue and the nature of the venue and entertainment business. This is a comprehensive course designed to cover all aspects of incorporated event practices such as marketing, production, contracts, ticketing, and security.

Learning Outcomes

1. Analyze the origin and history of public assembly venues and the role they play within the community.
2. Analyze different ownership and management structures and how governance relationships impact operational management.
3. Analyze the business and financial operations of a public assembly venue.
4. Describe the booking process, the entities involved, and the importance of relationships.
5. Analyze and create marketing and sales strategies for both a public assembly venue and an event that is booked in the venue.
6. Identify and analyze the ticket system options available to venue managers, as well as their importance in access management, financial accountability, and data collection.
7. Analyze the role and importance of ancillary revenue sources, as well as the need for creativity and entrepreneurship.
8. Describe the operational systems and processes required to maintain a venue and produce events.
9. Analyze the event planning process and how it is used to produce an event experience for guests and clients.
10. Analyze management's role in developing and maintaining a safe and secure public assembly venue.

HRTM 445. An Overview of Italian Tourism focused on Food, Wine, Art and Culture**3 Credits (3)**

The course content provides a global perspective and understanding of Italian food, wine, art and culture and their integration into tourism. The content is designed to provide students an appreciation of Italian cultural values and an overview of food, wine and art in the tourism regions of Italy.

Learning Outcomes

1. Describe and explain the basic history of the tourism regions of Italy.
2. Recognize and describe the Italian food and wine industry and its impact on tourism.
3. Detail how the Italian's integrate sustainability into tourism.
4. Recognize the impact of culture and art on tourism.
5. Explain strategies for responsible travel abroad in Italy and the European Union focused on personal and group safety.
6. Analyze and evaluate multicultural differences between Italian and American societies focused on effective personal communication practices.
7. Produce a 20 slide narrated online presentation with pictures that focused on at least two course learning objectives

HRTM 450. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Prerequisite: consent of instructor.

HRTM 492. Special Problems**1-4 Credits**

Individual research in a selected subject area of hospitality management. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

Prerequisite: consent of instructor.

HRTM 501. The Hospitality Industry and Sustainable Competitive Strategy**3 Credits (3)**

An examination of the hospitality industry, and its contemporary strategic management principles and practices. Key components, industry organization, and competitive environment of the hospitality industry are analyzed. Strategic decision making principles are examined to create sustainable competitive advantages for hospitality and service industry leaders and organizations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Analyze key components, industry organization, and competitive environment of the hospitality industry.
2. Examine strategic decision making principles to create sustainable competitive advantages for hospitality and service industry leaders and organizations

HRTM 502. Advanced Hospitality Services Management**3 Credits (3)**

This course explores and applies the design and management of service quality in global hospitality organizations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Investigate the design and management of service quality in global hospitality organizations to create authentic and memorable hospitality experiences.
2. Design and manage service delivery systems to create a culture of service excellence
3. Define and discuss the relationship between service and financial performance in hospitality organizations

HRTM 503. Hospitality Organizational Leadership and Human Resources**3 Credits (3)**

Application of key organizational, leadership and human resource theories to global hospitality organizations. Analysis of key hospitality industry leaders, companies and systems. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Apply organizational, leadership and human resource theories to global hospitality organizations.
2. Analyze key hospitality industry leaders, companies and systems.
3. Coordinate teams to provide effective management and maintain successful employee and guest relations.

HRTM 504. Marketing Strategy for Global Hospitality**3 Credits (3)**

Application, analysis and evaluation of marketing theories, strategies and tactics for developing sustainable competitive advantage in the global hospitality industry. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Explore and analyze global hospitality markets, including the values and expectations of global hospitality consumers
2. Analyze and evaluate marketing theories, strategies and tactics for developing sustainable competitive advantage in the global hospitality industry.
3. Design marketing strategies that will promote and sustain positive guest/customer relationships
4. Apply concepts of digital marketing to hospitality organizations.

HRTM 505. Hospitality Research Methods & Analysis**3 Credits (3)**

Application of appropriate statistical procedures and research methodologies within the hospitality industry. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Analyze hospitality operational data.
2. Develop the framework for researching hospitality operations and organizations.
3. Implement appropriate statistical procedures and research methodologies to hospitality operations.
4. Examine problems in hospitality, formulate and clarify research topics to address these problems

HRTM 506. Contemporary Global Issues in Hospitality**3 Credits (3)**

Contemporary issues confronting the global hospitality industry. Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Discuss contemporary issues confronting the global hospitality industry.
2. Project how contemporary global issues will impact hospitality organizations.
3. Evaluate new developments in hotel and restaurant management

HRTM 510. Hospitality Cost Control**3 Credits (3)**

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers). Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. Same as HRTM 410 with additional work for graduate credit. Consent of Instructor required.

HRTM 511. Hospitality Financial Analysis**3 Credits (3)**

Financial and accounting decision processes as applied to the hospitality industry. Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Use the Uniform Systems of Accounts for the Lodging and Restaurant industries, and accounting and financial reporting standards and procedures for the hospitality industry.
2. Use hospitality financial and accounting tools such as REVPAR and Food Cost Percentage to analyze hospitality operations
3. Define and apply terminology and principles required to develop and analyze Hospitality Management financial statements.
4. Analyze and interpret hospitality accounting and financial statements
5. Perform financial and accounting decision making as applied to the hospitality industry.

HRTM 512. Beverage Management**3 Credits (3)**

Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. Same as HRTM 412 with additional work for graduate credit. Consent of Instructor required.

HRTM 515. Applied Management Project**3 Credits (3)**

Students will develop a project scope based on problems presented within the hospitality industry. Projects incorporate concepts and skills developed in previous coursework. Students will take this course in their last semester of the Master of Hospitality Degree. Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Develop a project scope based on problems presented within the hospitality industry.
2. Use collaborative problem solving to execute the project.
3. Define and identify a business research problem and explain its importance to study.
4. Identify sources and strategies for locating related literature.
5. Plan research regarding the business problem.
6. Write the professional paper.
7. Present the professional paper.

HRTM 516. Hotel, Restaurant and Tourism Industry Purchasing, Selection and Procurement**3 Credits (3)**

Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment.

Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 530. Facilities Management**3 Credits (3)**

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant. Same as HRTM 430 with additional work for graduate credit. Consent of Instructor required.

HRTM 531. Hotel Operations II**3 Credits (3)**

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. Same as HRTM 431 with additional work for graduate credit. Consent of Instructor required.

HRTM 532. Hotel Revenue and Sales Management**3 Credits (3)**

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. Same as HRTM 432 with additional work for graduate credit. Consent of Instructor required.

HRTM 535. Resort Management**3 Credits (3)**

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities.

Prerequisite(s): Consent of instructor.

HRTM 536. Sustainability in the Hospitality Industry **3 Credits (3)**

This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry.

Learning Outcomes

1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 543. Meetings, Conventions and Special Events **3 Credits (3)**

Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation. Same as HRTM 443 with additional work for graduate credit. Consent of Instructor required.

HRTM 546. Methods for Teaching Hospitality and Culinary Education **3 Credits (3)**

Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences Restricted to: HRTM minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Compare and contrast curriculum theories.
2. Develop syllabi for hospitality courses using theories and models of course design.
3. Apply instructional techniques in hospitality education.
4. Design tests and other assessments for hospitality courses.
5. Write a teaching philosophy.

HRTM 550. The World of Hospitality Higher Education **3 Credits (3)**

Survey of the history, organization, and administration of hospitality higher education programs. Explores differences between types of degree programs – associate, bachelor, graduate and sources of funding – public, private, proprietary. Investigates the role of the faculty member in non-instructional activities, such as working with administrative and support departments, accreditation, service, community outreach, fundraising, and industry relations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Discuss the history of higher education and hospitality management programs.
2. Analyze how general higher education principles, laws, and finance apply to hospitality management programs.
3. Compare the characteristics, administration, and operations of programs based on type of degrees offered.
4. Compare the characteristics, administration, and operations of programs based on sources of funding.
5. Analyze the role of the faculty in hospitality education in collaborating with various educational departments and support services.
6. Analyze the role of the faculty in hospitality education in collaborating with external stakeholders.

HRTM 590. Special Topics **1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

Prerequisite: consent of instructor.

HRTM 598. Special Research Programs **1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

Prerequisite: consent of instructor.

HRTM 599. Master's Thesis **1-6 Credits (1-6)**

Thesis.

Prerequisite: consent of instructor.

HVAC-HEATING/AC/REFRIGERATION

HVAC 100. EPA Clean Air Act: Section 608 **1 Credit (1)**

Refrigerant certification preparation to include basics of refrigerant bearing equipment, ozone depletion and the new legislation, technician categories covered and the certification examination.

HVAC 101. Fundamentals of Refrigeration **4 Credits (3+2P)**

Refrigeration cycle and the various mechanical components. Use of special tools, equipment, and safety precautions.

HVAC 102. Fundamentals of Electricity **4 Credits (3+2P)**

Introduction to electricity theory, OHM's Law, circuits, AC/DC, and practical applications.

HVAC 103. Electrical and Mechanical Controls I**4 Credits (3+2P)**

Applications of basic electrical and mechanical controls. Reading and drawing diagrams of simple refrigerating equipment. Safe use of testing equipment.

Prerequisites: HVAC 101 and HVAC 102, or consent of instructor.

HVAC 110. Professional Development and Leadership**1 Credit (1)**

As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing in Skills USA are required to register for the course. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: HVAC majors. Graded: S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

HVAC 113. Job Shadowing**1 Credit (1)**

Course will expose students to actual HVAC/R field work and provide them knowledge of the expectations of field work as they shadow an HVAC/R technician. Consent of instructor required. Restricted to: Community colleges only.

HVAC 205. Commercial Refrigeration Systems**4 Credits (3+2P)**

Service and maintenance of commercial refrigeration equipment to include evacuation and charging procedures, electrical diagrams, and compressors and accessories.

Prerequisites: HVAC 103 or consent of instructor.

HVAC 207. Residential Air Conditioning Systems**4 Credits (3+2P)**

Applications and types of equipment used in comfort cooling. Preventive maintenance, service, and repairs common to evaporative coolers and refrigerated air conditioning systems. Air properties and psychometrics.

Prerequisite: HVAC 103 or consent of instructor.

HVAC 209. Residential Heating Systems**4 Credits (3+2P)**

Gas and electric systems used in comfort heating. Maintenance procedures, safety, troubleshooting, and servicing malfunctions in equipment.

Prerequisite: HVAC 103 or consent of instructor.

HVAC 210. Commercial Air Conditioning and Heating Systems**4 Credits (3+3P)**

Covers troubleshooting mechanical and electrical problems associated with HVAC equipment in commercial buildings. Includes gas, electric, and heat pump systems. Restricted to Community Colleges campuses only.

Prerequisite(s): HVAC 103 or consent of instructor.

HVAC 211. Heat Pump Systems**4 Credits (3+2P)**

Reverse cycle refrigeration systems utilized in comfort heating and cooling. Troubleshooting mechanical electrical problems associated with heat pumps. HVAC 103 or consent of instructor.

HVAC 213. Practicum**3 Credits (3)**

Working in the field with journeymen service technicians. Develop and apply job skills. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HVAC majors. Restricted to Community Colleges campuses only.

Prerequisite(s): HVAC 113 and Consent of instructor.

HVAC 220. Introduction to Sheet Metal Fabrication**4 Credits (3+2P)**

Introduction to sheet metal fabrication to include hands-on practical laboratory applications, cutting and forming procedures, identifying types and gauges. Design and layout techniques.

Prerequisite: OETS 118 or equivalent math or consent of instructor.

HVAC 225. New Mexico Mechanical Codes: HVAC**1-4 Credits**

Principles and regulations developed for HVAC, sheet metal, and plumbing occupations to include terminology, ventilation air supply, exhaust systems, duct systems, combustion air, chimneys and vents, boilers/water heaters, refrigeration, panel and hydronic panel heating, fuel gas piping, storage systems, solar systems, and workmanship standards. May be repeated for a maximum of 12 credits.

HVAC 255. Special Topics**1-6 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

HVAC 290. Special Problems**1-4 Credits**

Individual studies related to heating, air conditioning, and refrigeration.

Prerequisites: HVAC 101, HVAC 102, and consent of instructor.

I B-INTERNATIONAL BUSINESS

I B 317. International Marketing**3 Credits (3)**

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as MKTG 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues.
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

I B 351. International Business**3 Credits (3)**

The various aspects of international business, and identification and analysis of problems encountered by multinational companies.

Prerequisite: junior standing or consent of instructor.

I B 398. International Business and Economic Environments**3 Credits (3)**

Description and analysis of various world regions, e.g., Pacific Rim, Eastern Europe, South Asia. Region will vary from semester to semester.

I B 449. Open Economy Macroeconomics**3 Credits (3)**

This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: ECON 449.

Prerequisite(s): BFIN 341 OR ECON 311.

I B 450. International Economics**3 Credits (3)**

Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: ECON 450G

Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

I B 475. International Finance**3 Credits (3)**

International aspects of financial transactions, decision-making, banking and financial markets. Crosslisted with: BFIN 475 and BFIN 575.

Prerequisite(s): BFIN 341.

I B 489. Senior Seminar in International Business**3 Credits (3)**

Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project.

Prerequisite: I B core.

I E-INDUSTRIAL ENGINEERING

I E 151. Computational Methods in Industrial Engineering**3 Credits (3)**

History, social implications, and application of computers and an introduction to computer programming, word processing, and database management systems. Satisfies General Education computer science requirement.

Prerequisite: MATH 1220G.

I E 200. Special Problems-Sophomore**1-3 Credits**

Directed individual projects. May be repeated for a total of 3 credits.

Prerequisite: consent of faculty member.

I E 217. Manufacturing Processes**3 Credits (3)**

Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: E T 217.

Prerequisite: E T 110 and MATH 1220G.

Learning Outcomes

1. Various

I E 300. Special Problems-Junior**1-3 Credits**

Directed individual projects. May be repeated for a total of 3 credits.

Prerequisite: consent of faculty member.

I E 311. Engineering Data Analysis**3 Credits (3)**

Methodology and techniques associated with identifying and analyzing industrial data.

Prerequisite: C- or better in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to correctly interpret statistical reports
2. Ability to correctly identify and solve problems involving continuous and discrete probability and random variables.
3. Ability to correctly analyze random samples using methods that include: point estimates, confidence intervals, tests of hypothesis, analysis of variance (ANOVA), and linear regression.

I E 316. Methods Engineering**3 Credits (2+3P)**

Methods analysis and design. Work measurement techniques. Job evaluation and wage incentive methods. May be repeated up to 3 credits.

Prerequisite(s): I E 217, I E 311, E T 110.

I E 351. Applied Problem Solving in Industrial Engineering**3 Credits (3)**

Application of computational techniques to engineering problems including the use of commercial programs in statistics and applied mathematics. Restricted to majors.

Corequisite(s): I E 311.

I E 365. Quality Control**3 Credits (3)**

Statistical analysis of quality in manufacturing. Acceptance sampling and control charts.

Prerequisite: I E 311 or equivalent.

I E 375. Manufacturing Processes II**3 Credits (3)**

Review of basic manufacturing processes. Advanced topics in casting, forming, machining and joining; major process parameters; economics of processes.

Prerequisite: I E 217 or E T 217.

I E 382. Business for the Practicing Engineer**3 Credits (3)**

Business tools and skills, including technology commercialization, patent applications, preparing a technology-oriented business plan, reading and constructing financial documents, modeling and understanding markets, e-commerce, QFD, concurrent engineering, engineer's role in the global economy, and engineer's impact on product design and cost.

Prerequisite: engineering major, junior level or above.

I E 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of faculty member.

I E 411. Occupational Safety**3 Credits (3)**

Practical methods to improve safety in the workplace. Topics include OSHA and other regulations, hazard recognition, assessment and control, industry standards, risk assessment and safety management. Material is applicable to a variety of workplace settings. This course is intended for College of Engineering students who have completed their lower-division requirements in mathematics, engineering, technology, and basic science. Same as I E 561 with differential assignments. Prerequisite: Junior standing

I E 413. Engineering Operations Research I**3 Credits (3)**

Deterministic operations research modeling including linear and integer programming.

Prerequisite: MATH 1521G or MATH 1521H or ENGR 190.

Corequisite: MATH 480.

Learning Outcomes

1. Ability to model optimization problems that can be solved by linear optimization.
2. Ability to solve linear optimization problems
3. Ability to interpret solutions of linear optimization problems in the context of the larger problem.

I E 423. Engineering Operations Research II**3 Credits (3)**

Probabilistic operations research modeling, including queuing systems and their optimization; Markov chains. May be repeated up to 3 credits.

Prerequisite(s): I E 311.

Corequisite(s): MATH 392.

I E 424. Manufacturing Systems**3 Credits (3)**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling, and inventory control.

Prerequisite: I E 311.

I E 451. Engineering Economy**3 Credits (3)**

Discounted cash flows, economics of project, contract and specifications as related to engineering design.

I E 456. Large Scale Systems Engineering**3 Credits (3)**

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to describe the systems engineering standards and best practices
2. Ability to characterize the limitations of the way that current systems engineering is practiced in terms of dealing with lifecycle uncertainty.

I E 459. Systems Thinking and Decision Making**3 Credits (3)**

A general introduction to systems engineering. Topics include General Systems Theory, Systems Thinking and emerging concepts, Systems Dynamics approaches for modelling and analyzing non-linear feedback mechanisms in complex systems, and Complexity science and complex adaptive systems. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to understand the complexities of engineering systems, and the implications of change on system behavior
2. Ability to understand the nature of complex systems in respect to people, processes, the environment and development organization
3. Ability to understand Systems Thinking's' role and value within organizations
4. Ability to recognize the advantages, as well as the flaws of our present predominant way of thinking (Cartesian), while looking at the changes that would enable us to deal with complex issues in daily practice (Systems Thinking)
5. Ability to recognize the value and limitations of modeling and simulation as well as how to construct and interpret various models to support decision making.

I E 460. Evaluation of Engineering Data**3 Credits (3)**

Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods.

Prerequisite: I E 311 or equivalent.

I E 466. Reliability**3 Credits (3)**

Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data.

Prerequisite: I E 311 or equivalent.

I E 467. Discrete-Event Simulation Modeling**3 Credits (3)**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments. May be repeated up to 3 credits.

Prerequisite(s): I E 311 or equivalent.

I E 468. Advanced Discrete-Event Simulation Applications**3 Credits (3)**

Semester long project involving development and application of advanced simulation skills. May be repeated up to 3 credits.

Prerequisite: I E 467.

Learning Outcomes

1. Ability to understand the techniques of computer simulation modeling in the context of hierarchy of knowledge about a system and develop the capability to apply the same to study systems through available computer simulation software

I E 478. Facilities Planning and Design**3 Credits (3)**

Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies.

Prerequisite(s): I E 316.

Prerequisite(s)/Corequisite(s): I E 424.

I E 480. Senior Design**3 Credits (2+3P)**

Multi-disciplinary team design project for external clients. Involves semester long activities including major design report and presentation.

Prerequisites: senior standing, I E 467.

I E 490. Selected Topics**1-3 Credits**

May be repeated for a maximum of 9 credits.

Prerequisite: consent of the head of the department.

I E 505. Directed Readings**1-3 Credits**

May be repeated for a maximum total of 6 credits.

Prerequisite: consent of the head of the department.

I E 511. Survey of Industrial Engineering**3 Credits (3)**

A project-based course covering methods of engineering, plant layout, production and inventory control, economic analysis, etc. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to apply the various techniques of Industrial Engineering to solve real-life problems

I E 515. Stochastic Processes Modeling**3 Credits (3)**

Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting.

Prerequisites: I E 311 or equivalent; and MATH 392 or equivalent.

I E 522. Queuing Systems**3 Credits (3)**

Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications.

Learning Outcomes

1. Ability to model, analyze, and apply solutions to problems involving queueing systems
2. Ability to read and understand literature in the queueing system analysis field.

I E 523. Advanced Engineering Economy**3 Credits (3)**

Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523.

I E 524. Advanced Production and Inventory Control**3 Credits (3)**

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments.

I E 525. Systems Synthesis and Design**3 Credits (3)**

Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities.

I E 530. Environmental Management Seminar**1 Credit (1)**

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Same as C E 530, E E 530, CHME 530.

I E 533. Linear Programming**3 Credits (3)**

Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis.

I E 534. Nonlinear Programming**3 Credits (3)**

Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods.

Learning Outcomes

1. Ability to model situations which may be solved by nonlinear optimization and to interpret the results in the context of the larger problem
2. Ability to employ several computer tools to correctly solve nonlinear optimization problems.
3. Ability to read and understand literature in the field of nonlinear optimization
4. Ability to select appropriate methods and algorithms from a core representative set of methods and tools to solve nonlinear optimization problems

I E 535. Discrete Optimization**3 Credits (3)**

Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms.

I E 537. Large Scale Systems Engineering**3 Credits (3)**

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making.

I E 545. Characterizing Time-Dependent Engineering Data**3 Credits (3)**

Theory and techniques employed in the characterization of stochastic processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed.

Learning Outcomes

1. Ability to characterize a process, based on data that is time-dependent or sequential in nature.

I E 561. Advanced Safety Engineering**3 Credits (3)**

Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis.

Prerequisite: graduate status in engineering.

I E 563. Topics in Engineering Administration**3 Credits (3)**

Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.

I E 567. Design and Implementation of Discrete-Event Simulation**3 Credits (3)**

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.

I E 571. Advanced Quality Control**3 Credits (3)**

Advanced topics in quality control and design of experiments for improvement of quality.

Prerequisite: I E 311 or equivalent.

I E 575. Advanced Manufacturing Processes**3 Credits (3)**

Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions.

Prerequisite: graduate standing.

I E 590. Selected Topics**1-3 Credits**

May be repeated for a maximum of 9 credits.

Prerequisite: consent of the head of the department.

I E 598. Special Research Programs**1-3 Credits**

Individual analytical or experimental investigations. May be repeated for a maximum total of 6 credits.

Prerequisite: consent of instructor.

I E 599. Master's Thesis**1-15 Credits**

Thesis.

I E 610. Topics in Operations Research**3 Credits (3)**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

I E 620. Topics in Computer Modeling**3 Credits (3)**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

I E 630. Topics in Engineering Management**3 Credits (3)**

Selected topics of current interest, to be designated by subtitle. May be repeated for a maximum of 6 credits.

I E 690. Selected Topics**1-15 Credits**

May be repeated.

Prerequisite: consent of department head.

I E 700. Doctoral Dissertation**15 Credits**

Dissertation.

ICT-INFO & COMMUNICATION TECH

ICT 141. IT Essentials I: A+ Certification Training Focused on the Hardware Exam**3 Credits (3)**

Installing, configuring, troubleshooting, and maintaining personal computer hardware components and will assist in preparation for the CompTIA A+ Hardware certification.

Learning Outcomes

1. Configure and support PC, mobile, and IoT device hardware.
2. Perform basic computer diagnostic and maintenance operations.
3. Implement basic data backup and recovery methods.
4. Apply basic hardware maintenance best practices.
5. Demonstrate baseline security practices for hardware.

ICT 145. Network Essentials: N+ Certification Training**3 Credits (3)**

Focuses on the installation and administration of network communication systems and will assist in preparation for the CompTIA N+ Network certification.

Learning Outcomes

1. Explain basic networking concepts including network services, physical connections, topologies, and architecture.
2. Explain security concepts and network attacks in order to harden networks against threats.
3. Explain routing technologies and networking devices; deploy Ethernet solutions and configure wireless technologies.
4. Troubleshoot common cable, connectivity, and software issues related to networking.
5. Monitor and optimize networks to ensure business continuity.

ICT 152. Java Programming**3 Credits (3)**

Programming in the Java language.

Learning Outcomes

1. Set up a rich programming environment.
2. Analyze existing code.
3. Create/modify/debug/test programs.
4. Employ software documentation and programming best practices.

ICT 161. IT Essentials II: A+ Certification Training focused on the Software exam**3 Credits (3)**

Installing, configuring, troubleshooting, and maintaining personal computer operating systems and will assist in preparation for the CompTIA A+ Software certification.

Prerequisite: A grade of C- or better in ICT 141.

Learning Outcomes

1. Configure device operating systems, including Windows, Mac, Linux, Chrome OS, Android, and iOS.
2. Administer client-based and cloud-based software.
3. Troubleshoot and problem-solve core service and support challenges.
4. Apply best practices for documentation, change management, and scripting.
5. Support basic IT infrastructure and networking.

ICT 220. Discrete Math and Its Relationship to Information Technology**3 Credits (3)**

Focuses on developing software coding skills using a programming language and its application to discrete mathematics, the use discrete structures in computer science. Topics included are logic, sets, relations, functions, methods of proof, recursion, combinatorics, graph theory, and algorithms

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Corequisite: ICT 152.

Learning Outcomes

1. Explain the relationship between discrete math sets and coded arrays, finite and infinite, subsets, intersection, unions, and other set operations.
2. Explain binary Trees and know how to use demonstrate them using code.
3. Demonstrate the use of code applied to group and subgroup theory.
4. Demonstrate the use of code to create functions and algorithms.
5. Identify and explain logical operations and their application in coding.
6. Demonstrate the use of Probability Theory in code to predict random outcomes.

ICT 267. Information Security+ Certification Preparation**3 Credits (3)**

The course covers the Sec+ exam objectives and detailed preparation for certification in information security.

Prerequisite: A grade of C- or better in both, ICT 141 and ICT 145.

Learning Outcomes

1. The student will select appropriate mitigation and deterrent techniques to address network attacks and vulnerabilities.
2. The student will examine how access control, identity management, and cryptography can secure a network and manage risk.
3. The student will identify privacy and policy issues.
4. The student will apply activities that an Information Systems Security specialist would normally carry out in the performance of his/her duties.

ICT 280. Introduction to Web Development**3 Credits (3)**

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works.

Learning Outcomes

1. Explain the Document Object Model of HTML5 web pages.
2. Organize web page contents with Lists, figures, and organizational elements.
3. Develop web page layout templates.
4. Implement style application inline, via style blocks, and using external resources.
5. Develop and apply javascript event-driven programming to web pages.
6. Explain the difference between client and server-side scripting and data processing.

ICT 300. Special Topics**3 Credits (3)**

Directed study or project. Students must be in Junior standing and have the consent of department head to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Various.

ICT 320. Introduction to Internet Protocols**3 Credits (3)**

Present a overview of Internet Protocols Applications. Students must be in Junior or Senior standing only.

Learning Outcomes

1. Students will apply an understanding of basic Networking.
2. Students will employ effective use of Packet analysis software to troubleshoot network issues.
3. Explain the RFC process for developing network protocols.
4. Explain network protocol security implications.

ICT 339. Introduction to Digital Forensics and Incident Response**3 Credits (3)**

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.

Prerequisite: A grade of C- or better in ICT 360.

Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

ICT 350V. Introduction to Personal Computer Security and Privacy
3 Credits (3)

Introduction to Information Security and Privacy – Have you ever wondered what happens to all of your browsing history or data you fill out on websites go? Who has this data? What do they do with this data? How do you stop sharing your private information? This class will answer those questions and provide steps to make your online presence more secure.

Learning Outcomes

1. Classify security issues
2. Classify Privacy protections
3. Evaluate threats and countermeasures based on personal security breaches.
4. Formulate a real-time privacy response
5. Assess international privacy protections through a multicultural focus.

ICT 352. Software Technology I**3 Credits (3)**

This course focuses on reading, writing, debugging, testing, and documenting computer programs. May be repeated up to 3 credits.

Learning Outcomes

1. Set up a rich programming environment
2. Analyze existing code
3. Create/modify/debug/test programs
4. Employ software documentation and programming best practices

ICT 355. Linux System Administration**3 Credits (3)**

Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup, and Maintenance of Linux Servers.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 360. Operating Systems for ICT**3 Credits (3)**

Fundamentals of operating systems with Windows and Linux including installation and configuration using the GUI as well as the command line, text editors, file systems, scripting and operating system management.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Create multiple Operating Systems in a Virtual Environment.
3. Manage error codes in Virtual Machines.
4. Support the operation of the CentOS GUI and Windows Operating Systems.

ICT 362. Software Technology II**3 Credits (3)**

Topics include problem analysis, object-oriented programming (OOP), structured logic, and development concepts. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in ICT 152 or ICT 352 or E T 262 or OECS 195 or C S 152 or C S 172.

Learning Outcomes

1. Set up and use a rich programming environment for programming with Python.
2. Analyze existing code.
3. Employ effective use of basic programming and basic troubleshooting.
4. Employ effective use of Object-Oriented Programming (OOP) and troubleshooting.
5. Apply testing and documentation best practices.

ICT 364. Windows Enterprise Administration**3 Credits (3)**

Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.

Prerequisite: A grade of C- or better in ICT 352 or E T 262 or OECS 195 or C S 152 or C S 172.

Learning Outcomes

1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational Structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPvfour and IPvsix.
4. Analyze existing cmd shell and PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-domain trust relationship.
7. Employ effective use of the WDS service to deploy template images.

ICT 372. Software Engineering and Design**3 Credits (3)**

Topics include the software development lifecycle, problem analysis, and implementing software testing routines to improve the quality, integrity, and security of code.

Prerequisite: A grade of C- or better in ICT 362.

Learning Outcomes

1. Identify, explain, and apply the phases of the SDLC.
2. Identify different Agile methodologies and practices for software project management.
3. Use different development tools and apply best practices.
4. Apply best practices in the creation of business objects, data storage and access, testing, and debugging.
5. Configuring, handling, testing, and deploying services.

ICT 377. Computer Networking I**3 Credits (3)**

Computer network design and applications for LAN, TCP/IP networks, routing and switching technologies, VLANs, and the OSI layers from physical to transport.

Prerequisite/Corequisite: A grade of C- or better MATH 1220G or higher.

Learning Outcomes

1. Define and distinguish the role of a network administrator (from other roles in the IT world).
2. Identify the OSI model, its layers, and the relationship to the TCP/IP model.
3. Identify different cable media and networking devices and their use.
4. Design, configure and troubleshoot basic networks.
5. Identify MAC, IPvfour, and IPvsix addressing.
6. Apply different techniques for IP allocation and subnet design (IPvfour).
7. Use the Cisco IOS software for basic switch and router configurations.
8. Configure and troubleshoot basic setup for static and dynamic routing protocols.

ICT 380. Web Design and Multimedia**3 Credits (3)**

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.

Learning Outcomes

1. Create multiple front-end development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

ICT 400. Special Topics**1-3 Credits (1-3)**

Directed study or project. Students must be in Senior standing and have the consent of department head to enroll. May be repeated up to 6 credits.

Learning Outcomes

1. Various.

ICT 435. Senior Project**3 Credits (3)**

Capstone course. Practical application of student's cumulative knowledge to an assigned design project. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required. Restricted to ICT Majors.

Prerequisite: A grade of C- or better in the following: ICT 364 and ICT 377 and (ICT 462 or ICT 355).

Learning Outcomes

1. Demonstrate ability to manage a complex technical project.
2. Demonstrate the ability to create an engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project.
4. Demonstrate the ability to work in teams and execute project.
5. Goal setting, skills assessment and portfolio development included.

ICT 439. Advanced Digital Forensics and Incident Response**3 Credits (3)**

Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.

Prerequisite: A grade of C- or better in both, (E T 339 or ICT 339) and (E T 377 or ICT 377).

Learning Outcomes

1. Demonstrate the use of forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
2. Demonstrate proper incident response procedures and proper chain of custody when handling digital evidence.
3. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
4. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

ICT 450. Ethical Hacking**3 Credits (3)**

Ethical Hacking and Penetration testing techniques. Students must be in senior standing to enroll.

Prerequisite: A grade of C- or better in ICT 350V.

Learning Outcomes

1. Analyze networking concepts as they relate to hacking vulnerabilities.
2. Define contract requirements necessary to avoid legal liability during Ethical Hacking.
3. Employ tools and techniques to scan and do reconnaissance on potential targets.
4. Demonstrate use of vulnerability testing tools to identify vulnerabilities and exploits.
5. Identify the role of sniffers and session Hijacking in Ethical Hacking.
6. Demonstrate the use of Social Engineering tools and techniques used in Ethical Hacking.

ICT 457. Introduction to Information Security Technology**3 Credits (3)**

This course provides an overview of security challenges and strategies of countermeasure in the information systems environment. Topics include definition of terms, concepts, elements, and goals incorporating industry standards and practices with a focus on availability, vulnerability, integrity and confidentiality aspects of information systems.

Learning Outcomes

1. Demonstrate an understanding of the information security concepts.
2. Demonstrate an understanding of the diversity of potential attacks against an organization.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

ICT 458. Web Development and Database Applications**3 Credits (3)**

Design, planning, and building of interactive and dynamic web applications. Topics include relational databases, object oriented programming, and web security.

Prerequisite/Corequisite: ICT 362.

Learning Outcomes

1. Setting up a development server.
2. Read, design, and write code for backend web dev.
3. Design, create, and access databases that support web applications.
4. Implement effective security and authentication on Web applications.

ICT 460. Multimedia Tools and Support**3 Credits (3)**

Introduction to video, audio and other digital presentation methods. Addresses the latest multimedia technology advances and how they apply to the information and communication technology fields. Sample tools like ffmpeg, and Audacity are covered. Students must be in senior standing to enroll.

Prerequisite: A grade of C- or better in ICT 360.

Learning Outcomes

1. To understand the concepts related to Multimedia, Digital footprint, and Computer Graphics.
2. To become familiar with visual design basics and know the requirements for typography and logo design.
3. To learn about the concept of sound signals, digital file formats for sound and multimedia sound systems.
4. To perform digital audio editing, audio clip introduction and podcast creation.
5. To create, edit and add effects to digital video podcast, intros, and trailers.
6. To learn about Website creation and its significance in the current multimedia trends.
7. To become familiar with content curation, social media, blogs and how to create them.
8. To integrate all concepts covered in the course into an informative/ educational website.

ICT 462. Linux System Administration**3 Credits (3)**

Operating system applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 463. Enterprise Linux Administration**3 Credits (3)**

Advanced Linux Includes an advanced look at the use of Coding repositories, Linux-based containers, virtual machines, and scripting tools including Dockerfiles, Vagrantfiles, and Ansible. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in (ICT 355 or ICT 462).

Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrastructure management software to deploy defined roles in multiple environments.

ICT 467. Communication Network Security**3 Credits (3)**

The course provides a technical perspective on maintaining the security of communication network systems. It covers a wide range of technical issues, including wired, wireless and Internet communication fundamentals, communication network security mechanisms and configuration, standards and protocols, vulnerabilities, attacks and countermeasures.

Prerequisite: A grade of C- or better in both, ICT 320 and ICT 377.

Learning Outcomes

1. Demonstrate an understanding of key and basic communication network security concepts, terminologies, standards, issues, and policies.
2. Apply the principles of network security techniques such as Cryptography, Cryptanalysis, Biometrics, Watermarking, and Stenography.
3. Implement security techniques with commonly available network security software.
4. Examine the fundamentals of Wired and Wireless communication network systems including Cellular, Bluetooth, Wi-Fi, Internet, Cloud Networking, and the Internet of Things.
5. Explain the TCP/IP security protocols that pertain to communication network systems.
6. Explain the security attacks, threats, risks, mechanisms, and tools associated with and used for securing network devices especially mobile devices.
7. Demonstrate an understanding of the operation and countermeasures against Malwares in network systems and the implementation of intrusion detection and prevention, and firewall technologies.

ICT 477. Computer Networking II**3 Credits (3)**

Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security as well as network monitoring.

Prerequisite: A grade of C- or better in either ICT 377 or E T 377 or CTEC 285.

Learning Outcomes

1. VLSM, Summarization, and the TCP/IP model.
2. Understanding of IPv6 basics
3. Configuration of routing protocols using IPv6
4. Configuration of advanced router configurations
5. Configuration of route redistribution, DHCP, DNS, NAT and PAT
6. Configure network security and Access Control Lists (ACLs)
7. Perform basic analysis of network data traffic
8. Create, test and troubleshoot software simulations (Cisco Packet Tracer)

ICT 487. Data Security**3 Credits (3)**

This course explores the principles of information assurance, with emphasis on current threats and vulnerabilities to develop an information security plan to mitigate risk. Information security and assurance issues are explored, and a multidisciplinary approach is discussed that examines security policies, models, and mechanisms for confidentiality, integrity, and availability. Technical controls are emphasized.

Prerequisite: A grade of C- or better in both, ICT 320 and ICT 360.

Learning Outcomes

1. Demonstrate a basic understanding of security risk management.
2. Demonstrate basic cryptographic functionality, including symmetric ciphers, public-key encryption, digital signatures, hash functions, and related concepts.
3. Examine how basic cryptographic building blocks are combined to meet high-level security goals in protocols like SSL and IPsec.
4. Justify the use of particular technologies, settings, and parameters to meet specified security goals.
5. Evaluate the security of systems that use cryptography and secure communication techniques.
6. Explain how privacy issues can impact system design.

INMT - INDUSTRIAL MAINTENANCE

INMT 133. Process Technology and Systems**4 Credits (4)**

Provides instruction in the use of common process equipment. Students will use appropriate terminology and identify process equipment components such as piping and tubing, valves, pumps, compressors, turbines, motors, engines, heat exchangers, heaters, furnaces, boilers, filters dryers and other miscellaneous vessels. Included are the basic functions, scientific principles and symbols. Students will identify components on typical Process Flow Diagrams and Process and Instrument Diagrams. Restricted to Carlsbad campus only.

INMT 134. Maintenance Principles**4 Credits (4)**

The course is an introduction to the maintenance of equipment utilizing mechanical, electrical and instrumentation concepts. Topics include: hand tools, bearing fundamentals, equipment lubrication, material handling, electrical safety, battery systems, diagrams, electrical production and distribution, transformers, breakers, switches, AC and DC motors, motor controllers and operations, and introduction to automation and instrumentation control. Restricted to Carlsbad campus only.

INMT 165. Equipment Processes**4 Credits (4)**

This course introduces power transmission equipment and machinery components, including belt/chain driven equipment, speed reducers, variable speed drives, couplings, clutches, and conveying equipment. Students will learn the operation, maintenance, and troubleshooting for these types of equipment. The course also includes Overhead Crane Certification and Safety. Restricted to Carlsbad campus only.

INMT 205. Programmable Logic Controllers and Applications**4 Credits (4)**

Students learn about programmable logic controllers; architecture; programming, interfacing, and applications. Hands-on experience on modern commercial PLC units is the main component. Restricted to Carlsbad campus only.

Prerequisite(s): BCIS 1110.

INMT 223. Electrical Repairs**4 Credits (4)**

This course outlines for students the types of problems that occur in electrical machinery and systems. The course covers trouble-shooting and diagnosis, preventative maintenance, and how to make necessary repairs. Restricted to Carlsbad campus only.

INMT 235. Mechanical Drives I**4 Credits (4)**

This course teaches the fundamentals of mechanical transmission systems used in industrial, agricultural, and mobile applications. Students will learn industrial relevant skills including how to: operate, install and analyze performance, and design basic transmission systems using chains, feed-belts, spur gears, bearings, and couplings. Vibration analysis will be used to determine when to perform maintenance of power transmission components. The course also covers power transmission safety, and introduction to belt and chain drives (applications, installations, and tensioning), and introduction to gear drives, coupling, and bearing, basic troubleshooting, blueprint and print reading, learning the basics of electrical drives and PDM and PM. Restricted to Carlsbad campus only.

INMT 237. Hydraulics I**2 Credits (2)**

This course teaches fundamentals of hydraulic systems used in industry mobile application. Students learn the basic theory of application of hydraulic and electricity as it applies to hydraulics. Covered in the course are basic systems, principles of flow, pressure, viscosity, filtration, and colling. Also covered are basic components such as motor, pumps, cylinders, piping and control and relief valves. Troubleshooting strategies are discussed, along with blueprint and print reading, and PDM and PM. Industry, relevant skills including how to operate, install, analyze performance, and design basic hydraulic systems, reviewing intermediate hydraulic components and system applications. Restricted to Carlsbad campus only.

INMT 261. Pump Operations I**4 Credits (4)**

This course teaches how to select, operate, install, maintain and repair the many types of pumps used by industry. Students learn the theory and practical application of all types of processed pumps and pipe systems. It covers types, components, and systems operation. It also covers troubleshooting for flow loss and cavitation. Students learn how to select, operate, install, maintain and repair the many types of pumps used by industry. Other topics covered include: Net Positive Suction Head, pump flow/head measurement, pressure head conversion, pressure flow characteristics, cavitation, series/parallel pump operation, mechanical seal/stuffing box maintenance, multi stage operation and construction, positive displacement pumps, turbine, diaphragm, peristaltic, piston, gear, and magnetic pump systems. Restricted to Carlsbad campus only.

INMT 262. Piping Systems**2 Credits (2)**

This course teaches students how to install, maintain and troubleshoot fluid systems such as how to select, size, identify, install a variety of types of piping, fittings, and valves. Measurement techniques from basic to precision measurement, gauging, including the fundamentals of demonsioning and tolerancing will taught. Restricted to Carlsbad campus only.

INMT 263. Mechanical Drives II**4 Credits (4)**

This course teaches the bearings and gears used in heavy duty mechanical transmission systems. This course will emphasize linear access drives, clutches, and brakes. In addition, this course teaches how to set up, operate and apply laser shaft alignment to a variety of industrial applications. This course is a study of the basic concepts and procedures for the maintenance and operations of pumps, turbines, seals, bearings, and compressors. The course will provide the student with the knowledge and skills necessary to perform proper maintenance, repair, replacement and selection of pumps, turbines, seals, bearings and compressors. Also covered are advanced gearbox, coupling and bearings, precision alignment (shaft, flange, and sheave), as well as basic vibration analysis and thermography as troubleshooting and RCA aids. Restricted to Carlsbad campus only.

INMT 264. Rigging**2 Credits (2)**

This course teaches how to safely move loads of different shapes and sizes using a variety of different methods. Students will lift loads and demonstrate how to move it. Students will use hoists, slings, ropes and fittings to learn how to safely lift a wide variety of loads. Included are weight estimation, lifting rules, load ratings (sling, wire, ropes and hoists). Restricted to Carlsbad campus only.

INMT 265. Hydraulics II**2 Credits (2)**

This course teaches advanced hydraulics systems. The student will learn operation of advanced hydraulic systems applications, equipment installation, performance analysis of motors and pumps, accumulators, control, relief and check valve, equipment maintenance, and system design. The course covers accumulators, sequence valves, pilot circuits and unloader valves. Students learn more troubleshooting, hydraulic drives and other applications. Restricted to Carlsbad campus only.

INMT 267. Pump Operations II**2 Credits (2)**

This course teaches the student the disassembly, inspection and reassembly of centrifugal and positive displacement pumps. This course allows the student to identify and replace worn or broken components of pumps, and learn predictive and preventive maintenance principles. Lockout of the pump will be performed in addition to measurements and alignment. Restricted to Carlsbad campus only.

INST-INSTRUMENT & CONT TECH

INST 133. Process Technology and Systems**4 Credits (4)**

Provides instruction in the use of common process equipment. Students will use appropriate terminology and identify process equipment components such as piping and tubing, valves, pumps, compressors, turbines, motors, engines, heat exchangers, heaters, furnaces, boilers, filters dryers and other miscellaneous vessels. Included are the basic functions, scientific principles and symbols. Students will identify components on typical Process Flow Diagrams and Process and Instrument Diagrams. Restricted to: Instrumentation and Control Technology majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Explain the different pieces of equipment used in moving fluids through a process plant such as piping, valves, pumps, compressors, motors, engines, turbines, and power transmission devices. Explain the purpose of each component. Understand the applications for the different types of equipment in each classification and their operating principles.
2. Explain the different types of heat exchangers and cooling towers used in the Process Industry as well as their components. Describe their operating principles and the operator's role in their operation.
3. Explain the different types of boilers and furnaces as well as their components. Describe their operating principles and the operator's role in their operation.
4. Explain the function of filters and dryers along with their principles of operation and the operator's role in their operation.
5. Explain the different types of vessels used in the process industry and well as their components and auxiliary systems. Define what happens internally in the different vessels.
6. Demonstrate reading Process Flow Diagrams and Piping and Instrumentation Diagrams.
7. Apply terms used when describing the various pieces of equipment

INST 165. Equipment Processes**4 Credits (4)**

This course introduces Thermal Energy and Mechanical alignment in equipment and machinery components. Students will learn the operation, maintenance, and troubleshooting of these types of equipment. Consent of Instructor required. Restricted to: Instrumentation and Control majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Explain how Thermal Process System works.
2. Identify parts of Thermal System and Steam machines.
3. Identify troubleshooting of thermal machine.
4. Explain the steps of how to operate the Thermal Systems

INST 205. Programmable Logic Controllers and Applications
4 Credits (4)

This learning system is set up in a self-directed format where students can proceed forward at their own pace. The directions are provided in a series of Learning Activity Packets (LAPs), which include text and lab activity directions. LAPs book will be handed out at the start of every class day and must be returned before the class day begins. This learning system can be used as a stand-alone teaching learning system within any class to give hands-on experience in electrical systems. Computer Literacy and internet literacy is required to enroll in this course. Restricted to: Instrumentation and Control Technology majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Explain the basics of PLCs.
2. Describe how PLCs are used in industrial environments.
3. Demonstrate ability to program a PLC unit to solve a problem

INST 251. Instrumentation and Measurement
5 Credits (5)

The overall aim of this course is to present the students with the basic principles and techniques required for the design and analysis of measurement systems. The course introduces the theory of measurement as well as the sensors and instruments typically used for measuring various physical quantities. Restricted to: Instrumentation and Control Technology majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Understand measurement principles and apply them within measurement systems
2. Select and specify suitable instrumentation for measurement of physical quantities
3. Analyze and interpret experimental data
4. Perform analog and digital signal processing
5. Identify various sensor technologies and their use in measurement systems

INTR-INTERDISCIPLINARY STUDIES

INTR 300. Foundations of Interdisciplinary Studies
3 Credits (3)

Introduction to Bachelor of Individualized Studies (BIS) and Bachelor of Applied Studies (BAS) degree programs. Explores roles of interdisciplinary studies in contemporary world and how emerging and perennial problems and issues can be comprehended utilizing multiple theoretical and analytic methods. Students design or update their course of study for earning the BIS or BAS degree. Consent of Instructor required. Restricted to Las Cruces campus only.

INTR 301. Interdisciplinary Research: Theory & Practice
3 Credits (3)

Focuses on knowledge gained through interdisciplinary research. Students develop comprehensive understanding of steps of systematic inquiry into interdisciplinary research questions. Includes active learning through design and implementation of an interdisciplinary research project. For BIS and BAS majors only. Consent of Instructor required.

JAPN-JAPANESE

JAPN 1110. Japanese I
4 Credits (4)

This course focuses on the basics of the Japanese language with a balanced approach to the development of four skills: listening, speaking, reading and writing. The course is designed to teach students to communicate with Japanese socially and to utilize culturally appropriate manners to engage in Japanese daily life. While conversational skills are emphasized, the student will also be introduced to the various Japanese scripts.

Learning Outcomes

1. Become introduced to the sound system of the Japanese language.
2. Gain a basic understanding of Japanese scripts.
3. Learn and utilize vocabulary needed for basic conversation.
4. Converse and write on topics related to immediate personal needs, greetings, introductions, personal data, daily routines and school.
5. Comprehend both artificial and authentic written and aural texts of short length on familiar topics.
6. Comprehend and use essential grammar concepts.
7. Identify patterns of cultural behavior or customs in Japan, including gestures, greetings, and body language.
8. Gain the ability to converse using Japanese idiomatic expressions.

JAPN 1120. Japanese II
4 Credits (4)

This course focuses on building upon the basics of the Japanese language with a balanced approach to the development of four skills: listening, speaking, reading and writing. The course is designed to teach students to communicate with Japanese socially and to utilize culturally appropriate manners to engage in Japanese daily life. Along with further developing conversational skills, the student will also continue to learn about and utilize various Japanese scripts.

Prerequisite: grade of C or better in JPNS 1110 or consent of instructor.

Learning Outcomes

1. Understand and utilize in more depth the sound system of the Japanese language.
2. Gain a greater understanding of Japanese scripts.
3. Utilize expanded vocabulary in conversation.
4. Converse and write on topics related to personal, social, geographical, and political life.
5. Comprehend both artificial and authentic written and aural texts of longer, but still brief length, such as personal letters, messages, journals, and narrative accounts.
6. Comprehend and use essential and more complex grammatical concepts.
7. Continue to develop a sense of culturally appropriate conduct.
8. Build upon the ability to converse using Japanese idiomatic expressions.

JAPN 2110. Japanese III**3 Credits (3)**

This course is designed for students who have completed 12 credit hours or the equivalent of Japanese study. This course continues to expand vocabulary, grammar and 209 Kanji to deal with daily activities. Its objective is to teach students to communicate in a meaningful way using all four language skills: speaking, listening comprehension, reading and writing. Students will be able to manage not-complicated daily situation. Students will attain ACTFL intermediate-low level in four skills.

Prerequisite: grade of C or better in JPNS 1120 or consent of instructor.

Learning Outcomes

1. Participate in conversations on familiar topics, such as applying part-time job, gift giving/receiving, planning a trip, lost and found, using sentences and short series of sentences.
2. Handle short social interactions in everyday situations by asking and answering a variety of questions.
3. Usually say what they want to say about themselves and their everyday life.
4. Write on a variety of familiar topics in Japanese characters using connected sentences.
5. Understand the main idea in messages and presentations in Japanese on a variety of topics related to everyday life and personal interests and studies.
6. Sometimes understand the main idea of conversations that they overhear.
7. Understand the main idea of texts in Japanese characters related to everyday life and personal interests or studies.
8. Describe and make comparisons between cultures about beliefs, behaviors and cultural artifacts in Japan.

JAPN 2120. Japanese IV**3 Credits (3)**

This course is designed for students who have completed 15 credit hours or the equivalent of Japanese study. This course continues to expand vocabulary, grammar and 271 Kanji to deal with not-complicated daily situation with ease. Also students acquire a competence for Japanese pragmatic usage. This course follows ACTFL language guidelines, integrating the five C's: communication, cultures, connections, comparisons and communities, to offer the student a well- rounded classroom experience. Students will attain ACTFL intermediate-mid level in four skills.

Prerequisite: grade of C or better in JPNS 2110 or consent of instructor.

Learning Outcomes

1. Participate with ease and confidence in conversations on familiar topics, such as relationships, part-time job, shopping with a variety of request, meeting socially superiors.
2. Usually describe people, places, and things, and talk about events and experiences in various time frames.
3. Handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
4. Write about topics related to school, work, and community in a generally organized way in Japanese characters.
5. Write some simple paragraphs in Japanese characters about events and experiences in various time frames.
6. Easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
7. Usually understand a few details of what they overhear in conversations, even when something unexpected is expressed.
8. Sometimes follow what they hear about events and experiences in various time frames.
9. Understand the main idea of texts in Japanese characters with topics related to everyday life, personal interests, and studies, as well as sometimes follow stories and descriptions about events and experiences in various time frames. 1
10. Describe and make comparisons between cultures about beliefs, behaviors and cultural artifact in Japan. 1
11. Start using languages in a culturally appropriate way based on the understanding of cultural similarities and differences, including the use of "honorific" and "humble" expression.

JAPN 320. Oral Practicum in Japanese**1-3 Credits**

Service training for facilitators leading informal conversation groups in Japanese. May be repeated up to 4 credits.

Prerequisite: fluency in Japanese and consent of instructor.

JAPN 453. Independent Studies in Japanese**1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students. May be repeated up to 6 credits.

JOUR-JOURNALISM

JOUR 105G. Media and Society**3 Credits (3)**

Functions and organization of the mass media system in the United States; power of the mass media to affect knowledge, opinions, and social values; and the impact of new technologies.

JOUR 110. Media Writing I**3 Credits (2+2P)**

Introduction to media writing basics including news writing for print and web, feature writing, sports writing and writing for public relations. Course emphasizes fundamental news values, journalism ethics and Associated Press style. Restricted to all Campuses. May be repeated up to 3 credits.

Learning Outcomes

1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews, attributions and cutlines.
2. Know how to cover scheduled and breaking news events, and put knowledge into practice.
3. Know how to write for different media, including print, web and broadcast, and put knowledge into practice.
4. Know fundamentals of writing news stories, features, editorials, obituaries, and press releases, and put knowledge of each into practice.
5. Develop and practice basic copy editing skills.

JOUR 201. Introduction to Multimedia Journalism**3 Credits (2+2P)**

Introduction to journalistic storytelling using text, photos, audio, video and infographics. Students produce their own multimedia stories in intensive, hands-on environment using digital cameras and audio recorders, mobile phones, external microphones and digital editing software applications including Adobe Premiere Pro, Audition and Photoshop. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how to recognize and accurately define multimedia journalism.
2. Improve visual literacy by viewing and analyzing a variety of work produced by professional multimedia journalists.
3. Know the basic requirements and parts of a story, and know how to map and structure a story.
4. Know and put into practice news writing basics including the five W's.
5. Know what makes a good image, and put into practice composing and framing photographs and videos.
6. Understand and put into practice still photography, video and audio capture and editing fundamentals using a variety of tools.
7. Know how to combine different media to create a logical and effective story.

JOUR 210. Copyediting**3 Credits (2+2P)**

Introduction to various aspects of copyediting with an emphasis on accuracy and style. Includes hands-on, directed practice in editing for Associated Press style, punctuation and grammar. Includes headline and outline writing. May be repeated up to 3 credits.

Prerequisite: JOUR 110.

Learning Outcomes

1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews and attributions.
2. Know fundamentals of writing news stories, sports stories, features and editorials, and put knowledge of each into practice.
3. Know how to write for different media, including print, web and social media, and put knowledge into practice.
4. Develop and practice basic copy editing skills.
5. Understand fundamentals of media law and ethics, and know basic press rights.
6. Understand basic math principles used by reporters.
7. Practice and understand the importance of meeting deadlines.
8. Develop a habit of consuming news and monitoring daily headlines.

JOUR 300. Introduction to Advertising**3 Credits (3)**

Role of IMC (integrated marketing communications) in marketing of goods, services, and organizations. Creative process, strategic planning media, message design, consumer behavior, and social issues of IMC.

JOUR 302. Television Videography & Editing**3 Credits (3)**

Classroom instruction on basic studio and single camera video productions. The focus is placed on introductory practical aspects of news and videography, reporting and storytelling. Lab experience in camera basics, studio functions and digital video editing. Includes practical experience through crew assignments on the live student-produced newscast, News22, which airs on KRWG-TV, a PBS affiliate station. May be repeated up to 3 credits.

Learning Outcomes

1. The students will be able to have a broader introductory understanding of video production for broadcasting media
2. The students will be able to edit video and digital production
3. The students will be able to create media reporting for News and Sports

JOUR 305. Visual Communication in Media**3 Credits (3)**

How one sees, perceives, interprets, creates and applies visual language. Explores the history, techniques, application and practice of the various visual media. May be repeated up to 3 credits.

Learning Outcomes

1. Give students an understanding of the historical, critical, theoretical and practical aspects of visual culture in digital media era.
2. Sharpen students' visual acuity
3. Enhance students' understanding of point of view
4. Help students to broaden their perspective of visual communication from the storytelling perspective in social and digital media
5. Enlarge students appreciation of visual culture

JOUR 306. Sports Writing and Reporting**3 Credits (3)**

Fundamental principles of sports writing and reporting with an emphasis on accuracy and style. Includes a mix of classroom instruction and hands-on, directed practice in game coverage sports feature writing, sports commentary and sports statistics. Students have the opportunity to produce sports content for Kokopelli online news outlet. May be repeated up to 6 credits.

Prerequisite: JOUR 210 or consent of instructor.

Learning Outcomes

1. Know how to recognize and accurately define sports journalism and different sports story types
2. Improve sports journalism literacy by reading, viewing and analyzing a variety of work produced by professional sports writers and reporters
3. Know the basic parts of a sports story, and know how to structure and package various types of sports stories
4. Know and put into practice sports writing basics including the five W's, leads, interviews, quotations and attributions
5. Know how to write sports stories for different media, including print, web and social media, and put knowledge into practice
6. Know basic sports terminology, and know how to compile, compute and interpret a wide variety of sports statistics

JOUR 310. Media Writing II**3 Credits (3)**

Field reporting and writing for web and print publication. Includes a mix of classroom instruction and hands-on, directed practice in local news and sports reporting, feature writing, opinion writing and social media content creation. Students produce written and visual content for Kokopelli online news outlet. Course emphasizes accuracy, news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits. May be repeated up to 3 credits.

Prerequisite: JOUR 210.

Learning Outcomes

1. Write an inverted pyramid on deadline.
2. Use AP style in all written assignments.
3. Incorporate news writing conventions in all stories.
4. Identify the differences between hard news stories and features.
5. Conduct interviews using best journalistic practices and professionalism.
6. Demonstrate news judgment in pitching, reporting, and writing stories.
7. Build a personal website and use digital media to report, publish and promote stories.
8. Understand basic libel law and journalistic ethics.

JOUR 312. Advertising/Copywriting**3 Credits (3)**

Creative process, strategic thinking, and principles of advertising in execution of copy, storyboards, and layouts for clients.

Prerequisite(s): JOUR 110 or consent.

JOUR 314. Broadcast Reporting**3 Credits (3)**

Students learn the techniques of reporting and writing news stories for broadcast, including how to incorporate video and natural sound so all elements work together for good storytelling. May be repeated up to 3 credits.

Prerequisite: JOUR 302.

Learning Outcomes

1. Students will learn the basics of television reporting.
2. Students will learn and practice the skills of broadcast news reporting, especially, broadcast writing, reporting, interviewing, videography and audio recording, editing, and how to tell stories with video and audio.

JOUR 315. News 22**1-3 Credits (1-3)**

Students will report news stories for live, student-produced television newscast that airs on KRWG-TV, public television for Southern New Mexico. May be repeated up to 3 credits.

Prerequisite: JOUR 314 or JOUR 330.

Learning Outcomes

1. Students will learn to report professional news stories for News twenty-two
2. Students will learn the fundamentals of live broadcast news production.

JOUR 319. Intro Photography**3 Credits (3)**

Introduction to photography emphasizing composition, camera techniques, post-production skills in Photoshop, Lightroom, and InDesign and storytelling skills. History of photography overview. This class is the starting point for students interested in a photojournalism emphasis. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to use "visual language" for use across multiple platforms including print, video and web.
2. Students will acquire post-production skills used in various industries.
3. Students will be able to produce powerful and effective communication through image-making.

JOUR 320. Photojournalism**3 Credits (3)**

Communication photography on multiple platforms for sports, news, advertising/public relations and other editorial and commercial needs. Photography lighting techniques, photo-editing software, and website skills will be expanded and further developed. May be repeated up to 3 credits.

Prerequisite: JOUR 319 or Consent of instructor.

Learning Outcomes

1. Students will be able to use specialty techniques, especially sports photography and studio/portraiture/product photography.
2. Students will expand skills needed in editorial, advertising and other communication industries.

JOUR 321. Media Graphic Design**3 Credits (3)**

Introduction to graphic design fundamentals for print and web publication including page layout, typography, color theory and photo editing. Students produce their own print and web-based design pieces using Adobe InDesign and Photoshop. May be repeated up to 3 credits.

Learning Outcomes

1. Know and put into practice fundamental design principles including proximity, alignment, repetition and contrast.
2. Know fundamentals of color theory and typography, and apply this knowledge to a variety of media design projects.
3. Know fundamental rules of photography composition and cropping.
4. Know fundamental rules and principles of printed newspaper and magazine design and put knowledge into practice.
5. Know fundamental rules and principles of printed newsletter and brochure design and put knowledge into practice.

JOUR 330. TV News Shooting & Editing**3 Credits (2+4P)**

Advanced technical and aesthetic skills and journalism basics needed for videography and editing on-location news stories. Single camera videography and nonlinear/digital editing. May be repeated up to 3 credits.

Prerequisite: JOUR 314 or permission of instructor.

Learning Outcomes

1. Learn or continue exploring and mastering the concept of video sequencing in the field, gathering great natural sound, opening and closing shots and improve your overall storytelling process in the field and during the edit process.
2. Learn or continue exploring the fundamentals of non-linear digital editing, using Adobe Premier.
3. Expand knowledge of field sound recording.
4. Learn and distinguish the difference between uncontrolled action and controlled action.

JOUR 350V. Media History**3 Credits (3)**

Historical overview of media including newspapers, magazines, radio, television, photography, entertainment media, advertising, public relations, and digital media. The history of American media development is directly intertwined with American history. Newspapers, magazines, television, and radio have not just reported on news and events; by virtue of what facts and sources editors and reporters have chosen to use, journalists have framed how the public should think about events. Editorials also provided further framing guidance on issues to readers and viewers. Students will study media history from social, intellectual, and cultural history perspectives. Students will examine the historical relationship of the media to American social, political, economic, and cultural patterns and developments. And, conversely, students will examine how these same forces impacted and changed all forms of media through a multi-cultural approach. May be repeated up to 3 credits.

Learning Outcomes

1. Survey the development of various forms of media and the changes in the media as they relate to the larger social, economic, and political sphere
2. Learn the methods and processes of historical research and engage in historical research.
3. Learn that the development of all fields of communication are interrelated
4. Discover how American media have attempted to influence how Americans perceive the world around them (including perceptions of other nations) via their coverage and portrayal of global events.
5. Learn that America's historical events played out through the media. As such, students will gain a deeper understanding of how media personnel helped "frame" the discussion and debate about news and information from the 1600s to present day
6. Discover that the ethical and professional foundations of media industries have adjusted and changed over time due to external and internal forces, including the rise of the professionalism movement across the nation in the late nineteenth century, the internal response to public demands for licensing of news media following World War I, and modern pressures caused by digitization of the industry and the parallel fragmentation of audiences
7. Learn how to determine how various groups outside the mainstream contributed to overall press development. This includes an examination of how women and ethnic minorities influenced how and why the press became a force for social, cultural, political, and economic change in society.
8. Discover and appreciate that history is NOT just the study of names, dates, and places, but of people
9. Discover that the history of media is not the province of any one individual, corporation, or entity. Instead, a variety of factors: social, economic, political, legal, ethical, and cultural, helped shape the media's development

JOUR 360. Media Literacy**3 Credits (3)**

This course is designed to help students develop an informed, critical, and practical understanding of media including analysis of online and social media and to help students develop their media literacy and analytical skills.

Learning Outcomes

1. Write clearly, precisely, and in a well-organized manner.
2. Demonstrate critical thinking, reading, and viewing skills.
3. Research, develop, evaluate, and present arguments grounded in research-based knowledge.
4. Apply analytical, precise, and elaborated terms and concepts for talking and writing about media and the ways in which they communicate meaning.
5. Demonstrate how images are constructed via specific formal and technical elements and how those images construct meaning about national and global communities.
6. Interpret media texts (film, television, etc.) to expand experience and understanding of the self and society.

JOUR 374. Introduction to Public Relations**3 Credits (3)**

This course is designed to familiarize students with the basic concepts, principles, practices, and professions of public relations (PR). It is the foundation course for other PR courses in Journalism and a supplemental course for students majoring in other fields.

Learning Outcomes

1. The role and functions of public relations in contemporary society.
2. The contingency views of public relations practice in the worlds of managing competition and conflict.
3. The historical evolution of public relations, career opportunities in the field, and professional/ethical/legal responsibilities.
4. The basic process of public relations—research, planning, communication, evaluation—and the use of communications strategies and tactics to achieve organizational goals and objectives.
5. The persuasion of public opinion and audience analyses and how to reach diverse audiences.
6. Practical guidelines for utilizing written, spoken, and visual techniques to reach selected audiences.
7. An understanding of how public relations is a global phenomenon.
8. How the Internet and social media are changing the way public relations professionals build and sustain relationships between an organization and its constituents.
9. An understanding of public relations activities in business, sports, tourism, entertainment, nonprofit, education, and government organizations.

JOUR 377V. Mass Media Ethics**3 Credits (3)**

Philosophical and moral examination of problems relating to mass media. Use of case study method to analyze media situations; development of framework for media professionalism.

JOUR 380. Women and the Media**3 Credits (3)**

Portrayal and participation of women in mass media from colonial to contemporary times. Same as GNDR 450. May be repeated up to 3 credits.

JOUR 384. Public Relations Storytelling**3 Credits (3)**

This course will help students understand the concept of using storytelling as a tool for public relations, branding, and social change. Students will learn how to use storytelling on traditional and social media platforms. Upon completion of this course, students should have attained knowledge of essential elements of storytelling, audience-led narratives, transmedia storytelling, etc.

Learning Outcomes

1. Students will attain knowledge and understanding of the essential elements of branding through storytelling.
2. Students will attain knowledge and understanding of the assessment of brand stories and customer-led narratives.
3. Students will attain knowledge and understanding of integrating brand storytelling into the marketing mix.
4. Students will attain knowledge and understanding of data-driven storytelling.
5. Students will attain knowledge and understanding of personal branding of leaders and brand storytelling success.
6. Students will attain knowledge and understanding of research skills for brand storytelling.
7. Students will attain knowledge and understanding of the future of brand storytelling.

JOUR 407. Media Internship**1-3 Credits (1-3)**

Supervised work with a media organization. 1-3 credits. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: JOUR majors.

Prerequisite(s): Consent of internship coordinator.

JOUR 408. Media Practicum**1-3 Credits**

Advanced supervised work with a media organization. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Consent of internship coordinator.

JOUR 412. Documentary Photojournalism**3 Credits (3)**

Production of documentary photography for web, print, broadcasting and exhibition emphasizing deep visual storytelling. Multimedia, social media distribution and website techniques including WordPress website design and maintenance. Discussion of notable photographers. Multiple Field Trips to produce material for the Small Village New Mexico term project (SVNM). Students produce an individual Term Project book and multimedia show. May be repeated up to 3 credits.

Prerequisite: JOUR 319.

Learning Outcomes

1. Students will learn "slow photojournalism," and be able to produce visual stories done with deep immersion in whatever community or subject they work in.
2. Students will be able to use photography for communication, giving deeper meaning to subjects than transitory "news" type photography allows.

JOUR 414. Broadcast Reporting Portfolio**3 Credits (3)**

This course is designed to help students who are preparing for a career in broadcasting. Students will refine reporting, shooting and editing skills and build a professional website containing a reporter reel, resume and proof of other skills needed for success in broadcasting. The class also features guest speakers throughout the semester who work in the broadcast and digital world of media. May be repeated up to 3 credits.

Prerequisite: JOUR 314.

Learning Outcomes

1. To practice, hone, and improve scriptwriting skills, especially news writing.
2. To practice and improve audio announcing skills and on-camera announcing skills.
3. To practice and improve overall videography and digital editing skills.
4. To learn more and prepare for related careers.

JOUR 425. Media Planning and Buying**3 Credits (3)**

Covers the principles of media planning for an IMC campaign and procedures for purchasing ad time or space.

Prerequisite(s): JOUR 300 or consent of instructor.

JOUR 427. Media Writing III**3 Credits (3)**

Advanced field reporting and writing for web and print publication. Includes hands-on, directed practice in local news and sports reporting, feature writing, opinion writing, social media content creation and web publishing. Students produce written and visual content for Kokopelli online news outlet, and prepare final portfolio. Course emphasizes accuracy news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits.

Prerequisite: JOUR 310.

Learning Outcomes

1. Sharpen and expand advanced reporting, interviewing, writing, and editing skills for print and online publication.
2. Sharpen multimedia reporting and storytelling skills including photography skills.
3. Improve and expand professional portfolio through online publication of original work.
4. Demonstrate effective use of social media platforms.
5. Demonstrate understanding of fundamentals of journalism ethics.
6. Learn to work effectively under deadline pressure.
7. Produce a final portfolio or "string book" of published work.

JOUR 457. Social Media Management and Analytics**3 Credits (3)**

This course is designed to help students to understand how marketing has (and has not) changed due to the rise of social media and changes in various underlying contextual factors, such as dramatically increased speed of information dissemination across consumers and brands. The overarching goal is to obtain a clear perspective on what's really going on in digital/social/mobile marketing so that you can begin to appreciate its true value to consumers, to managers, and to other corporate stakeholders. It will equip students with the relevant knowledge, perspectives, and practical skills required to develop marketing strategies that leverage the opportunities inherent in social media and consumer-to-consumer social interactions for achieving business and marketing goals.

Prerequisite: JOUR 374.

Learning Outcomes

1. Understand what social media is and how this new type of media and communications technology influences how business and marketing is done
2. Develop skill in using the predominant social media tools currently available for business/marketing communication
3. Understand how to use various social media channels to publish and disseminate relevant branded content in order to engage consumers and to increase social impact, influence, and value
4. Develop a strategic plan for identifying opportunities for using social media in a company

JOUR 460V. Sports & Entertainment P.R.**3 Credits (3)**

This course aims to provide a basic understanding of sports and entertainment PR and its industry trends, theories, techniques, case studies, global trends, and future directions. Upon completion of this course, students will be able to use the theories and techniques to plan, implement, and evaluate sports and entertainment PR campaigns and activities. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the nature of public relations practice in sports
2. Practice the primary research methods employed in sports public relations.
3. Recognize the major steps involved in planning a public relations campaign and the key considerations at each step in the process.
4. Identify the various types of paid/earned/shared/owned media commonly utilized in the profession
5. Comprehend the different tactics used to generate publicity.
6. Become proficient in writing news releases.
7. Distinguish among the various response strategies sports managers may employ in a crisis.
8. Describe unique aspects of social responsibility in the sports and entertainment industry
9. Identify legal issues in sports PR, anticipate emerging ethical issues, evaluate ethical dilemmas present in sports PR, and recognize the need for ethical decision-making in sports PR. 1
10. Describe current global trends and multicultural issues, which have impacted the global sports and entertainment industry.

JOUR 463. Public Relations for Social Impact**3 Credits (3)**

This course aims to provide a basic understanding of the role of PR in influencing public behavior and creating positive social impact. This course offers different approaches to solving a range of social problems in the areas of health, safety, environmental protection, and community involvement.

Learning Outcomes

1. Apply social marketing theories for developing, implementing, and evaluating social marketing campaigns
2. Utilize nudge techniques to improve decisions about health, wealth, and happiness in both personal and societal levels
3. Prepare a prosocial campaign plan using social media and public relations strategies
4. Identify examples of successful social marketing campaigns

JOUR 470. Environmental, Social, & Governance Public Relations**3 Credits (3)**

This course will explore how organizations create values by investigating the concept of environmental, social, and governance (ESG) and social responsibility campaigns in the light of public relations. Students will learn about philanthropy, sustainability, reputation building, and ESG for the media and entertainment industry.

Learning Outcomes

1. Understand the basic concepts and elements of Strategic Corporate Social Responsibility (Strategic CSR).
2. Understand company's value-creating activities through strategic CSR.
3. Understand company's CSR strategy under the context of economical and social exchanges
4. Understand the process of creating comprehensive strategic CSR communications plan

JOUR 476. Advertising & Public Relations Campaigns**3 Credits (3)**

In this capstone course, students will utilize the principles and techniques of advertising and public relations to research and develop a comprehensive campaign plan. Students will develop a portfolio to demonstrate their skills to prospective employers. Restricted to Journalism and Media Studies Majors. May be repeated up to 3 credits.

Prerequisite: JOUR 374.

Learning Outcomes

1. Students will independently work on two projects to practice how to promote themselves and develop a professional point of view.
2. Students will create a portfolio at the end of the course that can be used to help demonstrate their skills to prospective employers.
3. Students' projects will demonstrate that they understand how to utilize the principles and techniques of advertising and PR to research and develop a comprehensive campaign plan.

JOUR 489. Media Research**3 Credits (3)**

Examination of the role of empirical research in solving mass communication problems. Survey techniques, field studies, content analysis, data analysis. May be repeated up to 3 credits.

JOUR 490. IMC Campaign**3 Credits (3)**

Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local IMC (Integrated Marketing Communications) campaign. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): JOUR 300 and 312 or consent of instructor.

Learning Outcomes

1. Students will learn how to create IMC campaign for client or for brands, and will be able to apply this for the real world when they apply for job.

JOUR 493. Media Law**3 Credits (3)**

Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, POLS 493. May be repeated up to 3 credits.

JOUR 494. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes.

JOUR 495. Media Theory**3 Credits (3)**

Theoretical approaches to media communications. Examination of media effects, audiences, and media socialization. May be repeated up to 3 credits.

JOUR 499. Independent Study in Media**1-3 Credits**

Individual study directed by consenting instructor with prior approval of department head. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s): 2.5 GPA and consent of instructor.

JOUR 501. Global Strategic Communications: Cultural Perspective**3 Credits (3)**

This course is set up to combine both theory and practice, regarding global communications, especially from cultural perspectives. Also, this course is designed for students to understand persuasive strategic communications in different nations. Markets are no longer bound with their physical locations because of the communication technologies. To successfully address the strategic communications in global market, marketers and advertisers need to fully understand "local" challenges coming "deep" from cultural, economic, regulatory and competitive differences. Based on theoretical and practical understanding of the dynamic interplay between global and local forces, students will acquire theoretical as well as practical understandings of how to accomplish the goals of strategic communications in global markets. Thus, the core objective of this class is to develop an ability to analyze and map out persuasive communication strategies that are effective in global markets.

Learning Outcomes

1. Know how to analyze cultural norms and recognize strategic communications practices that are congruent to such cultural norms.
2. Identify similarities and differences in different consumer segments according to dimensions of culture.
3. Develop a deeper understanding of cultural dimensions.
4. Implement effective market research applications in different regions of the world.
5. Conceptualize and operationalize theoretical frameworks.

L SC-LIBRARY SCIENCE

L SC 100. Introduction to Libraries

3 Credits (3)

Overview of libraries, including history and development, responsibilities of library personnel, types of libraries and services, and technology and trends. Restricted to Dona Ana campus only.

L SC 110. Reference and Information Resources I

3 Credits (3)

Overview of reference services. Introduction to, and evaluation of, basic types of information resources (both print and electronic) and their application in libraries.

L SC 111. Introduction to Information Literacy in an Electronic Environment

3 Credits (3)

Introduction to the basics of the research process; the organization, location and evaluation of information using print, non-print and electronic resources. Restricted to: Community Colleges only.

L SC 120. Cataloging Basics I: Descriptive Cataloging

3 Credits (3)

Introduction to descriptive cataloging. Restricted to: Dona Ana campus only.

L SC 130. Introduction to Technical Services in Libraries

3 Credits (3)

Introduction to technical services in libraries, including acquisitions, bindery, cataloging, gifts, and serials. Restricted to Dona Ana campus only.

L SC 140. Multimedia Materials and Presentations in Libraries

3 Credits (3)

Overview of media formats and equipment. Introduction to desktop publishing, presentations, and web-page creation applications in libraries. Restricted to: Community Colleges only.

L SC 160. Introduction to Public Services in Libraries

3 Credits (3)

Introduction to public services in libraries, including circulation, inter-library loan, reference, media services, special collections, and government documents. Restricted to Dona Ana campus only.

L SC 200. Collection Management and Development in Libraries

3 Credits (3)

Principles of identifying, selecting, acquiring, managing, and evaluating resources for libraries. Restricted to Dona Ana campus only.

L SC 203. School Library Media Specialist

3 Credits (3)

Principles and practice of managing the school library media center, with an emphasis on its specific educational mission. Topics may include collection development, classes and lesson plans, public relations, administrative procedures, and use of technology. Restricted to Dona Ana campus only.

L SC 210. Technology Planning in Libraries

3 Credits (3)

Overview of computer applications in libraries. Topics may include automated systems and electronic resources, introduction to evaluation of technology, and writing a technology plan. Restricted to Dona Ana campus only.

L SC 221. Experiential Learning I

1-3 Credits

Student is employed (paid or non-paid) in an approved work site and evaluated by their supervisor. Each credit requires a specified number of hours of on-the job work experience. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Dona Ana campus only. **Prerequisite(s):** Consent of instructor.

L SC 230. Issues and Ethics in Libraries

3 Credits (3)

Discussions of current and continuing challenges to effective library service. Topics may include copyright, censorship, intellectual freedom, Internet filtering, problem patrons, security, or other current issues. Restricted to Dona Ana campus only.

L SC 240. Internet Resources and Research Strategies

3 Credits (3)

Introduction to retrieving and evaluating information found on the Internet and in selected Internet-accessible databases. Restricted to: Dona Ana campus only.

L SC 255. Special Topics

1-3 Credits

Special topics to be announced in Schedule of Classes. May be repeated for a maximum of 12 credits. Restricted to: Dona Ana campus only.

L SC 270. Library Science Capstone

3 Credits (3)

A culmination of all technical courses that are required to receive an Associate of Applied Science from the program centering around the completion of a library related project. Discussions on the role of paraprofessionals in libraries. Restricted to: Dona Ana campus only.

L SC 298. Independent Study

1-3 Credits

Individual studies directed by consenting faculty with prior approval of department chair. May be repeated for a maximum of 12 credits. Restricted to: Dona Ana campus only.

LANG-LANGUAGE

LANG 111. Beginning Language I

4 Credits (4)

Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.

Prerequisite: Language placement exam or consent of the instructor.

LANG 451. Special Topics

1-3 Credits

Selected topics relating to cultures or literatures of a specific country. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. May be repeated for a maximum of 12 credits. Consent of instructor required.

LANG 453. Independent Studies

1-3 Credits

Individualized, self-paced projects for advanced students. May be repeated under different subtitles for a maximum of 6 credits.

Prerequisite: consent of instructor.

LANG 490. Introduction to Yucatec Maya Language and Culture I
3 Credits (3)

This course provides the student with an introduction to Yucatec Maya language and culture of Yucatan.

Learning Outcomes

1. students will be able to identify who and where Yucatec Maya is spoken, describe the sound system and basic syntax of the language, participate in basic introductory conversations and make connections between the language and culture of Yucatan.

LAWE-LAW ENFORCEMENT

LAWE 180. Public Safety First Line Supervisor
3-6 Credits (3-6)

This course is designed to enhance public safety personnel's human resource management and reduce organizational liability. Consent of Instructor required. Restricted to Community Colleges campuses

Learning Outcomes

1. Describe and explain police administration.
2. Explain and discuss the various leadership and management theories.
3. Define and discuss the various types of leadership skills and management styles.
4. Express and discuss the role of the police administrator and police administration.
5. Explain the leadership required of police administrators for an effective Law Enforcement administration.
6. Describe and interpret the "quality approach to managing community relations"
7. Explain and discuss the necessities of introducing organizational change.
8. Explain and discuss the planning, programming and budgetary process including: variables that affect the decision-making process.
9. Analyze and discuss the role of effective communications in a police organization including negotiations and conflict resolution. 1
10. Explain and analyze the role of human resources in the organization including: their role in the recruitment and selection process; training; performance evaluations; promotions; and assessment centers. K) Discuss the role of police unions and explain their significance in labor relations.

LAWE 201. Introduction to Juvenile Delinquency
3 Credits (3)

An introductory overview of the juvenile justice system of due process, custody, detention and release. Note: course does not meet upper division requirements towards completion of Bachelor of Science in Criminal Justice. Restricted to: Community Colleges Only.

LAWE 202. Police Patrol Procedures
3 Credits (3)

A critical review of police procedures and the influences on police behavior; policy development, including the police role; discretion; police community interaction and arrest, search and seizure. Restricted to: Community Colleges only.

LAWE 203. Introduction to Police Supervision
3 Credits (3)

An introductory overview of police supervision and concerns as it applies to law enforcement. (Note: Course does not meet upper division requirements toward completion of Bachelor of Science in Criminal Justice.) Restricted to: Community Colleges only.

LAWE 204. Introduction to Homeland Security
3 Credits (3)

A historical perspective of international and domestic terrorist threats and the need to develop cohesive response policies and practices in the interest of National Security. [Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice.] Restricted to: Community Colleges only.

Prerequisite(s): CJUS 1110G.

LAWE 205. Practical Field Investigations
4 Credits (3+3P)

Incorporates the current methods and techniques for the management of the crime scene, includes documentation, collection and preservation of evidence and case presentations. [Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice.] Restricted to Community Colleges campuses only.

Prerequisite(s): CJUS 1110G and CJUS 2140.

LAWE 206. Traffic Enforcement and Crash Investigations
3 Credits (3)

History and development of traffic laws and regulations, including basic elements of traffic violations, detection, apprehension, impaired drivers and guidelines and procedures for effective crash investigations and reporting. Restricted to: Community Colleges only.

LAWE 207. Legal Aspects of Law Enforcement
3 Credits (3)

An evaluation of police authority including responsibilities, civil liability, liability implications, legal obligations, legal restraints, laws of arrest, and search and seizure. Retricted to: Community Colleges only.

LAWE 221. Law Enforcement Internship
3 Credits (3)

Application of knowledge, skills and abilities, in an agency as an intern and integrated member of a law enforcement affiliated agency.

Prerequisite: consent of instructor.

LAWE 233. Practical Approach to Terrorism
3 Credits (3)

Gives responders an overall safety approach in recognizing and responding to incidents involving terrorism. Presents and overview in types of harm, explosive weapons, chemical weapons, biological weapons and radiological weapons. [Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice.] Restricted to: Dona Ana campus only. Crosslisted with: FIRE 233

LAWE 255. Special Topics**1-3 Credits (1-3)**

Introductory special topics of lower division level work that provides a variety of timely subjects and content material. Specific subjects to be announced in the Schedule of Classes. A passing grade of C- or better is required. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses

Learning Outcomes

1. Obtaining foundational skills in the administration of justice by differentiating the role of police and corrections in contemporary America.
2. Competence in the legal elements of constitutional, criminal, and substantive law, rules of evidence, search and seizure, and the role of the courts in the adjudication of the law in America.
3. Ability to identify, analyze, and synthesize knowledge from discipline-specific courses in criminalistics, legal aspects, homeland security, terrorism, and patrol operations to effectively conduct a practical field investigation and traffic crash investigation.
4. Ability to develop a criminal justice ethical perspective consistent with 21st century America to, effectively and ethically, perform a criminal justice role in law enforcement or corrections.
5. Basic crime scene management, crime scene note-taking techniques, collection of evidence, and case presentations.
6. An application of knowledge, skills, and abilities, as an intern or integrated member of a criminal justice affiliated agency.

LAWE 298. Independent Study**3 Credits (3)**

Individual studies directed by the consenting faculty with prior approval of the department chair. A passing grade of C- or better is required. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses

Prerequisite(s): Sophomore standing with a 3.0 or better GPA.

Learning Outcomes

1. Obtaining foundational skills in the administration of justice by differentiating the role of police and corrections in contemporary America.
2. Competence in the legal elements of constitutional, criminal, and substantive law, rules of evidence, search and seizure, and the role of the courts in the adjudication of the law in America.
3. Ability to identify, analyze, and synthesize knowledge from discipline-specific courses in criminalistics, legal aspects, homeland security, terrorism, and patrol operations to effectively conduct a practical field investigation and traffic crash investigation.
4. Ability to develop a criminal justice ethical perspective consistent with 21 st century America to, effectively and ethically, perform a criminal justice role in law enforcement or corrections.
5. Basic crime scene management, crime scene note-taking techniques, collection of evidence, and case presentations.
6. An application of knowledge, skills, and abilities, as an intern or integrated member of a criminal justice affiliated agency.
7. Effective communication, orally and in writing, using appropriate references and technologies.
8. Analytical and critical thinking skills when solving complex issues in criminology and the criminal justice system.
9. Competence using and applying appropriate criminological theories on crime causation. 1
10. Competence in understanding and describing how gender, race, ethnicity, age, social class, and sexuality contribute to differing experiences in the criminal justice system. 1
11. Competence in understanding how the inter-dependence of the major components of the criminal justice system (i.e., police, courts, correctional agencies) affect victims, offenders, justice professionals, and society. 1
12. Competence in understanding and applying the fundamental elements of both criminal and constitutional law. 1
13. Competence in the legal foundation of criminal justice and the importance of due process.

LIBR-LIBRARY SCIENCE

LIBR 1110. Introduction to Research**1 Credit (1)**

The goal of this course is to provide students with techniques and tools to become better researchers. This course introduces students to the research process, and the organization, location, and evaluation of information.

Learning Outcomes

1. Develop a research plan based on an information need.
2. Find information efficiently and effectively using a variety of search tools.
3. Evaluate the reliability of an information resource.
4. Practice ethical behavior in using information.

LIBR 1111. Introduction to Information Literacy in an Electronic Environment

3 Credits (3)

Introduction to the basics of the research process; the organization, location and evaluation of information using print, non-print and electronic resources; and techniques of effective personal information management in a computerized setting. Uses a combination of active and hands-on learning methods as well as lectures.

Learning Outcomes

1. Develop a discipline-specific research guide based on an established subject area.
2. Select appropriate information sources and use them to find information efficiently.
3. Evaluate information and its sources.
4. Practice ethical behavior in using information.

LIBR 311V. Information Literacy

3 Credits (3)

Lecture, hands-on assignments, and written research projects to give students the technological skills and critical thinking abilities needed to use the printed and electronic information resources found on the Information Highway. Includes how to locate, critically evaluate, and apply information for academic, professional, and personal purposes.

Prerequisite: ENGL 1110G or equivalent; and consent of instructor.

LING-LINGUISTICS

LING 2110G. Introduction to the Study of Language and Linguistics

3 Credits (3)

This course presents an introduction to the study of language through the basic aspects of linguistic analysis: the sound system (phonetics and phonology), the structure of words and sentences (morphology and syntax), and the ways in which language is used to convey meaning (semantics and pragmatics). In addition, the course will investigate how language is acquired and stored in the brain, and how differences in speech styles and dialects reflect different social and cultural backgrounds of individual speakers.

Learning Outcomes

1. Understand the basic concepts and terminology associated with phonetics, phonology, morphology, syntax, semantics, and pragmatics.
2. Comprehend how language evolves over history and over an individual's lifespan.
3. Describe some common, but mistaken, beliefs about language and to distinguish between descriptive and prescriptive approaches to language.
4. Describe the social, psychological, geographic and historical influences that lead to language dominance or language endangerment.
5. Be aware of the relations among various languages in the world, between dialects and slang, and between human and non-human languages.
6. Apply methods of linguistic analysis as introduced in the course.
7. Critically engage with the works of linguistic researchers.
8. Stimulate curiosity about language and what it reveals about the human mind.

LING 301. Introduction to Psycholinguistics

3 Credits (3)

Psychological aspects of language, including linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as PSYC 301.

LING 302V. Language and Society

3 Credits (3)

Study of how social identity including such factors as ethnicity, age, sex, education, power and socio-economic class is expressed in language systems and how misunderstandings arise between groups. Research skills are emphasized.

LING 303. Exploring Language Systems

3 Credits (3)

Forms of linguistic semantic, syntactic and phonological organization.

Prerequisite(s): LING 2110G.

LING 405. Topics in Linguistics

3 Credits (3)

Selected linguistics topics subtitled in the Schedule of Classes. May be repeated for a maximum of 6 credits under different subtitles.

Prerequisite: consent of instructor.

LING 425. Language and the Mind: Introduction to Psycholinguistics

3 Credits (3)

This course is an introduction to psycholinguistics; the study of how humans learn, represent, comprehend and produce language. Throughout this course, we address a variety of questions on the psychology of language most of which are still being answered. These include: What does it mean to know a language? What are the cognitive processes involved in language use? How do we produce and recognize speech? How can we improve texts and make them easier to read? How can we control speech in special situations to avoid errors?

Prerequisite(s): LING 2110G or consent of instructor.

LING 451. Independent Studies in Linguistics

1-3 Credits

Individual or group study of selected topics to be identified by subtitle. May be repeated for a maximum of 6 credits.

Prerequisites: LING 2110G and prior arrangement with faculty supervisor.

LING 455. Research in Linguistics

3 Credits (3)

This course will provide a capstone experience for students who have progressed through the program in linguistics and provide the foundation for further study at the post-graduate level in a linguistics-related field. Students will apply their foundation of knowledge and skills in linguistics through the realization of an individualized, inquiry-based project. Consent of instructor may enroll student only in case of elective credit shortfall with concurrent enrollment.

Prerequisite(s): LING 2110G, LING 301, LING 302V, LING 303, plus 9 credit hours of related electives.

LING 500. Introduction to Linguistics

3 Credits (3)

Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics and some of the theoretical issues in the field.

LING 502. Graduate Study in Sociolinguistics**3 Credits (3)**

Study of how social identity including factors such as ethnicity, age, gender education and socio-economic class is expressed in language systems.

Prerequisites: LING 2110G or LING 500 recommended.

LING 503. Exploring Language Systems- Grad**3 Credits (3)**

Students will be responsible for all requirements of LING 303 and will undertake independent, directed research.

Prerequisite(s): LING 2110G or LING 500.

LING 505. Selected Topics**3 Credits (3)**

Studies, varying from year to year, in linguistics.

M E-MECHANICAL ENGINEERING

M E 159. Graphical Communication and Design**2 Credits (1+3P)**

Sketching and orthographic projection. Covers detail and assembly working drawings, dimensioning, tolerance specification, and design projects.

Prerequisite(s)/Corequisite(s): MATH 1250G.

M E 210. Electronics and System Engineering**3 Credits (2+3P)**

Introduction to microcontrollers, measurement systems, motion actuators, sensors, electric circuits, and electronic devices and interfacing. Students required to work individually and in teams to design and test simple electromechanical systems. Restricted to Las Cruces campus only. May be repeated up to 3 credits.

Prerequisite: C- or better grade in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to apply knowledge if mathematics, science, and engineering;
2. Ability to design and conduct experiments, as well as to analyze and interpret data;
3. Ability to design a system, component or process to meet desired needs within realistic constraints;
4. Ability to identify, formulate, and solve engineering problems;
5. Ability to use the techniques, skills and modern tools necessary for engineering practice.

M E 222. Introduction to Product Development**3 Credits (2+3P)**

Introduction to modern methods used in the realization of products. Traditional manufacturing processes, such as metal stamping, turning, milling, and casting are reviewed. Modern methods of rapid prototyping and model making are discussed in context of computer-aided design. Techniques for joining metals, plastics, and composites are discussed. Role of quality control is introduced. May be repeated up to 3 credits.

Prerequisite: C- or better grades in ENGR 110.

Learning Outcomes

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

M E 228. Engineering Analysis I**3 Credits (3)**

Introduction to engineering analysis with emphasis on engineering applications. Topics include ordinary differential equations, linear algebra, and vector calculus with focus on analytical methods. May be repeated up to 3 credits.

Prerequisite: C- or better grades in MATH 2530G.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

M E 234. Mechanics-Dynamics**3 Credits (3)**

Kinematics and dynamic behavior of solid bodies utilizing vector methods.

Prerequisite(s)/Corequisite(s): MATH 2530G. **Prerequisite(s):** C E 233.

M E 236. Engineering Mechanics I**3 Credits (3)**

Force systems, resultants, equilibrium, distributed forces, area moments, friction, and kinematics of particles. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): PHYS 1310G. **Prerequisite(s):** MATH 1521G or MATH 1521H.

M E 237. Engineering Mechanics II**3 Credits (3)**

Kinetics of particles, kinematics and kinetics rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies in three dimensions. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 2530G. **Prerequisite(s):** M E 236.

M E 240. Thermodynamics**3 Credits (3)**

First and second laws of thermodynamics, irreversibility and availability, applications to pure substances and ideal gases. May be repeated up to 3 credits.

Prerequisite: C- or better grades in PHYS 1310G.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

M E 261. Mechanical Engineering Problem Solving**3 Credits (2+3P)**

Introduction to programming syntax, logic, and structure. Numerical techniques for root finding, solution of linear and nonlinear systems of equations, integration, differentiation, and solution of ordinary differential equations will be covered. Multi function computer algorithms will be developed to solve engineering problems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to identify, formulate, and solve engineering problems;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

M E 326. Mechanical Design**3 Credits (3)**

Design methodology and practice for mechanical engineers. May be repeated up to 3 credits.

Prerequisite: C- or better in ENGR 234 and C E 301.

Learning Outcomes

1. Ability to design a system, component or process to meet desired needs within realistic constraints;
2. Ability to function on multidisciplinary teams;
3. Understanding of professional and ethical responsibility;
4. Knowledge of contemporary issues.

M E 328. Engineering Analysis II**3 Credits (3)**

Advanced engineering analysis with emphasis on engineering applications. Topics include systems of ordinary differential equations, Fourier analysis, partial differential equations, and functions of complex variable with focus on analytical methods. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 228.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

M E 331. Intermediate Strength of Materials**3 Credits (3)**

Covers stress and strain, theories of failure, curved flexural members, flat plates, pressure vessels, buckling, and composites. May be repeated up to 3 credits.

Prerequisite(s): C E 301 and M E 328.

M E 332. Vibrations**3 Credits (3)**

Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange's equations. Dynamic stability. Controls. Matrix iteration. May be repeated up to 3 credits.

Prerequisite: M E 328, ENGR 234, and M E 261.

Learning Outcomes

1. An ability to analyze free and forced vibrations of a single degree-of-freedom (DOF) to multi-DOF systems; and an ability to perform modal analysis for engineering structures to understand mechanical vibrations in terms of normal modes.

M E 333. Intermediate Dynamics**3 Credits (3)**

Three dimensional kinematics and kinetics, orbital motion, Lagrange's equations, dynamic stability, and controls. May be repeated up to 3 credits.

Prerequisite: M E 328 and ENGR 234.

Learning Outcomes

1. An ability to derive and solve equations of motion for a dynamical system by means of analytical mechanics approach.

M E 338. Fluid Mechanics**3 Credits (3)**

Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations continuity, energy, and momentum to fluid systems. May be repeated up to 3 credits.

Prerequisite: C- or better grade in ENGR 234 and in (M E 228 or MATH 392).

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering;
2. Ability to design and conduct experiments, as well as to analyze and interpret data;
3. Ability to design a system, component or process to meet desired needs within realistic constraints;
4. Ability to identify, formulate, and solve engineering problems.

M E 340. Applied Thermodynamics**3 Credits (3)**

Thermodynamic cycles, Maxwell relations, Gibbs and Helmholtz functions, mixtures, psychometrics, chemical reactions, chemical equilibrium. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 240.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

M E 341. Heat Transfer**3 Credits (3)**

Fundamentals of conduction, convection, and radiation. Design of heat transfer systems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 240 and in (M E 338 or A E 339).

Learning Outcomes

1. Students have the ability to apply knowledge of mathematics, science, and engineering;
2. Students have the ability to identify, formulate, and solve engineering problems.

M E 345. Experimental Methods I**3 Credits (2+3P)**

Emphasis on experimental techniques, basic instrumentation, data acquisition and analysis, and written presentation of results. Includes experiments in dynamics and deformable body mechanics. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 392), in (M E 210 or PHYS 2140), and in ENGR 234.

Prerequisite/Corequisite: C E 301.

Learning Outcomes

1. Ability to design and conduct experiments, as well as to analyze and interpret data;
2. Ability to communicate effectively;
3. Ability to use the techniques, skills and modern tools necessary for engineering practice.

M E 349. MAE Career Seminar**1 Credit (1)**

Seminar course covering topics relevant to mechanical and aerospace engineering juniors (job placement, interviewing techniques, resume preparation, etc.). Restricted to: M E and A E majors.

Prerequisite(s): Junior Standing.

M E 400. Undergraduate Research**1-3 Credits**

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of faculty member.

M E 401. Heating and Air-Conditioning Systems**3 Credits (3)**

HVAC system design including heating and cooling load calculations, psychometrics, piping, duct layout, and system control. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 306.

Prerequisite/Corequisite: E T 396.

Learning Outcomes

1. Master the use of thermodynamics software, EES for this course, and design software, HVAC Calc for this course.
2. Understand the principles of indoor/outdoor psychometrics.
3. Calculate the heating/cooling loads.
4. Design/size an HVAC system for a given building through a class project.

M E 405. Special Topics**3 Credits (3)**

Topics of modern interest to be offered by the departmental staff. May be repeated up to 12 credits.

Prerequisite(s): Senior standing.

M E 425. Design of Machine Elements**3 Credits (3)**

Design of machine elements through the application of mechanics. Fatigue and theories of failure. Design projects assigned. May be repeated up to 3 credits.

Prerequisite: C- or better grades in M E 326.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

M E 426. Design Project Laboratory I**3 Credits (6P)**

Students address a design problem in which innovation and attention to detail are emphasized. Solution of the problem entails applications of mechanics and/or the thermal sciences.

Prerequisite(s)/Corequisite(s): M E 425.

M E 427. Design Project Laboratory II**3 Credits (6P)**

Continuation of M E 426.

Prerequisite: M E 426.

M E 445. Experimental Methods II**3 Credits (2+3P)**

Emphasis on experimental techniques, instrumentation and data acquisition in fluid mechanics, heat transfer, and thermodynamics. Laboratory results will be presented in written and verbal formats. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 338 or A E 339), M E 340, M E 341, and M E 345.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. An ability to communicate effectively with a range of audiences
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

M E 449. Mechanical Engineering Senior Seminar**1 Credit (1)**

Senior seminar course covering topics relevant to graduating mechanical engineering seniors (job placement, interviewing techniques, resume preparation).

Prerequisite: senior standing.

M E 452. Control System Design**3 Credits (3)**

Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.

Prerequisite: M E 261, M E 328 and ENGR 234.

Learning Outcomes

1. Construct a block diagram to find a transfer function for a dynamical system;
2. Analyze control systems by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques;
3. Design and simulate automatic control systems for mechanical and aerospace engineering applications.

M E 456. Experimental Modal Analysis**3 Credits (3)**

Emphasis on hands-on techniques for structural vibration tests for practical applications. Interpretation of experimental results by means of advanced signal processing tools, basic system identification methodology, and reduced-order modeling procedures. May be repeated up to 3 credits.

Prerequisite: M E 328 and M E 261.

Learning Outcomes

1. An ability to experimentally perform modal analysis for multi-degree-of-freedom systems, which can be extended to continuous systems and actual engineering structures.

M E 457. Engineering Failure Analysis**3 Credits (3)**

Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn how to systematically conduct failure analysis, identify cause(s) of failure, suggest remedial steps to prevent failures and/or improve performance for a variety of engineering applications involving metals, polymers, ceramics and composites.

M E 458. Properties and Mechanical Behavior of Materials**3 Credits (3)**

Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture.

Learning Outcomes

1. Students will learn how to correlate mechanical behavior of materials with their microstructure, processing history and composition.
2. As practicing engineers, they will be able to recognize impact of operating conditions, predict life span, and design materials to improve reliability and efficiency.
3. They will be able to select appropriate materials for a given application from class of materials such as metals, polymers, ceramics and composites.

M E 460. Applied Finite Elements**3 Credits (3)**

Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process. May be repeated up to 3 credits. Crosslisted with: M E 518.

Prerequisite(s): M E 425.

M E 481. Alternative and Renewable Energy**3 Credits (3)**

Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed. May be repeated up to 3 credits.

Prerequisite: M E 341.

Learning Outcomes

1. Understanding of current and future energy needs of the United States and the whole world from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass.

M E 486. Introduction to Robotics**3 Credits (3)**

This course provides students with an introduction to the theories and methods for analysis, design, and control of robotic manipulators. This course is devoted to understanding the spatial descriptions and transformations, kinematics, and dynamics of these mechanisms and how to practically implement these concepts into actual robotic manipulators. May be repeated up to 3 credits.

Prerequisite: M E 328 and ENGR 234.

Learning Outcomes

1. Model and analyze the kinematics and dynamics of robotic manipulators;
2. Program and control these robotic platforms;
3. Apply the theoretical methods into industrial robots;
4. Implement the knowledge and experiences in real-world engineering projects.

M E 487. Mechatronics**3 Credits (2+3P)**

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. May be repeated up to 3 credits.

Prerequisite(s): M E 210 and M E 345.

M E 502. Elasticity I**3 Credits (3)**

Introduction to stress tensor, strain tensor, constitutive law, energy theorems, plane stress and plane strain. Also covers torsion of shafts and propagation of stress waves in elastic solids.

M E 503. Thermodynamics**3 Credits (3)**

A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.

M E 504. Continuum Mechanics**3 Credits (3)**

Basic introduction to the Mechanics of Continuous Media. Its aim is to prepare the student for more advanced courses in Solid and Fluid Mechanics. The topics to be covered include: introduction to Cartesian tensors, tensor algebra and calculus; Lagrangian and Eulerian kinematics; Cauchy and Piola-Kirchhoff stresses; general principles of conservation; constitutive theory for ideal fluids, Newtonian and non-Newtonian fluids, finite and linear elasticity.

M E 509. Individualized Study**3 Credits (3)**

Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.

M E 510. Special Topics**1-6 Credits**

Topics in mechanical engineering. May be repeated for a maximum of 6 credits.

Prerequisite: consent of the department head.

M E 511. Dynamics**3 Credits (3)**

An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics.

M E 512. Vibrations**3 Credits (3)**

Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.

M E 517. Nonlinear Dynamics and Chaos**3 Credits (3)**

Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincare maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos

M E 518. Finite Element Analysis**3 Credits (3)**

Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis. May be repeated up to 3 credits. Crosslisted with: M E 460.

M E 527. Linear Systems Theory**3 Credits (3)**

Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer. May be repeated up to 3 credits.

Learning Outcomes

1. Students are able to design linear multi-input-multi-output (MIMO) control systems.

M E 530. Intermediate Fluid Mechanics**3 Credits (3)**

Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.

M E 533. Numerical Methods for Computational Fluid Mechanics and Heat Transfer**3 Credits (3)**

Application of fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior. Complex flow problems addressed through development of a theoretical formulation, followed by application of computational fluid dynamic (CFD) tools, and finally presentation and validation of solution data. May be repeated up to 3 credits.

Prerequisite: M E 530.

Learning Outcomes

1. An ability to apply fluid mechanics theory and computational approaches to advanced flow problems, including viscous/inviscid and laminar/turbulent behavior.

M E 536. Hydrodynamic Stability and Turbulence**3 Credits (3)**

Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory May be repeated up to 3 credits.

Prerequisite: ME 530.

Learning Outcomes

1. An ability to understand fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory.

M E 540. Intermediate Heat Transfer**3 Credits (3)**

Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level.

M E 557. Engineering Failure Analysis**3 Credits (3)**

Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects. May be repeated up to 3 credits.

M E 558. Properties and Mechanical Behavior of Materials**3 Credits (3)**

Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture. May be repeated up to 3 credits.

Prerequisite: CHME 361.

M E 570. Engineering Analysis I**3 Credits (3)**

Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods.

M E 580. Engineering Analysis II**3 Credits (3)**

Engineering analysis with emphasis on engineering applications. Topics include analytical and numerical methods in linear and nonlinear ordinary and partial differential equations.

Prerequisite: M E 570 or consent of instructor.

M E 587. Mechatronics**3 Credits (2+3P)**

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. Crosslisted with: M E 487.

M E 598. Special Research Programs**1-3 Credits**

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.

M E 599. Master's Thesis**15 Credits**

Thesis.

M E 600. Doctoral Research**1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

M E 698. Special Research Programs**1-3 Credits**

May be repeated for a maximum of 6 credits.

M E 700. Doctoral Dissertation**15 Credits**

Dissertation.

M SC-MILITARY SCIENCE

M SC 110. Introduction to Military Science**2 Credits (2+1P)**

Introduction to the Army, the Profession of Arms, and critical thinking. Students will examine the Army Profession and what it means to be a professional in the U.S. Army. The overall focus is on developing basic knowledge and comprehension of the Army Leadership Requirements Model while gaining a complete understanding of the Reserve Officers' Training Corps (ROTC) program, its purpose in the Army, and its advantages for the student. Cadets also learn how resiliency and fitness supports their development as an Army leader. Includes a weekly lab facilitated by MSL III Cadets and supervised by Cadre. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

M SC 111. Introduction to Leadership**2 Credits (2+1P)**

Introduction to the personal challenges and competencies that are critical for effective leadership. Students learn how the personal development of life skills such as critical thinking, time management, goal setting, and communication contribute to effective leadership. Students learn the basics of the communications process and the importance for leaders to develop the essential skills to effectively communicate in the Army. Students will begin learning the basics of squad level tactics that will be reinforced during a weekly lab facilitated by MSL III Cadets and supervised by Cadre. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

M SC 210. Self/Team Development**3 Credits (3+1P)**

A focus on leadership and decision making. The course adds depth to the student's understanding of the Adaptability Army Learning Area. Outcomes are demonstrated through Critical and Creative Thinking and the ability to apply Troop Leading Procedures (TLP) to apply Innovative Solutions to Problems. The Army Profession is also stressed through leadership forums and a leadership self-assessment. Students are then required to apply their knowledge outside the classroom in a hands-on performance-oriented environment during a weekly lab facilitated by MSL III Cadets and supervised by Cadre and three physical fitness sessions per week. Restricted to Las Cruces campus only.

M SC 211. Leadership in Action and Team Building**3 Credits (3+1P)**

A focus on Army doctrine and team development. The course begins the journey to understand and demonstrate competencies as they relate to Army doctrine. Army Values, Teamwork, and Warrior Ethos and their relationship to the Law of Land Warfare and philosophy of military service are also stressed. The ability to lead and follow is also covered through Team Building exercises at squad level. Students are then required to apply their knowledge outside the classroom in a hands-on performance-oriented environment during a weekly lab facilitated by MSL III Cadets and supervised by cadre and three physical fitness sessions per week. Restricted to Las Cruces campus only.

M SC 225. Directed Studies**1-3 Credits**

Individual directed studies under supervision of the Professor of Military Science. May be repeated up to 12 credits. Restricted to Las Cruces campus only.

Prerequisite(s): GPA 2.5 or better.

M SC 310. Leading Small Organizations I**3 Credits (3)**

Part of the Senior ROTC Advanced Course, this course provides a Focus on training management and the warfighting functions. It is an academically challenging course where Cadets study, practice, and apply the fundamentals of Training Management and how the Army operates through the Warfighting functions. At the conclusion of this course, Cadets will be capable of planning, preparing, and executing training for a squad conducting small unit tactics. Includes one lab meeting per week using peer facilitation overseen by MSL IVs, supervised by ROTC Cadre and three physical fitness sessions per week. Students must meet Basic Course of Military Science requirements to enroll in this course.

Corequisite(s): M SC 310 L.

M SC 310 L. Leading Small Organizations I Lab**1 Credit (1P)**

Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 310.

Corequisite(s): M SC 310.

M SC 320. Leading Small Organizations II**3 Credits (3)**

Part of the Senior ROTC Advanced Course, this course provides a focus on applied leadership in small unit operations. It is an academically challenging course where Cadets study, practice, and apply the fundamentals of direct level leadership and small unit tactics at the platoon level. At the conclusion of this course, Cadets will be capable of planning, coordinating, navigating, motivating and leading a platoon in the execution of a mission. Includes one lab meeting per week using peer facilitation overseen by MSL IVs, supervised by ROTC Cadre and three physical fitness sessions per week. Successful completion of this course is a requirement to Cadet Summer Training Advance Camp during the summer, at Fort Knox, KY. **Prerequisite(s):** M SC 310

Corequisite(s): M SC 320 L.

M SC 320 L. Leading Small Organizations II Lab**1 Credit (1P)**

Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open to students taking M SC 320.

Corequisite(s): M SC 320.

M SC 325. Advanced Directed Studies**1-3 Credits**

Directed individual study of advanced subjects under the guidance of the Professor of Military Science. May be repeated up to 12 credits.

Prerequisite(s): GPA 2.5 or better.

M SC 350. Cadet Summer Training Advanced Course**3 Credits (3)**

Advanced Camp. Advanced Camp is a 31-day training event which takes place at Fort Knox, KY. It is designed to assess a Cadet's ability to demonstrate proficiency in basic officer leadership tasks. Cadets are evaluated on their ability to lead at the Squad and Platoon levels, both in garrison and tactical environments. Cadets are mentally and physically tested during a 12-day consequence driven field training exercise that replicates a combat training center rotation. Successful completion of the Advanced Camp is a requirement for commissioning. Consent of Instructor required.

Prerequisite(s): M SC 310, M SC 310 L, M SC 320, and M SC 320 L.

M SC 401. Leadership Challenges and Goal Setting**3 Credits (3)**

Part of the Senior ROTC Advanced Course, this course provides a focus on development of the Army Officer. It is an academically challenging course where Cadets develop knowledge, skills, and abilities to plan, resource, and assess training at the small unit level. Cadets also learn about Army programs that support counseling subordinates and evaluating performance, values and ethics, career planning, and legal responsibilities. At the conclusion of this course, Cadets will be familiar with how to plan, prepare, execute, and continuously assess the conduct of training at the company or field grade officer level. Includes a lab per week overseeing MSL III lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week. May be repeated up to 3 credits. **Prerequisite(s):** M SC 320

Corequisite(s): M SC 401 L.

M SC 401 L. Leadership Challenges and Goal Setting Lab**1 Credit (1P)**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 401. May be repeated up to 1 credits.

Corequisite(s): M SC 401.

M SC 402. Transition to Lieutenant**3 Credits (3)**

The final course within the Senior ROTC Advanced Course, this course is an academically challenging course where Cadets further develop knowledge, skills, and abilities required of junior officers pertaining to the Army in Unified Land Operations and Company Grade Officer roles and responsibilities. This course includes reading assignments, homework assignments, small group assignments, briefings, case studies, practical exercises, a mid-term exam, and an Oral Practicum as the final exam. The Oral Practicum explores the Cadet's knowledge of how they will be prepared for the 20 Army Warfighting Challenges (AWFC) covered throughout the ROTC Advanced Course. Successful completion of this course will assist in preparing Cadets for their BOLC B course following graduation and commissioning. It is a mandatory requirement for commissioning. Includes a lab per week overseeing MSL III lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week. May be repeated up to 3 credits. **Prerequisite(s):** M SC 401

Corequisite(s): M SC 402 L.

M SC 402 L. Transition to Lieutenant Lab**1 Credit (1)**

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution, and evaluation of training and activities with basic course students and ROTC program. Open only to students taking M SC 402. May be repeated up to 1 credits.

Corequisite(s): M SC 402.

M SC 425. Practicum**1-4 Credits**

Independent projects conducted under the direction of the Professor of Military Science, and concerned with analysis of selected leadership or management problems. Course not eligible for S/U grade. May be repeated up to 16 credits.

M SC 465 L. Military Decision Making - Graduate Level Lab**1 Credit (1)**

Students will work as part of a planning team in the application of the Military Decision Making Process to planning, coordination, and publish a comprehensive training plan and guidance which outlines all training and activities of the NMSU Army ROTC program for the semester following the semester of the course (i.e. the fall course develops the spring plan). Students develop and refine leadership skills in positions of responsibility. Open only to students taking M SC 465. May be repeated up to 1 credits. Consent of Instructor required. Consent of Professor of Military Science (PMS) is required and the PMS will interview all prospective students prior to enrolling into this course.

Corequisite(s): M SC 465.

MAT-AUTOMATION & MANUFACTURING

MAT 102. Print Reading for Industry**3 Credits (2+2P)**

Reading, interpretation, and revisions of industrial technical drawings common to manufacturing, Aerospace, machine parts, electrical, hydraulic, and Pneumatic drawings. Interpretation of engineering drawings and related shop calculations. Introduction Crosslisted with: AERT 113. Restricted to: Community Colleges only.

MAT 105. Introduction to Manufacturing**3 Credits (2+2P)**

Introduction to manufacturing evolution from basic assembly process to modern automated processes. Covers history, employability, soft skills, quality measurements, teamwork concept, production requirements, and considerations in plan layout and design. Minimum math proficiency of CCDM 114 required or math placement into MATH 1215 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 112

MAT 106. Applied Manufacturing Practices**3 Credits (2+2P)**

Course will illustrate how various products are manufactured along with associated process. Mechanical behavior such as bending, cold worked, strained, work hardened, and heat transfer will be emphasized as well. In lab, students will learn how to make selected products starting from prints to complete projects including quality control. Crosslisted with: AERT 114. Restricted to: Community Colleges only.

MAT 110. Machine Operation and Safety**3 Credits (2+2P)**

Introduction to the operation and safety aspects of various types of machinery and equipment, including both mechanical and electrical machines, Rigid Tubing, and Flexible Lines. Maintenance and safety operation of industrial equipment will also be covered. Restricted to: Community Colleges only. Crosslisted with: AERT 115

MAT 130. Applied Industrial Electricity I**4 Credits (3+2P)**

Electrical safety, AC and DC circuits, use and care of common measuring instrumentation, schematic and wiring diagrams, electromagnetism, National Electric Code branch circuits. Restricted to: Community Colleges only.

Prerequisite(s): MATH 1215 or ELT 120 or OETS 118.

MAT 135. Applied Industrial Electricity II**4 Credits (3+2P)**

Relationship between motor power, speed, and torque, basic application of relay circuits, motor control circuits, inductance and capacitance factors, transformers, solid state devices circuits and applications. Restricted to: Community Colleges only.

Prerequisite(s): MAT 130.

MAT 145. Electromechanical Systems for Non-Majors**4 Credits (3+3P)**

Electromechanical system interfacing. Principles and applications of preventive and corrective maintenance procedures on automated industrial production machines using system technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams.

Prerequisite: consent of instructor.

MAT 221. Cooperative Experience I**1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and rated by employer and instructor. Student meets in a weekly class. Graded S/U.

Prerequisite: consent of instructor.

MAT 234. Industrial Electricity Maintenance**3 Credits (2+2P)**

Introduction into electrical systems, theory and uses for the different types of motors used in the industry and related industrial safety practices. DC, AC stepper and servo motors, motor speed and torque, motor performance, and efficiency, motor control fundamentals using variable frequency drives, vector controls, servo and stepper drives. Restricted to: Community Colleges only.

MAT 265. Special Topics**1-6 Credits**

Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

MATH-MATHEMATICS

A student may not receive credit for a lower-division mathematics course if it serves as a prerequisite to a lower-division math course that the student had previously passed with a grade of C- or better.

Students without adequate placement to enroll in MATH 1134, MATH 1215 or MATH 1130G can gain admission to the course by earning a C- or better in CCDM 114 N at an NMSU Community College campus, or in ARSC 1120.

Students wishing to enroll in MATH 1220G, MATH 1430G, MATH 1511G, MATH 1521G, or MATH 1350G must satisfy one of the following:

1. have passed the stated prerequisite course or an equivalent transfer course with a C- or better
2. have placed into the course with an adequate ACT Math score or through the Mathematics Placement Examination (MPE), the results of which will be made available to the student's advisor. The MPE is given daily in Walden Hall when school is in session and during new student orientation programs.

MATH 1130G. Survey of Mathematics**3 Credits (3)**

This course will develop students' ability to work with and interpret numerical data, to apply logical and symbolic analysis to a variety of problems, and/or to model phenomena with mathematical or logical reasoning. Topics include financial mathematics used in everyday life situations, statistics, and optional topics from a wide array of authentic contexts. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.

Learning Outcomes

1. Construct and analyze graphs and/or data sets: Gather and organize information; Understand the purpose and use of various graphical representations such as tables, line graphs, tilings, networks, bar graphs, etc.; Interpret results through graphs, lists, tables, sequences, etc.; Draw conclusions from data or various graphical representations.
2. Use and solve various kinds of equations: Understand the purpose of and use appropriate formulas within a mathematical application; Solve equations within a mathematical application; Check answers to problems and determine the reasonableness of results.
3. Understand and write mathematical explanations using appropriate definitions and symbols: Translate mathematical information into symbolic form; Define mathematical concepts in the student's own words; Use basic mathematical skills to solve problems.
4. Demonstrate problem solving skills within the context of mathematical applications; Show an understanding of a mathematical application both orally and in writing; Choose an effective strategy to solve a problem; Gather and organize relevant information for a given application.

MATH 1134. Fundamentals of Elementary Mathematics I
3 Credits (3)

Numbers and the four operations of arithmetic. Understanding and comparing multiple representations of numbers and operations, in particular how these representations build from whole numbers to integers to fractions and decimals. Applying properties of numbers and operations in contextual situations. Reasoning, communicating, and problem solving with numbers and operations. Applications to ratio, and connections with algebra. Taught primarily through student activities and investigations. Restricted to: EDUC,EPAR,E ED,ECED majors. May be repeated up to 3 credits.

Prerequisite: C- or better in ENGL 1110G; adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.

Learning Outcomes

1. As future elementary teachers you will be teaching mathematics to children.
2. In order to teach a subject well you need not only to know the material that you will teach, but you need to know more than what you will teach, and know it well, in order to be able to answer questions, understand student reasoning, give alternate explanations when your students do not understand something, and be able to adjust to changes in the mathematical curriculum.
3. Furthermore, even if you hope to teach a given grade, you should be prepared to teach a variety of grades since what a person ends up teaching is often not what they planned to do.
4. We will explore ideas of arithmetic in a way to help you improve your mathematical ability, gain confidence in your ability, introduce to you different ideas and models, and to see a variety of mathematical activities that are appropriate for people of all ages.
5. Everything we study will be done with the aim of developing your ability to relate to the mathematics of elementary school and to help children develop mathematical understanding

MATH 1215. Intermediate Algebra
3 Credits (3)

A study of linear and quadratic functions, and an introduction to polynomial, absolute value, rational, radical, exponential, and logarithmic functions. A development of strategies for solving single-variable equations and contextual problems. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.

Learning Outcomes

1. Students will build on their knowledge of linear and quadratic functions and will begin to build an understanding of absolute value, polynomial, rational, power, radical, exponential and logarithmic functions in the following contexts: Demonstrate appropriate use of basic function language and notation; Convert between equivalent forms of algebraic expressions; Solve single-variable equations of the types listed above; Interpret and communicate algebraic solutions graphically and numerically; Demonstrate contextual problem-solving skills that include setting up and solving problems, and interpreting solutions in context; Apply appropriate problem solving methods from among algebraic, graphical, and numerical.

MATH 1217. General Supplemental Instruction I
1 Credit (2P)

Collaborative workshop for students enrolled in Intermediate Algebra. Graded: S/U Grading (S/U, Audit). Corequisite(s): MATH 1215

Learning Outcomes

1. Intermediate Algebra Workshop provides time for students to work on problems from Intermediate Algebra under the guidance of their Intermediate Algebra instructor

MATH 1220G. College Algebra
3 Credits (3)

The study of equations, functions and graphs, reviewing linear and quadratic functions, and concentrating on polynomial, rational, exponential and logarithmic functions. Emphasizes algebraic problem solving skills and graphical representation of functions. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.

Learning Outcomes

1. Use function notation; perform function arithmetic, including composition; find inverse functions.
2. Identify functions and their transformations given in algebraic, graphical, numerical, and verbal representations, and explain the connections between these representations.
3. Graph and interpret key feature of functions, e.g., intercepts, leading term, end behavior, asymptotes.
4. Solve equations algebraically to answer questions about graphs, and use graphs to estimate solutions to equations.
5. Solve contextual problems by identifying the appropriate type of function given the context and creating a formula based on the information given.
6. Communicate mathematical information using proper notation and verbal explanations.

MATH 1221. General Supplemental Instruction II
1 Credit (1+2P)

Collaborative workshop for students enrolled in College Algebra. Graded: S/U Grading (S/U, Audit).

Corequisite(s): MATH 1220G.

Learning Outcomes

1. College Algebra Workshop provides time for students to work on problems from College Algebra under the guidance of their College Algebra instructor

MATH 1250G. Trigonometry & Pre-Calculus**4 Credits (3+2P)**

Trigonometry & Pre-Calculus includes the study of functions in general with emphasis on the elementary functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions. Topics include rates of change, limits, systems of equations, conic sections, sequences and series, trigonometric equations and identities, complex number, vectors, and applications. May be repeated up to 4 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G.

Learning Outcomes

1. (Trigonometry) Students will be able to define and evaluate the trigonometric functions as functions of angle in both degree and radian measure using the definitions in terms of x , y , and r ; as the ratio of sides of a right triangle; using the unit circle; using reference angles, commonly used (0° , 30° , 45° , 60° , 90°) angles and using a calculator.
2. (Trigonometry) Students will be able to solve right triangles. They will be able to draw a sketch in an applied problem when necessary.
3. (Trigonometry) Students will be able to solve non-right triangles using the law of sines and the law of cosines.
4. (Trigonometry) Students will be able to prove trigonometric identities and apply addition and subtraction, double-angle, half-angle and power reduction formulas.
5. (Trigonometry) Students will be able to graph the six trigonometric functions, their transformations and their inverses.
6. (Trigonometry) Students will be able to use algebraic methods, including the use of identities and inverses, to solve trigonometric equations and demonstrate connections to graphical and numerical representations of the solutions.
7. (Trigonometry) Students will be able to add and subtract vectors in two dimensions. They will be able to use the dot product to project one vector onto another and to determine the angle between two vectors. They will be able to solve a variety of word problems using vectors.
8. (Trigonometry) Students will be able to work with polar coordinates; this includes graphing in polar coordinates and transforming an equation with polar coordinates into one with rectangular coordinates, and vice versa.
9. (Trigonometry) Students will be able to work with the trigonometric form of complex numbers, including using De Moivre's formula. 1
10. (Pre-Calculus) Functions: Reinforce recognizing a function from its graph and from its algebraic expression; Reinforce identification of a one-to-one function graphically and from its algebraic expression; Reinforce identification of inverse functions graphically and algebraically; Reinforce combining functions arithmetically and compositionally; Be able to calculate the average rate of change of a function using the difference quotient and depict it graphically; Be able to find a limiting value of a function and be able to identify and use the notation that describes this. 1
11. (Pre-Calculus) Graphing: Reinforce using key characteristics of functions to graph them; Be able to graph conic sections from their key characteristics such as foci, eccentricity and asymptotes; Be able to identify all functions mentioned from their graphs, describing their key aspects. 1
12. (Pre-Calculus) Solving: Exponential/Logarithmic equations using the rules of exponents and logarithms; Systems of linear equations by elimination; Non-linear systems algebraically and graphically. 1
13. (Pre-Calculus) Applications: Modeling with functions with an emphasis on exponential and logarithmic functions, growth and decay. 1
14. (Pre-Calculus) Sequences and series: Understand the concept and

MATH 1350G. Introduction to Statistics**3 Credits (3)**

This course discusses the fundamentals of descriptive and inferential statistics. Students will gain introductions to topics such as descriptive statistics, probability and basic probability models used in statistics, sampling and statistical inference, and techniques for the visual presentation of numerical data. These concepts will be illustrated by examples from a variety of fields.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.

Learning Outcomes

1. Explain the general concepts of statistics: Explain and evaluate statistics used in the real world (from a news article, research project, etc.); Use statistical vocabulary appropriately; Distinguish between descriptive and inferential statistics; Distinguish between qualitative and quantitative data; Distinguish between populations and samples, and parameters and statistics; Give examples of independent and dependent variables.
2. Presentation and description of data: Present data graphically using histograms, frequency curves and other statistical graphs; Interpret graphs of data, including histograms and shapes of distributions.
3. Summarize data using measures of central tendency and variation: Calculate and interpret the mean, median, and mode to describe data; Calculate and interpret range, variance, and standard deviation to describe data.
4. Present the concepts of probability: Interpret basic probabilities; Calculate probabilities using compound probability rules and the binomial distribution; Calculate probabilities using the standard normal distribution and relate them to areas under the curve; Determine if the binomial distribution can be approximated with the normal distribution; Describe the relationship between the sampling distribution and the population distribution; Use the central limit theorem to approximate the probability distribution and calculate probabilities.
5. Compute point and interval estimates: Determine the confidence interval for a parameter; Interpret the confidence level and margin of error; Determine whether a statistical technique is appropriate under stated conditions.
6. Perform hypothesis tests: Determine whether a statistical test is appropriate under stated conditions; Identify null and alternative hypothesis; Perform and interpret statistical tests (e.g. z-test, t-test, one-tailed and two-tailed, one-sample, two-sample) and determine whether data is statistically significant; State the conclusion of a hypothesis test; Interpret a p-value as compared to a significance level; Explain why a test can lead us to reject a null hypothesis, not accept one; Distinguish between Type I and Type II errors.
7. Analyze data using regression and correlation: Explain the difference between correlation and causation; Construct and interpret scatter plots; Calculate and interpret the linear correlation coefficient; Determine and use the equation of a least-squares regression line between two variables to make predictions; Interpret the meaning of the coefficient of determination.
8. Optional topics: Inter-quartile range, box-plots, stem-and-leaf plots; Combinations and permutations; The Poisson distribution; Statistical power; Chi-square; Analysis of variance.

MATH 1430G. Applications of Calculus I**3 Credits (2+2P)**

An algebraic and graphical study of derivatives and integrals, with an emphasis on applications to business, social science, economics and the sciences. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G or higher.

Learning Outcomes

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
4. Use the derivative to describe the rate of change and slope of a curve in general and at particular points. Compare and contrast average rates of change to instantaneous rates of change.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find the antiderivative and indefinite integral functions to include integration by substitution. Apply the Fundamental Theorem of Calculus in computing definite integrals of functions.
7. Approximate the area under the curve using Riemann sums.
8. Use the integral to determine the area under a curve and to find the accumulated value of a function in context.
9. Solve contextual problems by identifying the appropriate type of function given the context, creating a formula based on the information given, applying knowledge of algebra and calculus, and interpreting the results in context. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1435. Applications of Calculus I**3 Credits (3)**

Intuitive differential calculus with applications to engineering.

Prerequisite(s): C- or better in MATH 1250G.

Learning Outcomes

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Learn derivative rules for polynomial, exponential, logarithmic, trigonometric and inverse trigonometric functions.
4. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find partial derivatives and find maxima, minima in three dimensions.
7. Find the linear approximation of a function.
8. Find Maclaurin and Taylor series.
9. Find limits via L'Hospital's rule. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1440. Applications of Calculus II**3 Credits (3)**

Topics in this second course of Applications of Calculus include functions of several variables, techniques of integration, an introduction to basic differential equations, and other applications.

Prerequisites: C or better in MATH 1435 or in MATH 1521G, or in MATH 1521H.

Learning Outcomes

1. Find definite and indefinite integrals using integration by parts, integral tables, and numerical integration.
2. Analyze multivariable functions using partial derivatives and double integrals, and apply these techniques to applications such as optimization, least squares, and volumes.
3. Solve differential equations graphically, numerically, and algebraically using separation of variables, and apply differential equations in context.
4. Apply differentiation and integration to other areas, for example to Taylor polynomials and Taylor series, probability, trigonometric functions, etc.

MATH 1511G. Calculus and Analytic Geometry I**4 Credits (4)**

Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule. May be repeated up to 4 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1250G.

Learning Outcomes

1. The goals are to present the concepts of calculus, stressing techniques, applications, and problem solving, and emphasizing numerical aspects such as approximations and order of magnitude.
2. Overall, the goals are to illustrate the power of calculus as a tool for modeling situations arising in physics, science, engineering and other fields.
3. In fulfillment of these goals, this and later courses will stress topics such as polynomial approximation, setting up integrals, as well as the use of appropriate technology.

MATH 1521G. Calculus and Analytic Geometry II**4 Credits (4)**

Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series. May be repeated up to 4 credits.

Prerequisite: C- or better in MATH 1511G.

Learning Outcomes

1. Recognize the interplay between Riemann sums and definite integrals
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals
3. Demonstrate an understand of the relationship between the derivative and the definite integral
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's)
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions
6. Use integration to solve problems in geometry, physics, science, engineering and other fields
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals
8. Approximate functions using Taylor polynomials
9. Apply standard tests to determine convergence or divergence of sequences and series
10. Find a power series representation for a function and determine where it converges
11. Identify and evaluate first order differential equations

MATH 1521H. Calculus and Analytic Geometry II Honors**4 Credits (3+1P)**

A more advanced treatment of the material of MATH 1521G with additional topics. Consent of Instructor required. Restricted to Las Cruces campus only. May be repeated up to 4 credits.

Learning Outcomes

1. Recognize the interplay between Riemann sums and definite integrals.
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
3. Demonstrate an understand of the relationship between the derivative and the definite integral.
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions.
6. Use integration to solve problems in geometry, physics, science, engineering and other fields.
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
8. Approximate functions using Taylor polynomials.
9. Apply standard tests to determine convergence or divergence of sequences and series.
10. Find a power series representation for a function and determine where it converges.
11. Identify and evaluate first order differential equations.

MATH 1531. Introduction to Higher Mathematics**3 Credits (3)**

Logic; sets, relations, and functions; introduction to mathematical proofs.

Prerequisite(s): C- or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. The primary objective of this course is to serve as a bridge between the calculus courses you have taken, where the focus is on computations and solving problems, to more abstract mathematics courses.
2. In particular, we will discuss logical reasoning, definitions, proofs, and certain basic building blocks such as sets, functions, and relations.
3. By the end of the course, you should be able to understand and construct well-written proofs of basic mathematical arguments involving simple properties of the real numbers, integers, sets, functions, and relations using universal and existential quantifiers, absolute values and inequalities, modular arithmetic, and proof by induction.

MATH 1996. Topics in Mathematics**1-3 Credits**

Topics to be announced in the Schedule of Classes. Maximum of 3 credits per semester. Total credit not to exceed 6 credits. Community Colleges only.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

MATH 2134G. Fundamentals of Elementary Math II**3 Credits (3)**

Geometry and measurement. Multiple approaches to solving problems and understanding concepts in geometry. Analyzing and constructing two- and three-dimensional shapes. Measurable attributes, including angle, length, area, and volume. Understanding and applying units and unit conversions. Transformations, congruence, and symmetry. Scale factor and similarity. Coordinate geometry and connections with algebra. Reasoning and communicating about geometric concepts. Taught primarily through student activities and investigations. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 1134.

Learning Outcomes

1. The primary objectives are mathematical: to understand some of the basic concepts of geometry, and measurement with an appropriate level of rigor; to appreciate the historical, cultural and educational contributions and potential applications in real life situations; and to gain problem solving skills using these concepts.
2. The secondary goal is to appreciate the importance of this material in the elementary school curriculum.

MATH 2234. Fundamentals of Elementary Mathematics III**3 Credits (3)**

Probability, statistics, ratios, and proportional relationships. Experimental and theoretical probability. Collecting, analyzing, and displaying data, including measurement data. Multiple approaches to solving problems involving proportional relationships, with connections to number and operation, geometry and measurement, and algebra. Understanding data in professional contexts of teaching. Taught primarily through student activities and investigations. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 2134G.

Learning Outcomes

1. In order to teach a subject well you need not only to know the material that you will teach, but you need to know more than what you will teach, and know it well, in order to be able to answer questions, give alternate explanations when your students do not understand something, and be able to adjust to changes in the mathematical curriculum.
2. Furthermore, even if you hope to teach a certain grade, you should be prepared to teach anything between kindergarten and 8th grade.
3. You also need to be aware of where a student is coming from in order to make adjustments in their curriculum.
4. A strong elementary school teacher must understand where his/her students are headed in order to most effectively direct them there.
5. This is especially true in mathematics, where students continue to build on the concepts they learn each year.

MATH 2350G. Statistical Methods**3 Credits (3)**

Exploratory data analysis. Introduction to probability, random variables and probability distributions. Concepts of Central Limit Theorem and Sampling Distributions such as sample mean and sample proportion. Estimation and hypothesis testing single population parameter for means and proportions and difference of two population parameters for means and proportions. Analysis categorical data for goodness of fit. Fitting simple linear regression model and inference for regression parameters. Analysis of variance for several population means. Techniques in data analysis using statistical packages. May be repeated up to 3 credits.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.

Learning Outcomes

1. Summarize Data through graphs and Descriptive statistics: Define qualitative and quantitative data; Provide examples of a population, a sample, independent and dependent variables, parameters and statistics; Construct and interpret histograms, stem plots, bar charts, and boxplot; Summarize distributions with numerical measures such as mean, median, standard deviation, percentiles, interquartile range.
2. Present the concepts of probability: Explain related to probability axioms (e.g. mutually exclusive events and independent events); Apply applications of probability rules; Apply Conditional probability and Bayes Rule.
3. Distinguish between discrete and continuous random variables: Calculate probabilities using Binomial and Poisson distributions; Calculate probabilities using the standard normal distribution by finding the area underneath the curve.
4. Explain the Central Limit Theorem: Introduce the concept of a sampling distribution; Discuss the distribution of the sample mean and sample proportion under repeated sampling; Generate and interpret a sampling distribution using repeated sampling; Determine if the Binomial and Poisson distribution can be approximated with the normal distribution.
5. Estimate a population parameter: Determine confidence interval for population mean, proportion, difference of means, and difference of proportions; Interpret the confidence interval and margin of error; Explain the dependence of margin of error on sample size and confidence level.
6. Perform hypothesis tests for population parameters (population mean, proportion, difference of means, and difference of proportions); Describe the logic and framework of the inference of hypothesis testing; Make a decision using a p-value and draw an appropriate conclusion; Distinguish between Type I and Type II errors; Explain power of the test.
7. Perform Hypothesis Tests for Categorical data: Determine and analyze Chi-square test for Independence; Determine and analyze Chi-square test for Goodness of fit.
8. Analyze data using regression and correlation: Construct scatterplots and analyze the scatter plots; Calculate the linear correlation coefficient and determine whether a linear relationship exists between two variables; Fit the least-squares regression line between two variables; Predict the response variable from the regression line; Apply statistical inference to regression parameters.
9. Perform analysis of variance: State hypotheses for the test of several population means; Construct the AVOVA Table; Explain the significance of multiple comparisons. 1
10. Demonstrate the appropriate use of technology (e.g., Excel, an appropriate graphing calculator or other software (Minitab, SAS)

MATH 2415. Introduction to Linear Algebra**3 Credits (3)**

Systems of equations, matrices, vector spaces and linear transformations. Applications to computer science.

Prerequisite(s): Grade of C- or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. Use row reduction and echelon forms of a matrix to solve linear systems of equations.
2. Use matrix operations, inverse matrices, and matrix factorizations to solve matrix equations.
3. Study the properties of vector spaces and subspaces (e.g., the null and column spaces of a matrix); linear transformations, isomorphisms and kernels; linear independence, bases, and dimension.
4. Apply appropriate matrix manipulations to perform a change of basis.
5. Understand determinants and their properties.
6. Find eigenvalues and eigenvectors and use them to diagonalize matrices.
7. Understand inner product spaces and apply them to real-world problems.

MATH 2530G. Calculus III**3 Credits (3)**

Continuation of Calculus II including multivariate and vector calculus, level curves and surfaces, partial derivatives, gradient, directional derivatives, tangent planes, optimization, multiple integrals in Cartesian, cylindrical and spherical coordinate systems. May be repeated up to 3 credits.

Prerequisite: Grade of C- or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. Use vector notation correctly.
2. Perform vector operations, including dot product, cross product, differentiation and integration, and demonstrate their geometric interpretations.
3. Perform operations on vector valued functions and functions of a parameter.
4. Identify and graph the equations of cylinders and quadratic surfaces in 3-dimensional space.
5. Determine the domain of continuity of a vector valued function and of a function of multiple variables.
6. Compute partial derivatives, generally and at a point, and sketch their graphical representation on a surface in space.
7. Recognize when the chain rule is needed when differentiating functions of multiple variables, parametric equations and vector valued functions, and be able to use the chain rule in these situations.
8. Compute curvature of a parameterized vector representation of a curve in 2- and 3-dimensional space and be able to explain its meaning.
9. Compute the unit tangent and unit normal vectors to a curve and be able to sketch them with the curve. 1
10. Computationally move among position vector, velocity vector, speed, and acceleration vectors; recognize and demonstrate their use as applied to motion in space. 1
11. Determine the equation of the tangent plane to a surface at a point. 1
12. Use the tangent plane to a surface to approximate values on the surface and estimate error in approximation using differentials 1
13. Compute directional derivatives and represent them graphically relative to the inherent surface. 1
14. Compute the gradient vector; represent it graphically relative to the inherent surface and use it to maximize or minimize rate of change of the function. 1
15. Locate local and global maxima and minima of a function. 1
16. Use Lagrange multipliers to maximize output with one or two constraints. 1
17. Compute arc length and be able to explain its derivation as a limit. 1
18. Calculate double and triple integrals independently and with their geometric representations as surfaces, areas and volumes. 1
19. Calculate iterated integrals in polar, cylindrical and spherical coordinate systems.

MATH 2992. Directed Study**1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of the instructor.

Learning Outcomes

1. Varies

MATH 300. Readings**1-3 Credits**

A selection of readings and reports in the mathematical sciences, the breadth and depth of which is deemed to fit the needs of the student. Graded S/U.

Prerequisite: consent of instructor.

MATH 313. Fundamentals of Algebra and Geometry I**3 Credits (3+1P)**

Covers algebra combined with geometry based on measurements of distance (metric geometry). Secondary mathematics education majors may take course as a math elective. MATH 313 does not substitute for other required math courses. Does not fulfill requirements for major in mathematics.

Prerequisites: MATH 1134 and MATH 2134G.

MATH 331. Introduction to Modern Algebra**3 Credits (3)**

Elements of abstract algebra, including groups, rings and fields.

Prerequisite: C or better in MATH 1531 and MATH 2415.

MATH 332. Introduction to Analysis**3 Credits (3)**

Development of the real numbers, a rigorous treatment of sequences, limits, continuity, differentiation, and integration. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 1531.

Learning Outcomes

1. Understand the Axiom of Completeness and be able to work with suprema and infima.
2. Know the basic definitions of sequences and be able to understand and construct rigorous epsilon-N proofs.
3. Understand the properties of convergent sequences and be able to construct related proofs.
4. Know the basic definitions of limits and be able to understand and construct epsilon-delta proofs.
5. Be familiar with the basic properties and topology of the reals.

MATH 333. Introduction to Geometry**3 Credits (3)**

Building on ideas from high school geometry, an introduction to the axiomatic method, transformation groups, and non-Euclidean geometry.

Prerequisite: C- or better in MATH 1531 and MATH 2415.

Learning Outcomes

1. Demonstrate the ability to make conjectures in geometry, refine conjectures, and prove or refute conjectures.
2. Understand how transformations of the plane can be used to define and apply the concepts of congruence and similarity in Euclidean geometry.
3. Solve problems in geometry using different approaches (axioms, coordinates, transformations), and explain how the different approaches are related.
4. Compare the definitions and theorems of Euclidean geometry with the corresponding definitions and theorems in non-Euclidean geometry.

MATH 377. Introduction to Numerical Methods**3 Credits (3)**

Basic numerical methods for interpolation, approximation, locating zeros of functions and integration; numerical linear algebra. Computer-oriented methods will be emphasized. Student must also have some programming experience in order to enroll.

Prerequisite: C- or better in one of MATH 2415, M E 228, or E E 200.

Learning Outcomes

1. Understand the limitations, advantages, and disadvantages of common numerical methods and how they are used to obtain approximate solutions.
2. Apply numerical methods to obtain approximate solutions to mathematical problems.
3. Analyze and evaluate the accuracy of common numerical methods.
4. Write efficient, well-documented code to implement numerical methods.

MATH 391. Vector Analysis**3 Credits (3)**

Calculus of vector valued functions, Green's and Stokes' theorems and applications.

Prerequisite: grade of C or better in MATH 2530G.

MATH 392. Introduction to Ordinary Differential Equations**3 Credits (3)**

Introduction to differential equations and dynamical systems with emphasis on modeling and applications. Basic analytic, qualitative and numerical methods. Equilibria and bifurcations. Linear systems with matrix methods, real and complex solutions.

Prerequisite: C or better in MATH 1521G or MATH 1521H or B or better in MATH 1440.

MATH 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of faculty member.

MATH 401. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be used to fulfill a course requirement for the mathematics major. Consent of Instructor required.

MATH 411V. Great Theorems in Mathematics**3 Credits (3)**

This course examines some significant mathematical achievements from antiquity to the modern era. Evolution of notions and methods in geometry, number theory, algebra, and calculus will be supplemented by cultural and biographical history, placing mathematics in a broad human context.

Prerequisite(s): Grade of C- or higher in MATH 1531, or grade of B or higher in any upper-division math course, or consent of instructor.

Learning Outcomes

1. At the end of this course, students will be able to: Describe the history of the development of some key mathematical concepts.
2. Describe the connections between mathematical ideas in different historical periods and places.
3. Recognize the role of abstraction and logic in the progress of mathematics.
4. Describe the contribution of mathematics to culture and science in different historical eras.
5. Determine if a mathematical conjecture is correct and provide rigorous written mathematical justification.
6. Provide sound, complete and clear mathematical arguments involving simple calculations, geometric constructions, and/or written mathematical proofs.
7. Communicate mathematical ideas, both written and orally.

MATH 450. Introduction to Topology**3 Credits (3)**

Topological spaces: general spaces and specific examples such as metric spaces, Hausdorff spaces and/or normed vector spaces; separation axioms; continuity, compactness, connectedness; related theorems. Crosslisted with: MATH 520.

Prerequisite(s): MATH 332.

MATH 451. Introduction to Differential Geometry**3 Credits (3)**

Applies calculus to curves and surfaces in three dimensional Euclidean space.

Prerequisite(s): C- or better in each of MATH 2415 and MATH 391, or consent of instructor.

MATH 452. Foundations of Geometry**3 Credits (3)**

Topics in projective, axiomatic Euclidean or non-Euclidean geometries. Restricted to: Main campus only.

Prerequisite(s): C or better in MATH 331 or MATH 332.

MATH 454. Logic and Set Theory**3 Credits (3)**

Propositional and first order logic; axioms, proofs, models. Semantic and syntactic consequence. Soundness, completeness, compactness, and Loewenheim –Skolem theorems. The Zermelo-Fraenkel axioms for set theory. Well orderings, ordinals, cardinals, the axiom of choice, and the von Neumann hierarchy. Crosslisted with: MATH 524.

Prerequisite(s): C- or better in MATH 331 or MATH 332, or consent of instructor.

MATH 455. Elementary Number Theory**3 Credits (3)**

Covers primes, congruences and related topics.

Prerequisite: grade of C or better in MATH 331 or consent of instructor.

MATH 456. Abstract Algebra I: Groups and Rings**3 Credits (3)**

Group theory, including cyclic groups, homomorphisms, cosets, quotient groups and Lagrange's theorem. Introduction to rings: ring homomorphisms, ideals, quotient rings, polynomial rings, and principal ideal domains. Crosslisted with: MATH 526.

Prerequisite(s): MATH 331 or consent of instructor.

MATH 459. Survey of Geometry**3 Credits (3)**

Basic concepts of Euclidean geometry, ruler and compass constructions. May include topics in non-Euclidean geometry. For non-math majors.

Restricted to: Main campus only.

Prerequisite(s): C or better in MATH 331 or MATH 332.

MATH 471. Complex Variables**3 Credits (3)**

A first course in complex function theory, with emphasis on applications.

Prerequisite(s): C- or better in MATH 391 or C- or better in both MATH 392 and MATH 2530G.

MATH 472. Fourier Series and Boundary Value Problems**3 Credits (3)**

Fourier series and methods of solution of the boundary value problems of applied mathematics.

Prerequisite(s): C- or better in MATH 392.

MATH 473. Calculus of Variations and Optimal Control**3 Credits (3)**

Euler's equations, conditions for extrema, direct methods, dynamic programming, and the Pontryagin maximal principle.

Prerequisite(s): C- or better in MATH 392.

MATH 480. Applied Linear Algebra**3 Credits (3)**

An application-driven course, whose topics may include the four fundamental subspaces, inner products, orthogonality, diagonalization, and complex matrices. Applications may include factorization, least squares, data compression, singular value decomposition, and discrete Fourier transform.

Prerequisite: C- or better in one of MATH 2415, E E 200, or M E 228.

Learning Outcomes

1. Understand higher-level linear algebra concepts for which matrix linear algebra is the basic tool.
2. Understand how to apply higher-level linear algebra concepts to problems that arise in real-world applications.

MATH 481. Advanced Linear Algebra**3 Credits (3)**

Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics.

Prerequisite: grade of C or better in MATH 331.

MATH 491. Introduction to Real Analysis I**3 Credits (3)**

Rigorous discussion of the topics introduced in calculus. Sequences, series, limits, continuity, differentiation.

Prerequisite: grade of C or better in MATH 332 or consent of instructor.

MATH 492. Introduction to Real Analysis II**3 Credits (3)**

Continuation of MATH 491. Integration, metric spaces and selected topics.

Prerequisite(s): C- or better in MATH 491 or consent of instructor.

MATH 498. Directed Reading**1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

MATH 501. Introduction to Differential Geometry**3 Credits (3)**

Same as MATH 451 with additional work for graduate students.

MATH 502. Foundations of Geometry**3 Credits (3)**

Same as MATH 452 with additional assignments for graduate students.

MATH 505. Elementary Number Theory**3 Credits (3)**

Same as MATH 455 with additional assignments for graduate students.

MATH 511. Fundamentals of Elementary Mathematics I**3 Credits (3+1P)**

Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 1134 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 512. Fundamentals of Elementary Mathematics II**3 Credits (3+1P)**

Real numbers, geometry, and statistics, incorporating calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 2134G undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 513. Fundamentals of Algebra and Geometry I**3 Credits (3+1P)**

Algebra and metric geometry, incorporating appropriate calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 313 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 517. Complex Variables**3 Credits (3)**

Same as MATH 471 with additional work for graduate students.

MATH 518. Fourier Series and Boundary Value Problems**3 Credits (3)**

Same as MATH 472 with additional work for graduate students.

MATH 519. Calculus of Variations and Optimal Control**3 Credits (3)**

Same as MATH 473 with additional work for graduate students.

MATH 520. Introduction to Topology**3 Credits (3)**

Same as MATH 450 with additional work for graduate students. Crosslisted with: MATH 450.

MATH 524. Logic and Set Theory**3 Credits (3)**

Same as MATH 454 with additional assignments for graduate students. Crosslisted with: MATH 454.

Prerequisite(s): consent of instructor.**MATH 525. Advanced Linear Algebra****3 Credits (3)**

Same as MATH 481 with additional work for graduate students. May be repeated up to 3 credits.

MATH 526. Abstract Algebra I: Groups and Rings**3 Credits (3)**

Same as MATH 456 with additional work for graduate students. Crosslisted with: MATH 456.

Prerequisite(s): MATH 525 or consent of instructor.**MATH 527. Introduction to Real Analysis I****3 Credits (3)**

Same as MATH 491 with additional work for graduate students.

MATH 528. Introduction to Real Analysis II**3 Credits (3)**

Same as MATH 492 with additional work for graduate students.

MATH 529. Complex Analysis**3 Credits (3)**

Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations.

Prerequisite: MATH 332.**MATH 530. Special Topics****1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.

MATH 540. Directed Reading**1-6 Credits**

May be repeated for a maximum of 6 credits. Consent of instructor required. Graded: S/U.

MATH 541. Topology I**3 Credits (3)**

Connectedness and compactness of topological spaces, introduction to the quotient topology, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem

Prerequisite(s): MATH 525 and MATH 528, or consent of instructor.**MATH 542. Topology II****3 Credits (3)**

Covering spaces and their classification, singular homology, degree theory, Brouwer's fixed point theorem, CW-complexes and cellular homology, and other applications.

Prerequisite(s): MATH 541 or consent of instructor.**MATH 551. Mathematical Structures in Logic****3 Credits (3)**

Lattices, distributive lattices, Boolean algebras, Heyting algebras. Lindenbaum-Tarski algebras of classical and intuitionistic logics. Representation theorems. Modal logics and their algebraic counterparts. Kripke semantics. Goedel translation.

Prerequisite(s): MATH 524.**MATH 552. Universal Algebra and Model Theory****3 Credits (3)**

Universal algebra, homomorphisms, subalgebras, products, congruences. Varieties and class operators. Free algebras and Birkhoff's theorem. Ultraproducts and Los's theorem. Congruence distributive varieties and Jonsson's theorem. Universal classes and quasi-varieties.

Prerequisite(s): MATH 524.**MATH 562. History and Theories of Mathematics Education****3 Credits (3)**

A study of the history of the mathematics taught in American schools, including an examination of authentic original textbooks and the changes in their content and the approach to the subject over time, together with writings of people who have influenced the development and changes of mathematics education. Theories of learning mathematics, and current issues in mathematics education.

Prerequisite(s): Restricted to graduate students.

MATH 563. Algebra with Connections**3 Credits (3)**

Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 564. From Number to Algebra**3 Credits (3)**

The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 566. Data Analysis with Applications**3 Credits (3)**

Statistical concepts and terminology in professional uses of data by teachers, such as standardized test score reports and educational research; visual displays of data; measures of variation and central tendency; consideration of how K-12 topics in Data Analysis are developed from one grade level to the next. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 567. From Measurement to Geometry**3 Credits (3)**

The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 568. Using Number Throughout the Curriculum**3 Credits (3)**

Understand number concepts more deeply by seeing many examples of those concepts applied in other content strands. Develop mathematical knowledge and understanding to build a repertoire of ways for students to practice and review basic number skills and concepts as part of later, more advanced courses. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 569. Geometry with Connections**3 Credits (3)**

Connections between Geometry and other K-12 curriculum strands, especially Algebra and Probability / Data Analysis. Address key attributes of geometric concepts by considering their connections within and across grade levels. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.

Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 571. Partial Differential Equations I**3 Credits (3)**

The basic equations of mathematical physics. Laplace, Heat and Wave Equations. The method of characteristics, introduction to conservation laws, special solutions.

Prerequisite(s): MATH 518 and MATH 528 or consent of instructor.

MATH 572. Partial Differential Equations II**3 Credits (3)**

Sobolev spaces theory: basic definitions and properties, embedding theorems, weak solutions of boundary value problems and variational methods for partial differential equations.

Prerequisite(s): MATH 593 or consent of instructor.

MATH 581. Abstract Algebra II: Fields, Rings and Modules**3 Credits (3)**

Topics covered include field extensions; algebraic closure; polynomials rings; irreducibility criteria; Noetherian rings; algebraic sets; Nullstellensatz; modules; applications to linear algebra.

Prerequisite(s): MATH 526 or consent of instructor.

MATH 582. Module Theory and Homological Algebra**3 Credits (3)**

Introductory concepts of homological algebra, including projective, injective and flat modules; projective and injective resolutions; exactness of functors; homology of chain complexes; derived functors.

Prerequisite(s): MATH 581 or consent of instructor.

MATH 583. Introduction to Commutative Algebra and Algebraic Geometry**3 Credits (3)**

Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases.

Prerequisite(s): MATH 581 or consent of instructor.

MATH 593. Measure and Integration**3 Credits (3)**

Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.

Prerequisite: MATH 528 or consent of instructor.

MATH 594. Real Analysis**3 Credits (3)**

Differentiation, L_p spaces, Banach spaces, measure and topology, other selected topics.

Prerequisite: MATH 593.

MATH 595. Introduction to Functional Analysis**3 Credits (3)**

Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem.

Prerequisite(s): MATH 594, or consent of instructor.

MATH 599. Master's Thesis**1-15 Credits**

Thesis.

MATH 600. Doctoral Research**1-15 Credits**

Research.

MATH 698. Selected Topics**1-15 Credits**

Selected topics.

MATH 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

MGMT-MANAGEMENT

MGMT 2110. Principles of Management

3 Credits (3)

An introduction to the basic theory of management including the functions of planning, organizing, staffing, leading, and controlling; while considering management's ethical and social responsibilities.

Learning Outcomes

1. Explain the major functions of management including planning, organizing, communications, controlling, motivating, leading, and staffing.
2. Recognize major developments in the history of management thought.
3. Describe the basic managerial processes including decision-making and other key skills necessary for managers to perform their roles.
4. Identify an organization's stakeholders and the importance of social and ethical responsibility of managers.
5. Explain the formulation and implementation of strategic planning, including the relationship between goals, plans, vision statements, and mission statements.
6. Describe the strategies managers use to help organizations adapt to changing internal and external environments.
7. Explain organizational change, forces for change, sources of resistance to change, and the techniques managers can use to implement and facilitate change.

MGMT 309. Human Behavior in Organizations

3 Credits (3)

Interpersonal and organizational behavior, motivation, communication, team building, leadership, diversity management, legal and ethical issues, and politics in organizations. Credit may not be earned for both MGMT 309 and MGMT 315V.

MGMT 310V. Entrepreneurial Mindset

3 Credits (3)

This course provides the opportunity to learn to think like an entrepreneur in the broader context of social entrepreneurship, intrapreneurship, creative problem solving, opportunity recognition, and innovation.

MGMT 332. Human Resources Management

3 Credits (3)

Survey course in human resources management. Includes recruitment, selection, equal employment opportunity, performance appraisal, training, compensation, safety, and union-management relations.

MGMT 333. Training and Development

3 Credits (3)

Training and development of human resources, including training needs assessment, training approaches and techniques, and evaluation of training effectiveness.

MGMT 335V. Business and Government

3 Credits (3)

Crosslisted with: ECON 335G

MGMT 344. Production and Operations Management

3 Credits (3)

Management of physical and human resources; management information systems in operations; applications in various organizations.

Prerequisite: MATH 1350G or A ST 311; and BCIS 338 or BCIS 350.

MGMT 345V. Quality and Competitiveness: An International Perspective

3 Credits (3)

Quality management and competitiveness are studied in manufacturing, services, and the public sector with an international perspective. Topics include: global history of quality, foreign competition and its impact on quality and productivity, quality management and continuous improvement, international operations management, quality assessment, and a review of the emergence of quality and competitiveness in government, education and health care. May be repeated up to 3 credits.

Learning Outcomes

1. Developing critical thinking skills through challenging material and assignments.
2. Foster intelligent inquiry through assignments, participative lectures, team projects.
3. Develop an integration and synthesis of knowledge through applications to case studies and individual assignments.
4. Promote a breadth of knowledge on international developments in quality and competitiveness with a holistic view of quality and its impact on businesses, organizations, nations and individuals.

MGMT 347. Management Functions and Processes

3 Credits (3)

Planning, organizing, directing, and controlling operating units in an organization. Applications to a variety of types of organizations.

MGMT 351. Supply Chain Management

3 Credits (3)

Acquisition and control and delivery of materials, parts, equipment, and services for end use in the organization. Applications to service and manufacturing industries, nonprofit, and governmental institutions.

MGMT 361. Small Business Management

3 Credits (3)

Principles and practice of managing a small enterprise with emphasis on growth and performance.

MGMT 388V. Leadership and Ethics

3 Credits (3)

Exploration of the multifaceted nature of leadership and principal-based ethics in modern society through readings and seminar discussion. May be repeated up to 3 credits.

MGMT 391. Management Internship and Cooperative Education I

1-3 Credits

Application of management skills to the work environment. Open only to students majoring or minoring in management. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

Prerequisites: MGMT 309 and consent of instructor.

MGMT 448. Small Business Consulting

3 Credits (3)

Study analysis and presentation of recommendations for solving significant problems confronting small businesses.

Prerequisite(s): Senior standing or consent of instructor.

MGMT 449. Strategic Management

3 Credits (3)

Integrative approach to envisioning the future and shaping strategies for business success.

Prerequisite(s): BCIS 338 or BCIS 350; BLAW 316; BFIN 341; MGMT 309; MKTG 303; and one of the following: MGMT 344 or MGMT 470 or BCIS 485.

MGMT 451. Selection, Placement, and Performance Evaluation
3 Credits (3)

Staffing processes for organizations and the evaluation of employee performance. Use of selection methods and measurement of work behavior.

MGMT 453. Leadership and Motivation
3 Credits (3)

Theories of leadership and motivation. Motivational programs for complex organizations. Relationships between organizational power, authority, and management styles. Crosslisted with: I E 453

MGMT 454. Work Teams in Organizations
3 Credits (3)

Theories of small groups and their application to the work situation. Why and how groups form, grow, communicate, and maintain themselves.

Prerequisites: senior or above standing.

MGMT 458. Comparative International Management
3 Credits (3)

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior in multinational organizations and the management of human resources. Same as I B 458.

MGMT 460. Compensation Management
3 Credits (3)

An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration.

Prerequisite(s): MGMT 332 or consent of instructor.

MGMT 461. Seminar in Entrepreneurship
3 Credits (3)

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MKTG 461.

Prerequisite(s): Senior standing or consent of instructor.

MGMT 465. Contemporary Issues in Human Resources Management
3 Credits (3)

Integrative course in human resources management, emphasizing the application of advanced concepts to complex personnel cases.

Prerequisite: MGMT 332.

MGMT 470. Project Management in Organizations
3 Credits (3)

Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.

MGMT 490. Selected Topics
1-18 Credits (1-18)

Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.

MGMT 491. Management Internship and Cooperative Education II
1-3 Credits

Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.

Prerequisite: MGMT 309 and consent of instructor.

MGMT 498. Independent Study
1-3 Credits

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

MGMT 502. Operations Management
3 Credits (3)

Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources.

Prerequisite(s): Graduate students only.

MGMT 503. Organizational Behavior and Management Processes
3 Credits (3)

Covers the theory and practice related to the successful management of human resources in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory.

Prerequisite: graduate students only.

MGMT 512. Quantitative Analysis for Business Decisions
3 Credits (3)

Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making.

Prerequisite: graduate students only.

MGMT 548. Small Business Consulting
3 Credits (3)

Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGMT 448 with differentiated assignments for graduate students.

Prerequisite(s): Graduate standing.

MGMT 590. Strategic Management
3 Credits (3)

Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Restricted to majors.

Prerequisite: M.B.A. student in his or her final semester.

MGMT 591. Seminar in Entrepreneurship
3 Credits (3)

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.

Prerequisite(s): Graduate standing.

MGMT 598. Special Research Programs
1-3 Credits

Individual investigations either analytical or experimental. A maximum of 6 credits may be earned.

Prerequisite: consent of instructor.

MGMT 600. Doctoral Research
1-15 Credits (1-15)

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to management majors. May be repeated up to 88 credits.

MGMT 601. Research in Management**1 Credit (1)**

Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.

MGMT 640. Instructional Development for Teaching Business**3 Credits (3)**

Pedagogical issues and techniques in collegiate business education. Includes course and curriculum development, outcomes assessment, class management, and teaching techniques. Practical issues faced in college instruction. Restricted to doctoral students.

MGMT 645. Seminar in Human Resources Management**3 Credits (3)**

Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 650. Seminar in Organizational Behavior**3 Credits (3)**

Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

MGMT 655. Seminar in Organizational Systems and Theory**3 Credits (3)**

Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 660. Research Design and Methodology**3 Credits (3)**

Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

MGMT 661. Qualitative Research Methods**3 Credits (3)**

In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action research, and ethnomethodology. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 670. Seminar in Operations Management**3 Credits (3)**

Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology. Restricted to Doctoral students. May be repeated up to 3 credits.

MGMT 675. Seminar in Strategic Management**3 Credits (3)**

Survey of current and classical readings in strategy. Introduces the doctoral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 685. Story Consulting to Organizations**3 Credits (3)**

Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact) intervention with a local consenting organization. Restricted to doctoral students.

MGMT 690. Special Topics**3 Credits (3)**

Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students.

Prerequisite(s): Vary according to seminar being offered.

MGMT 698. Special Topics**1-3 Credits**

Prerequisite: consent of instructor.

MGMT 700. Doctoral Dissertation**1-15 Credits (1-15)**

May be repeated up to 88 credits.

Prerequisite: advancement to candidacy.

MKTG-MARKETING

MKTG 1210. Advertising**3 Credits (3)**

A survey of currently available advertising media. A psychological approach to consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures.

Prerequisite: MKTG 2110.

Learning Outcomes

1. Define advertising and the relevant application of psychology in delivering the message.
2. Explain the importance of various advertising media in the marketing mix.
3. Identify and explain the social, ethical and legal issues advertisers must consider.
4. Describe the significance of the marketing function in business.
5. Explain the importance of advertising and other marketing communication tools.
6. Demonstrate application of the planning process as it applies to marketing and advertising.
7. Describe the factors that are weighted when considering the use of radio and television in the creative advertising mix.
8. Describe the relationship between market segment, consumer behavior and selection of advertising campaign types.
9. List the alternative means of reaching a target market and the technical challenges of each.

MKTG 1220. Small Business Marketing**3 Credits (3)**

An overview of public relations principles, practices and purposes as applied to small business. Topics include basics of news release writing, media awareness, development and maintenance of a positive public image, branding, ethical marketing, and the relationships of public relations with advertising and marketing. Methods and practices used in small business are explored.

Prerequisite: MKTG 2110.

Learning Outcomes

1. Explain the importance of creating and sustaining a positive public awareness and image.
2. Identify public relations practices as they relate to the management and marketing processes.
3. Define branding and discuss its importance for small business.
4. Describe the value of business event management and promotion for small business.
5. Discuss how media relations, public relations, advertising and marketing efforts are interrelated and the importance of each.

MKTG 180. Level 1, PGA's PGM Education Program (Part 1)**3 Credits (3)**

Level 1 Part 1 of the PGA PGM Education Program. Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America. Students will complete the PGA Qualifying Level, Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), and the corresponding Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 181. Level 1, PGA's PGM Education Program (Part 2)**3 Credits (3)**

Level 1 Part 2 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 1, the corresponding PGA Work Experience Activities, and PGA Teaching Seminars. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

Learning Outcomes

1. Know how students learn and process golf knowledge and skills, and identify the implications for teaching
2. Know how to define and distinguish between learning and performance
3. Understand how juniors learn golf knowledge and skills, and identify implications for teaching
4. Conduct a physical evaluation of a junior golfer and create developmentally appropriate exercise and training programs
5. Establish student/teacher relationships that promote greater student learning and enjoyment
6. Develop a communication style that fits the student and increases instructional effectiveness
7. Analyze student's instructional needs and set clear, purposeful learning and practice goals
8. Know the format for an effective golf lesson
9. Deliver effective explanations and demonstrations during a golf lesson 1
10. Engage in self-assessment of teaching skills and competencies 1
11. Recognize the appropriate clubhead path and clubface position information to improve a golfer's performance 1
12. Conduct appropriate assessments to determine the short game skill level of the golfer 1
13. Gain understanding of the short game elements to help lower scores and improve the player 1
14. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Define what information is required to properly assess a player's golf equipment 1
15. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Observe a player's swinging motion, ball flight, and equipment to evaluate the effectiveness of their equipment

MKTG 2110. Principles of Marketing**3 Credits (3)**

Survey of modern marketing concepts and practices focusing on the marketing mix: product, pricing, promotion, and distribution strategies. Topics include: the marketing environment, consumer behavior, marketing research, target marketing, and the ethical and social responsibilities of marketers. May be repeated up to 6 credits.

Prerequisite: BUSA 1110.

Learning Outcomes

1. Describe the professional, ethical, and social responsibilities of marketers.
2. Explain the role of the product in the marketing mix, including the product life cycle, the relevance of product innovation, and product classifications.
3. Illustrate the role of promotion in the marketing mix, including the communication process and the promotional mix.
4. Explain the role of price in the marketing mix, including pricing objectives, pricing policies, and pricing methods.
5. Describe the operation of channels of distribution and supply chains, including functions of intermediaries and degrees of coverage.
6. Define the concepts of target markets and market segmentation with respect to elements of the marketing mix.
7. Explain the importance of market research and information systems in supporting marketing decision making.
8. Describe the dynamic environment(s) in which marketing decisions must be made.

MKTG 2220. Digital Marketing**3 Credits (3)**

This course focuses on planning to create and market a website. Internal marketing topics such as registering with search engines, increasing traffic, segmenting and targeting markets, establishing an online presence, developing a marketing plan and reshaping business for the Web market are covered.

Prerequisite: MKTG 2110.

Learning Outcomes

1. Describe how search engines work. (Use knowledge to make recommendations to a website on how it can improve its organic search rankings - perform search engine optimization).
2. Describe the various methods of online display advertising.
3. Determine the appropriate key performance indicators (KPIs) for any type of website.
4. Describe and implement best practices in marketing to a database of current and potential customers via email.
5. Utilize knowledge of social media tactics to design an effective social media campaign.
6. Implement online reputation management tactics to improve the online reputation of a brand.
7. Develop and present a digital marketing plan for a small, local business.

MKTG 280. Level 1, PGA's PGM Education Program (Part 3)**3 Credits (3)**

Level 1 Part 3 of the PGA PGM Education Program. This class will focus on Facility Management 1B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), Level 1 Checkpoint Exams, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 281. Level 2, PGA's PGM Education Program (Part 1)**3 Credits (3)**

Level 2 Part 1 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 2, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

Learning Outcomes

1. Explain how students learn golf knowledge and skills, and identify the implications for teaching
2. Explain how students process information when learning golf skills
3. Identify and explain the principles of effective practice
4. Explain how juniors learn golf knowledge and skills, and identify the implications for teaching
5. Structure an effective golf lesson
6. Analyze student's instructional needs and set clear, purposeful learning and practice goals
7. Deliver effective explanations and demonstrations during a golf lesson
8. Engage in self-assessment of teaching skills and competencies
9. Recognize and apply the appropriate clubhead path and clubface position information to improve a golfer's performance 1
10. Conduct appropriate assessments to determine the skill level of the golfer 1
11. Demonstrate basic knowledge of anatomy and physiology, and conduct a physical observation to identify movement capabilities and limitations that may affect a golfer's performance 1
12. Define club performance terms and specifications, and describe their effect on ball flight and player performance

MKTG 303. Principles of Marketing**3 Credits (3)**

Process, functions, and principles in the current marketing system.

Learning Outcomes

1. Understand primary and changing perspectives on marketing and strategic management.
2. Understand the fundamental principles and theories of marketing.
3. Develop the capacity to obtain and process relevant information and analytical skills.
4. Evaluate the impact of interactive media on marketing management.
5. Apply relevant marketing concepts and analytical tools, identify viable alternatives, make informed choices, and recommend marketing implementation plans.
6. Develop skills in organizing more effective strategic marketing and in implementing the market planning process.
7. Develop, evaluate, and implement marketing management strategies in complex environments through recent, popular case study analyses.
8. Formulate marketing management strategies on critical issues, problems, and business opportunities.
9. Broaden perspectives of ethics and social responsibility, keep abreast of global developments, and adapt to changing environments.

MKTG 305. Marketing and Food Agricultural Products**3 Credits (3)**

This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. May be repeated up to 3 credits.

Crosslisted with: AEEC 305.

Prerequisite(s): ECON 1110G or ECON 2120G.

Learning Outcomes

1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations
4. Know the basic outline and components of a marketing plan

MKTG 310. Marketing Research**3 Credits (3)**

Design, collection analysis, and presentation of research data.

Prerequisites: MATH 1350G or A ST 311, and MKTG 303, or consent of instructor.

Learning Outcomes

1. Translate a marketing problem into a feasible research question.
2. Recognize marketing research as a process that involves a sequence of activities, each compatible with the preceding activities.
3. Compare and contrast alternative research designs.
4. Identify the sources of marketing information and the various means for gathering such information.
5. Recognize the biases and limitations of marketing data and basic data analysis.
6. Interpret univariate and basic bivariate data analysis techniques (i.e., should be able to decide when a technique is appropriate and recognize the managerial implications of analytical results).
7. Design and execute a basic survey research project.
8. Assess ethical issues associated with various research approaches.

MKTG 311V. Consumer Behavior**3 Credits (3)**

The different aspects of consumer behavior and the variables affecting consumer decisions. Analysis of current concepts and models.

Learning Outcomes

1. Know the consumer behavior concepts by integrating and adapting theories developed in disciplines such as psychology, sociology, anthropology, and economics.
2. Use specific tools to tackle and analyze customer issues.
3. Develop the ability to apply consumer behavior concepts from the perspective of marketing managers and public policy makers.
4. Increase the awareness of and enhance the ability to make ethical decisions in consumer-related issues.

MKTG 312. Personal Selling**3 Credits (3)**

Implementation of the promotion process through interpersonal communications between salesperson and prospects. Serving customers by sales representatives.

Learning Outcomes

1. Demonstrate how personal selling can strategically enhance interpersonal communication skills, career management, personal productivity.
2. Identify key issues and trends such as opportunities or threats, for evolving emerging sales approaches platforms.

MKTG 313. Retail Management**3 Credits (3)**

Investigates retail business operations and focuses on the strategic profit model, store location, layout, display, merchandising, operations, and personnel.

Learning Outcomes

1. Analyze the role of retailing in society and basic retailing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and retailing opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of retailing strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, packaging, pricing, product/service design, methods of delivery and the product life cycle
5. Relate the concepts of marketing and retailing research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action

MKTG 314. Advertising Strategy**3 Credits (3)**

Utilization of advertising as a business administration function; communication with consumers as a means of attaining marketing goals.

Learning Outcomes

1. Analyze advertising from a consumer perspective
2. Compare advertising strategy theories and concepts
3. Evaluate advertising critically and creatively

MKTG 317. International Marketing**3 Credits (3)**

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as IB 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues.
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

MKTG 324. Product/Service Development**3 Credits (3)**

Covers product innovation, development, commercialization and resource recovery, price determination and administration strategies, and complementing planning processes.

Learning Outcomes

1. Understand the product/service development process.
2. Identify market opportunities for new products.
3. Use structured methods to evaluate and test product concepts.
4. Apply tools learned in class to develop new products/services.
5. Plan the launch of a product and evaluate its impact on the market.
6. Efficiently work with and communicate ideas to team members.

MKTG 354. Sports Marketing**3 Credits (3)**

The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.

Learning Outcomes

1. Discuss the domain of sports marketing
2. Apply basic marketing tools (e.g., research, segmentation) to sports marketing contexts
3. Recognize, evaluate, and accommodate the perspectives of participants and spectators as sports consumers
4. Identify appropriate marketing mix options for sports products
5. Appraise recent sports marketing trends
6. Plan a career in sports marketing

MKTG 357. Internet and Social Media Marketing**3 Credits (3)**

Focuses on the consumer psychology and marketing strategies at work in advertising and selling brands via the Internet and social media networks.

Learning Outcomes

1. Apply the concepts of the marketing mix to the formulation/evaluation of marketing strategies relative to Social Media policies that combine business objectives with appropriate use of Social Media channels and content.
2. Compare and contrast the history of Social Media and recognize the various platforms of Social Media.
3. Select/defend segmentation and target market selection relative to a specific population product/service that engages target audiences with a marketing message.
4. Analyze business objectives and connect to appropriate Social Media tactics.
5. Evaluate Social Media marketing content to shape the way we connect to and build relationships with users, consumers and businesses.
6. Relate the concepts of marketing research to establish metrics for measuring Social Media marketing success.

MKTG 380. Level 2, PGA's PGM Education Program (Part 2)**3 Credits (3)**

Level 2 Part 2 of the PGA PGM Education Program. This class will focus on Facility Management 2 and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Define the business at the facility level in terms of vision, core values, facility characteristics and mission.
2. Utilize the four Interaction Strategies in a variety of routine and challenging customer situations.
3. Identify core business areas that support a customer-focused environment
4. Know the characteristics of a merchandising operation that align with a facility's business plan
5. Understand how to define, assess, and develop tournament business at a facility.

MKTG 381. Level 3, PGA's PGM Education Program (Part 1)**3 Credits (3)**

Level 3 Part 1 of the PGA's PGM Education Program. This class will focus on Teaching and Coaching 3, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management

Learning Outcomes

1. Explain how various types of feedback function to influence learning
2. Define the major variables that influence learning and explain how they operate with implications for practice, learning, and teaching
3. Provide effective instructional feedback after students' practice and performance
4. Explain how the form, precision, timing, frequency, and regulation of augmented feedback influence learning with implications for teaching and practice conditions
5. Explain how the key practice factors influence learning with implication for designing practice conditions
6. Establish relationships that promote greater student learning and enjoyment
7. Plan long-term developmental programs for beginning and intermediate players
8. Communicate effectively with students
9. Develop a communication style that increases instructional effectiveness 1
10. Effectively determine and design an appropriate practice routine to the benefit of the golfer 1
11. Effectively determine and assign the appropriate drill or drill with an aid to improve the swing shape of the golfer 1
12. Use relevant technology to promote student learning 1
13. Effectively demonstrate and apply the appropriate specialty shot information to the benefit of the golfer 1
14. Demonstrate basic knowledge of current swing methodologies of noted instructors 1
15. Physical development of junior golfers 1
16. Assess the physical capabilities of adult golfer, describe implications for performance, and provide potential physical adjustments 1
17. Describe how to use bench skills, tools, and technologies for measuring and altering club performance 1
18. Perform analyses and make appropriate alterations to change ball flight, players performance, and teacher effectiveness

MKTG 400. Marketing Internship/Field Experience**3 Credits (3)**

Internship of field experience in application of marketing principles. The student must accept an internship before being allowed to enroll in the course. Consent of instructor required. Restricted to MKTG majors.

MKTG 449. Promotion Management**3 Credits (3)**

Covers concepts and problems in the use of advertising, internet marketing, social media marketing, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.

Learning Outcomes

1. Analyze the role of advertising and promotion in society and basic marketing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and promotional opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of promotional strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, pricing, product/service design, and e-commerce
5. Relate the concepts of marketing and advertising research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action in the promotional environment

MKTG 451. Food and Agribusiness Market Assessment**3 Credits (3)**

This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: AEEC 451.

Prerequisite(s): AEEC 305 or MKTG 305 or consent of instructor.

Learning Outcomes

1. Identify, organize and conduct market research specific to the project
2. Develop an understanding of primary and secondary research collection and analysis
3. Exhibit enhanced relationship management, communication skills, and team building
4. Develop written communication with final deliverable for implementation into the business world

MKTG 453. Sales Management**3 Credits (3)**

The nature of the sales management function in industry. Focuses on intra and interdepartmental sales management activities.

Prerequisite: MKTG 312.

Learning Outcomes

1. Examined the linkage between personal selling, as a basket of activities, and the management of those marketing personnel who do selling (i.e., salespeople).
2. Examined the role of the sales force in the achievement of a firm's marketing objectives.
3. Undertaken numerous case-based analyses of typical sales management issues, including the hiring, firing, training, motivation, compensation, deployment, and evaluation of the firm's sales personnel.
4. Developed decision-making skills and analytic capabilities in the development and management of both sales programs and salespeople.

MKTG 461. Seminar in Entrepreneurship**3 Credits (3)**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Crosslisted with: MGMT 461.

Prerequisite(s): Senior standing or consent of instructor.

MKTG 462. Advanced Sales**3 Credits (3)**

Advanced instruction and skill development in interpersonal communication skills to broaden understanding of the professional sales role (especially in team selling situation), career management, personal productivity, negotiation, and coordination with other functional areas.

Prerequisite: MKTG 312.

Learning Outcomes

1. Students will learn "how" to sell (i.e., the behaviors and planning associated with selling today).
2. Analyze the concept of what/how is perhaps equally important but not nearly as obvious, how and why buyers "buy".
3. The course focus will be particularly on so-called "business-to-business" (B2B) sales jobs, as that is where many of the most interesting – and lucrative – sales positions reside.

MKTG 480. Level 3, PGA's PGM Education Program (Part 2)**3 Credits (3)**

Level 3 Part 2 of the PGA's PGM Education Program. This class will focus on Facility Management 3, the Business Simulation Seminars, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management Majors

Learning Outcomes

1. Assess the current state of the business by conducting a SWOT Analysis
2. Describe the golf industry job market and the knowledge and skills required to succeed
3. Identify areas where food services and golf operations should coordinate efforts
4. Determine golf car needs in order to acquire a fleet that supports the facility's mission, customers, and physical characteristics
5. Describe the organizational structure, key departments, reporting relationships, and job descriptions of a facility
6. Utilize industry-proven pricing strategies to meet business objectives
7. Describe the Performance System for supervising and delegating
8. Describe practices that improve the golf course and protect the environment

MKTG 481. PGA Golf Management Final Experience**1 Credit (1)**

The following are requirements for successful completion of this senior level PGA Golf Management capstone course: 16 months of internship, completion of the Qualifying Level, Level 1, Level 2, and Level 3 of the PGA's PGM Education Program and successful completion of the PGA's Playing Ability Test. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Describe the golf industry job market and the knowledge and skills required to succeed
2. Access PGA employment resources and participate in professional growth and development

MKTG 489. Strategy and Policy**3 Credits (3)**

Techniques and analysis of marketing strategy and policy planning and formulation. Senior standing or consent of instructor.

Prerequisite(s): MKTG 310.

Learning Outcomes

1. Relate marketing strategy to the environmental constraints and opportunities with which managers must deal
2. Compare marketing strategy theories and concepts
3. Evaluate appropriate strategic marketing decisions in various situations

MKTG 490. Selected Topics**1-18 Credits (1-18)**

Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.

MKTG 498. Independent Study**1-3 Credits**

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

MKTG 503. Marketing Management**3 Credits (3)**

Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions.

Learning Outcomes

1. Identify the fundamental principles and theories of marketing
2. Outline primary and changing perspectives on marketing and strategic management
3. Apply relevant marketing concepts and analytical tools
4. Develop capacity to obtain and process relevant information with enhanced analytical skills
5. Identify viable alternative to make informed choices and recommend marketing implementation plans
6. Evaluate the impact of interactive media on marketing management
7. Develop skills in organizing more effective strategic marketing and implementing the market planning process
8. Practice implementing marketing management strategies in complex environments through case study analyses
9. Formulate marketing management strategies on critical issues, problems, and business opportunities 1
10. Synthesize perspectives of ethics and social responsibility in adapting to changing environments

MKTG 591. Seminar in Entrepreneurship**3 Credits (3)**

For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGMT 591.

Prerequisite(s): Graduate standing.

MKTG 601. Marketing Management**3 Credits (3)**

Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.

Learning Outcomes

1. Identify the contemporary principles and theories of marketing strategy research
2. Outline primary guidelines and trendy directions of marketing strategic research
3. Improve theoretical foundation for research development in marketing strategy
4. Develop capacity of analytical and quantitative skills required for empirics
5. Apply relevant marketing theories, concepts and analytical methodology in research development
6. Formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena
7. Practice complex research design, theoretical development and empirical operationalization
8. Synthesize perspectives of ethics and social responsibility in scholarly research

MKTG 620. Contemporary Marketing Readings**3 Credits (3)**

Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to apply theory that they have learned to the process of doing research.

MKTG 625. Consumer Behavior**3 Credits (3)**

Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary issues relevant to the study of marketing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to develop theories and frameworks.
2. Students will be able to discuss the latest research topics related to consumer behavior.
3. Students will be able to generate research ideas (interesting questions about consumer behavior and research hypotheses).
4. Students will be able to design experiments to test their research ideas and hypotheses.

MKTG 640. Measurement and Structural Equation Modeling**3 Credits (3)**

Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. May be repeated up to 3 credits.

Prerequisite(s): A ST 505.

MKTG 670. Marketing Theory**3 Credits (3)**

The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to identify the contemporary principles and theories of marketing strategy research.
2. Students will be able to outline primary guidelines and trendy directions of marketing strategic research.
3. Students will be able to improve theoretical foundation for research development in marketing strategy.
4. Students will be able to develop capacity of analytical and quantitative skills required for empirics.
5. Students will be able to apply relevant marketing theories, concepts and analytical methodology in research development.
6. Students will be able to formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena.
7. Students will be able to implement complex research design, theoretical development, and empirical operationalization.
8. Students will be able to synthesize perspectives of ethics and social responsibility in scholarly research.

MKTG 690. Special Topics in Marketing**3 Credits (3)**

A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.

MKTG 698. Selected Topics**1-9 Credits (1-9)**

Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.

MKTG 700. Doctoral Dissertation**1-15 Credits (1-15)**

May be repeated up to 88 credits.

Prerequisite: advancement to candidacy.

MOLB-MOLECULAR BIOLOGY

MOLB 448. Special Research Problems**1-3 Credits**

Individual investigation, theoretical or experimental, under the supervision of a molecular biology faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

MOLB 520. Molecular Cell Biology**3 Credits (3)**

Same as BIOL 520.

MOLB 542. Biochemistry I**3 Credits (3)**

Same as BCHE 542. B or better required.

MOLB 545. Molecular and Biochemical Genetics**3 Credits (3)**

Same as BCHE 545 and BIOL 545.

MOLB 546. Biochemistry II**3 Credits (3)**

Same as BCHE 546.

MOLB 550. Topics in Molecular Biology**1-3 Credits**

Selected topics of current interest in field of molecular biology for master's level students.

MOLB 590. Discussions in Molecular Biology**1 Credit (1)**

Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and three times for doctoral students. Graded by 2 options: S/U or Letter Grade

MOLB 597. Laboratory Rotations/Research Discussions**1-3 Credits**

All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.

MOLB 598. Special Research Programs**1-3 Credits**

Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.

MOLB 599. Master's Thesis**1-15 Credits (1-15)**

Experimental and scholarly research leading to the preparation of a master's thesis.

MOLB 600. Molecular Biology Research**1-15 Credits**

Laboratory research efforts prior to successful completion of doctoral comprehensive exam.

MOLB 650. Advanced Topics in Molecular Biology**1-3 Credits**

Discussions and lectures on topics of current interest in molecular biology for doctoral students.

MOLB 698. Advanced Research Projects**1-9 Credits**

Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.

MOLB 700. Doctoral Dissertation Research**1-15 Credits**

Research for doctoral students after completing comprehensive exams.

MUSC-MUSIC

MUSC 1110G. Music Appreciation: Jazz**3 Credits (3)**

This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Jazz from various cultures and times.

Learning Outcomes

1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1130G. Music Appreciation: Western Music**3 Credits (3)**

This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Western music from various cultures and times.

Learning Outcomes

1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1210. Fundamentals of Music for Non-majors**3 Credits (3)**

A beginning course in the fundamentals of music, this course includes notation, scales, key signatures and intervals. Aural comprehension is introduced through singing intervals, scales and triads and dictating simple rhythmic and melodic patterns and students explore the basic components of music. Traditional Grading with RR.

Learning Outcomes

1. Demonstrate and apply standard notation of pitch, rhythm, scales, intervals, key signatures, triads, and simple melodic and harmonic composition
2. Develop and improve basic aural skills
3. Read musical notation
4. Improve and expand understanding of fundamental musical techniques and concepts

MUSC 1310. Recital Attendance**0.5 Credits (.5+1P)**

This course is for music students to attend and participate in a good number of convocation, concert, and recital performances, creating a wider appreciation for the performing arts. May be repeated up to 4 credits. Restricted to: Music and Music Education majors. S/U Grading with RR. Restricted to Las Cruces campus only.

Learning Outcomes

1. Encourage student observation of serious music
2. Provide opportunities for public performances
3. To create a greater sense of community within the student body

MUSC 1410. Introduction to Music Education**2 Credits (2)**

This course is an overview of teaching in the music classroom through readings and observations. Students will be introduced to the skills needed to become a reflective educator, develop observation techniques, and demonstrate knowledge of the current state of the profession. Restricted to Las Cruces campus only.

Learning Outcomes

1. Make observations and analyze the current state of musical education in public schools
2. Describe characteristics of good teaching in music
3. Articulate a personal philosophy of music education
4. Reflect on personal strengths and weaknesses as a teacher of music

MUSC 1440. Class Voice I**1 Credit (1)**

Group instruction in voice and vocal pedagogy for instrumental Music Education majors, offering basic principles of healthy vocal production with particular attention to diction, development of vocal range, and the ability to impart that knowledge to elementary, junior and/or high school age students. Restricted to: Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Learning Outcomes

1. Provide the basic understanding of healthy vocal production. Including, but is not limited to, the following topics: Expanding vocal range; Learning how to practice and learn songs effectively and efficiently; Provide basic understanding of vocal pedagogy; Introduction to diction
2. Aims to equip students with the ability to impart that knowledge to elementary, junior and/or high school age students.

MUSC 1450. Ear Training I**1 Credit (1)**

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Traditional Grading with RR. Restricted to Las Cruces campus only.

Prerequisite(s): Passing the Theory Placement exam or making a C or better in MUSC 1210.

Learning Outcomes

1. Counting rhythms at sight using the Eastman Counting System
2. Singing melodies at sight using solfege syllables
3. Writing out rhythmic patterns
4. Writing out melodic patterns
5. Identifying and singing intervals
6. Identifying and singing chord / triad qualities

MUSC 1451. Ear Training II**1 Credit (1)**

To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C- or better in MUSC 1450.

Learning Outcomes

1. Counting rhythms at sight using the Eastman Counting System
2. Singing melodies at sight using solfege syllables
3. Writing out rhythmic patterns
4. Writing out melodic patterns
5. Identifying and singing intervals
6. Identifying and singing chord / triad qualities

MUSC 1460. Music Theory I**3 Credits (3)**

Introduction to vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis.

Prerequisite(s): Passing the Theory Placement exam or making a C or better in MUSC 1210.

Learning Outcomes

1. To learn the vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis

MUSC 1461. Music Theory II**3 Credits (3)**

Expansion of vocabulary and syntax of 4-voice 18th c. chorale music through study, harmonic analysis, and part writing.

Prerequisite(s): Grade of C or better in MUSC 1460.

Learning Outcomes

1. To expand and apply the vocabulary and syntax of 4-voice, 18th c. chorale music through study, harmonic analysis, and part writing.

MUSC 1470. Functional Piano I**2 Credits (2)**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Learning Outcomes

1. 5 finger hand position in all keys
2. I-IV-I-V7-I cadences in all keys
3. One octave scales with hands together in C, G, D and F (major and minor)
4. Root position cross-over triads, solid and broken (major and minor)
5. Simple sight reading, harmonizing and transposition
6. Prepared pieces from the textbook
7. Simple improvisation
8. Play 2 simple vocal exercises
9. Identify intervals, key signatures and chords 1
10. Correct posture and hand position 1
11. Musical issues such as phrasing, slurs and dynamics 1
12. Good practice habits and techniques

MUSC 1471. Functional Piano II**2 Credits (2)**

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Prerequisite: MUSC 1470 or consent of instructor.

Learning Outcomes

1. Two octave scales with hands separate in C, G, D, A, E, B and F (major and minor)
2. I-IV-I-V-V7-I cadences in above mentioned keys in root position and 1st inversion
3. Simple sight reading, harmonization and transposition
4. Prepared pieces from the book
5. Simple improvisation
6. Identify intervals, key signatures and chords
7. Correct posture and hand position
8. Musical issues such as phrasing, slurs and dynamics
9. Good practice habits and techniques

MUSC 1472. Functional Piano III**2 Credits (2)**

For music majors preparing for the Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Prerequisite: MUSC 1471 or consent of instructor.

Learning Outcomes

1. Keys learned in previous semesters, adding F# and C# (D flat)
2. Secondary dominant chords added to cadence patterns
3. Two-octave, , root position arpeggios, major and minor
4. Intro to chord charts, harmonization
5. More difficult sight-reading and transpositions
6. More difficult prepared pieces
7. Accompany a piece for any instrument on the Mid-Term Recital (required)

MUSC 1992. Applied Music**1-2 Credits (1-2)**

Private or group instruction for non-music majors, secondary instruments, and music majors preparing for 2000-level applied music. May be taken for unlimited credit. May be repeated up to 99 credits.

Learning Outcomes

1. Development of Musical Abilities.
2. Development of Technical Abilities.

MUSC 2110. Chamber Ensemble**1 Credit (1)**

This course is an exploration of chamber ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of chamber ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 16 credits. Restricted to Las Cruces campus only.

Prerequisite(s): by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2120. Major Ensemble**1 Credit (1)**

This course is an exploration of major ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of major ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 24 credits.

Prerequisite: by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2130. Jazz Ensemble**1 Credit (1)**

This course is an exploration of jazz ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of jazz ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

Prerequisite(s): By audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage
6. Develop and improve improvisation skills

MUSC 2132. Percussion Ensemble**1 Credit (1)**

Study and performance of contemporary percussion ensemble literature. May be repeated up to 5 credits. Restricted to Las Cruces campus only.

Prerequisite(s): by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

**MUSC 2151. An Introduction to World Music, Jazz and Music Research
3 Credits (3)**

Introduces world music and jazz within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works. A major component will be the development of effective research and scholarly writing skills for the music major or minor. May be repeated up to 3 credits. Restricted to: Music majors and minors. Restricted to Las Cruces campus only.

Learning Outcomes

1. This course will cover fundamental concepts and styles associated with world music (ethnomusicology), jazz and popular music, an overview of the Western European tradition, and an intense focus on research and writing about music.
2. Emphasis will be placed on writing skills as they apply to the college experience in general and the world of music education and performance in particular.
3. Students will become acquainted with the diverse ways cultures create and are affected by their respective musical arts.
4. Focus will be on style evolution, forms, genres, composers, literature, and, where appropriate, performers

**MUSC 2210. Diction I
2 Credits (2)**

This course is designed to prepare students for singing in multiple languages using concepts of the International Phonetic Alphabet. Students will work to master the basics of phonetic singing to improve their overall musical abilities. Restricted to Las Cruces campus only.

Learning Outcomes

1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing
5. Gain fluency, accuracy, and confidence in pronunciation of sung text

**MUSC 2220. Diction II
2 Credits (2)**

This course serves as a continuing study in the concepts of the International Phonetic Alphabet. Students will continue to improve and practice their diction to develop their singing and musical abilities in order to begin the mastery of lyric diction. Restricted to music majors. Restricted to Las Cruces campus only.

Prerequisite: MUSC 2210 or consent of instructor.

Learning Outcomes

1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing.
5. Gain fluency, accuracy, and confidence in pronunciation of sung text.
6. Demonstrate ability to notate song texts according to IPA standards

**MUSC 2240. Music History and Literature: Antiquity through Baroque
3 Credits (3)**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from antiquity through the end of the Baroque era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: M ED, MUSC majors.

Prerequisite(s): A grade of C- or better in MUSC 1450, 1460, and 2151.

Learning Outcomes

1. The purpose of the course is to survey the beginning history of music from the earliest ancient times through the Baroque period, ca. 175

MUSC 2310. Sound and Music Technology

1 Credit (1)

This course serves as an overview of current technologies and principles for the recording and production of sound, and the use of computer-based technologies for the production of music. Restricted to: MUSC, M ED majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Prerequisite(s): MUSC 1460.

Learning Outcomes

1. Demonstrate fundamental knowledge of techniques and practices of music recording and production
2. Demonstrate ability to properly use computer-based technologies to produce and record music
3. Demonstrate ability to create music recordings
4. Work with a variety of recording, production, and sound reinforcement tools
5. Apply basic and mixed editing techniques
6. Use audio editing and file management techniques
7. Demonstrate knowledge of music technology vocabulary
8. Explain and understand the development of various music technologies

MUSC 2451. Ear Training III

1 Credit (1)

Continuation of MUSC 1451, advanced sight singing, dictation. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C- or better in MUSC 1451.

Learning Outcomes

1. Count rhythms at sight using the Eastman Counting System
2. Sing melodies at sight and prepared using Solfege syllables
3. Write out rhythmic patterns
4. Write out melodic patterns
5. Identify and singing intervals
6. Identify and sing chord / triad qualities
7. Write out harmonic dictation

MUSC 2452. Ear Training IV**1 Credit (1)**

Continuation of MUS 2451, advanced sight singing, dictation. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C or better in MUSC 2451 and MUSC 2460.

Learning Outcomes

1. Count rhythms at sight using the Eastman Counting System
2. Sing scales and sequences as assigned for the level
3. Sing melodies at sight using solfege syllables
4. Write out rhythmic patterns in both simple and compound meters
5. Write out melodic patterns in both major and minor tonalities
6. Identify, label and sing intervals
7. Identify, label and sing chords and extended harmonic qualities, i.e. V7 and inversions
8. Write out harmonic progressions in both two and four part forms including secondary dominants and modulations.
9. Accurately detect melodic and rhythmic errors in dictation examples.

MUSC 2460. Music Theory III**3 Credits (3)**

Analysis of Baroque and Classical Music. Vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C or better in MUSC 1461.

Learning Outcomes

1. To learn and apply the vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition.
2. Topics covered include: Two-Voice Eighteenth Century Counterpoint; Fugue; Borrowed Chords; Neapolitan 6th Chords; Augmented 6th Chords; Sonata Form; Rondo Form.

MUSC 2461. Music Theory IV**3 Credits (3)**

Analysis of Romantic, Post-Romantic, Impressionist, and Twelve-Tone Music. Vocabulary and syntax of late 19th and early 20th c. Western art music through study, micro/macro analysis, and composition. Restricted to Las Cruces campus only.

Prerequisite(s): Grade of C or better in MUSC 2460.

Learning Outcomes

1. To learn and apply the vocabulary and syntax of late 19th and early 20th c. music through study, micro/macro analysis, and composition.

MUSC 2470. Functional Piano IV**2 Credits (2)**

For music majors preparing for Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option. May be repeated up to 99 credits.

Prerequisite: MUSC 1472 or consent of instructor.

Learning Outcomes

1. Keys learned in previous semesters, adding A flat, E flat, and B flat
2. Secondary dominant chords added to cadence patterns, all inversions
3. Arpeggios, all inversions
4. More difficult sight-reading and transpositions
5. More difficult prepared pieces
6. Four part pieces (hymns)
7. Accompany a piece for any instrument on the Mid-Term Recital (required) Score reading and transposition

MUSC 2510. Applied Music I**1-4 Credits**

Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required.

Restricted to: Music and Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Prerequisite(s): Audition.

Learning Outcomes

1. Varies

MUSC 2740. Pride Marching Band**1 Credit (1)**

The Pride Marching Band performs at all NMSU home football games and select away games. The marching band is open to all students at NMSU and supports both instrumental and visual units. May be repeated up to 8 credits.

Learning Outcomes

1. To cultivate within the student a value system that encourages community service.
2. To provide the performer with experiences that will enable them to communicate thoughts/ideas/emotions in a unique and personal manner using his/her instrument, body, and physical motion.
3. To instill in students a commitment to life-long learning.
4. To promote personal growth through the rehearsal and performance of music, choreography, and drill of high quality.
5. To encourage students to continuously participate in and support artistic performances following graduation.

MUSC 2993. Opera Workshop**1 Credit (1)**

Study, translation, analysis, rehearsal and performance of opera. May be repeated up to 10 credits. Restricted to Las Cruces campus only.

Prerequisite(s): by audition only.

Learning Outcomes

1. Varies

MUSC 2996. Special Topics I**1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

Learning Outcomes

1. Varies

MUSC 301. Marching Band Techniques**2 Credits (2)**

This course will help students develop the techniques needed to administer and teach all aspects of a contemporary high school marching band. This includes drill conception and design, instruction, organization, and administration. Stylistic varieties of marching fundamentals, show conception, fundamentals of charting and teaching drill, computer-aided drill design, traditional show design, contemporary show design, rehearsal techniques, and organizational concepts. Restricted to: Music, Music Education majors. Traditional Grading with RR.

**MUSC 302. Music History and Literature: Classic through Romantic
3 Credits (3)**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginnings of the Classic era through the end of the Romantic era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: Music Majors and Minors majors.

Prerequisite(s): A grade of C- or better in MUSC 2240.

**MUSC 303. Music History and Literature: 20th Century Through the Present
3 Credits (3)**

Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginning of the 20th Century through the Present. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: MUS minors and majors.

Prerequisite(s): A grade of C- or better in MUSC 302.

MUSC 315. Brass Techniques I**1 Credit (1)**

Methods and techniques of teaching high brass instruments, for music education majors. Main campus only.

MUSC 316. Brass Techniques II**1 Credit (1)**

Methods and techniques of teaching low brass instruments, for music education majors. Main campus only.

MUSC 317. Woodwind Techniques I**1 Credit (1)**

Methods and techniques of teaching high woodwind instruments, for music education majors. Main campus only.

MUSC 318. Woodwind Techniques II**1 Credit (1)**

Methods and techniques of teaching saxophone and double reed instruments, for music education majors. Main campus only.

MUSC 319. String Techniques I**1 Credit (1)**

Methods and techniques of teaching low string instruments, for music education majors. Main campus only.

**MUSC 321. Instrumental Techniques for Vocal Music Education Majors
2 Credits (2)**

Methods of teaching brass, woodwind, percussion, stringed and fretted instruments for vocal music education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 322. Guitar Methods**1 Credit (1)**

Methods and techniques of teaching guitar, for Music Education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 323. Percussion Technique I**1 Credit (1)**

Methods and techniques of teaching fundamental percussion instruments (snare drum, timpani, keyboards and essential accessories). May be repeated up to 1 credits. Restricted to: MUS,M ED majors.

MUSC 324. Percussion Technique II**1 Credit (1)**

Methods and techniques of teaching marching percussion, drum set, and a continuation of techniques discussed in MUS 323. May be repeated up to 1 credits. Restricted to: MUS,M ED majors. Traditional Grading with RR.

Prerequisite(s): A grade of C- or better in MUS 323.

MUSC 325. Beginning Conducting**1 Credit (1)**

A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning technique applicable to all ensembles. Reading of musical scores with application via laboratory ensemble experience is included. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 2452 and MUSC 2461.

MUSC 326. Instrumental Conducting**3 Credits (3)**

Will continue from MUSC 325 in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques as it relates to the instrumental ensemble. The class will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. May be repeated up to 3 credits. Restricted to: MUS,M ED majors. Traditional Grading with RR.

Prerequisite(s): A grade of C- or better in MUSC 325.

MUSC 327. Choral Conducting**3 Credits (3)**

Continuation of conducting study with emphasis on choral rehearsal techniques, ensemble management, and literature. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 325.

MUSC 330. Applied Music II**1-4 Credits**

Continuation from MUS 230. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 2992 plus a juried audition.

MUSC 340. Junior Recital**1 Credit (1)**

Public solo performance under the supervision of the appropriate applied instructor. 30 minutes of musical performance is required. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Corequisite(s): MUSC 330.

MUSC 341. BA Capstone**1-2 Credits (1-2)**

The objective of the Capstone course for the BA degree in Music is to demonstrate the accumulation, understanding and knowledge of the student's course of study. This will take the form of an analytical paper, recital, research paper, composition or other equally encompassing project approved by the Instructor of Record. This may involve coursework from the student's minor area of study and be a multi-disciplinary collaborative effort. Restricted to: Music majors.

Prerequisite(s): A B- or better in MUSC 2460 and MUSC 302.

MUSC 346. Elementary Music Methods**2 Credits (2)**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in an elementary school. Emphasis on methodology of Kodaly and Orff, teaching in a multicultural setting, and developing reflective practitioners. This course requires field experience in the public schools. Restricted to: Music Education majors.

Prerequisite(s): A grade of C or better in MUSC 1410 and passing the TEP exam.

MUSC 349. Secondary Music Methods**2 Credits (2)**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on teaching in a multicultural setting and developing reflective practitioners. Restricted to: Music Education majors.

Prerequisite(s): A grade of C or better in MUSC 346.

MUSC 350. Chamber Music**1 Credit (1)**

Small performing ensembles that may include strings, woodwinds, brass, pianos, percussion, and voices. May be repeated up to 16 credits.

Prerequisite(s): by audition only.

MUSC 351. Opera Workshop**1 Credit (1)**

Study, translation analysis, rehearsal and performance of opera. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 360. Special Topics II**1-3 Credits**

Emphasis on special areas of music; designed for highly motivated students. May be taken for unlimited credit.

MUSC 361. Concert Choir II**1 Credit (1)**

Composed of both music and nonmusic majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. Students must assume leadership role. May be repeated up to 88 credits.

Prerequisite(s): by audition only.

MUSC 362. Philharmonic Orchestra II**1 Credit (1)**

The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 363. Jazz Ensembles II**1 Credit (1)**

Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 365. Composition I**2 Credits (2)**

Significant forms for various media. Emphasis on structural aspects of original composition. May be repeated up to 2 credits.

Prerequisite: A grade of B or better in MUSC 1460.

Learning Outcomes

1. Demonstrate the ability to analyze a variety of musical compositions
2. Demonstrate the ability to develop musical compositions from basic melodic, harmonic, rhythmic, and formal structures
3. Create new musical compositions from variety of perspectives for smaller chamber ensembles

MUSC 368. University Singers II**1 Credit (1)**

Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits. Consent of Instructor required.

Prerequisite(s): by audition only.

MUSC 370. Wind Symphony II**1 Credit (1)**

This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 372. Marching Band II**1 Credit (1)**

Composed of both majors and nonmajors. Opportunity to perform all varieties of music in a contemporary style marching unit. May be repeated up to 5 credits. Consent of Instructor required. Traditional Grading with RR.

MUSC 374. Percussion Ensembles II**1 Credit (1)**

Study and performance of contemporary percussion ensemble literature. Students must assume a leadership role. May be repeated up to 5 credits.

Prerequisite(s): by audition only.

MUSC 380. Symphonic Band II**1 Credit (1)**

This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits.

Prerequisite(s): by audition only.

MUSC 386. Applied Music Pedagogy and Literature I**2 Credits (2)**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 390. Survey of Wind Literature**2 Credits (2)**

An examination of beginning to advanced literature for wind bands with an emphasis on the needs of middle and high school ensembles. It will include a means to determine the quality of a piece as well as the standardized level of difficulty (grading). Restricted to: Music and Music Education majors.

Prerequisite(s): A grade of C- or better in MUSC 2452 and MUSC 2461.

MUSC 391. Survey of Orchestral Literature**2 Credits (2)**

An examination of beginning to advanced literature for both string orchestra and symphony orchestra with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. May be repeated up to 2 credits.

Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.

Learning Outcomes

1. Identify significant composers and compositions that are appropriate for all grade levels and applicable to teaching music through a performance-based environment in an orchestral setting
2. Determine the quality of a work based on aesthetic ideals
3. Determine appropriate programming strategies and repertoire selection dependent upon level of difficulty and/or varying ability levels.

MUSC 392. Survey of Choral Literature**2 Credits (2)**

An examination of beginning to advanced literature for choir with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.

Prerequisite(s): A grade of C- or better in MUSC 2452 and MUSC 2461.

MUSC 393. Instructional Strategies I for Instrumentalists**2 Credits (2)**

An examination of beginning to advanced literature for instrumentalists with an emphasis on the needs of middle and high school ensembles.

The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills.

Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 394. Instructional Strategies II for Instrumentalists**2 Credits (2)**

The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students must also passing the TEP exam in order to enroll in this course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. The development of rehearsal techniques for middle and high school ensembles

MUSC 395. Instructional Strategies I for Vocalists**2 Credits (2)**

An examination of beginning to advanced literature for vocalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills. Students must also pass the TEP exam to enroll in this course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 396. Instructional Strategies II for Vocalists**2 Credits (2)**

The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students will also need to pass the TEP exam in order to enroll in the course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. The development of rehearsal techniques for middle and high school ensembles.

MUSC 397. Administrative Music Methods**1 Credit (1)**

Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on administration. Students must also pass the TEP exam to enroll in this course.

Prerequisite: A grade of C- or better in MUSC 1410.

Learning Outcomes

1. Gain insight and experience with administrative strategies and procedures in secondary classroom
2. Work on interview skills as well as resume and cover letter composition
3. Collect a set of usable tools that a student can carry with them into their first job.
4. Gain familiarity with laws and regulations regarding programs and money spent

MUSC 413. Form and Analysis**3 Credits (3)**

Forms in tonal music and basic analytic techniques including music from diverse cultures and media.

Prerequisite(s): A grade of C- or better in MUSC 2452 and MUSC 2461.

MUSC 415. Orchestration**3 Credits (3)**

Scoring for full orchestra and various instrumental combinations with consideration of instrument timbres, strengths, weaknesses and ranges. Restricted to: Music and Music Education majors.

Prerequisite(s): A grade of C or better in MUSC 2452 and MUSC 2461.

MUSC 417. Studio Accompanying**2 Credits (2)**

Practical application of collaborative piano skills in a studio setting for Piano Performance majors. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 421. Music of the Baroque Era**3 Credits (3)**

An overview of the music of the Baroque era with an emphasis on history and literature. May be repeated up to 3 credits.

Prerequisite: MUSC 303.

Learning Outcomes

1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 422. Music of the Classic Era**3 Credits (3)**

An overview of the music of the Classic era with an emphasis on history and literature.

Prerequisite(s): MUSC 303.

MUSC 424. Music of the Twentieth Century**3 Credits (3)**

An overview of the music of the Twentieth Century with an emphasis on history and literature. Consent of Instructor required.

Prerequisite(s): MUSC 303.

MUSC 429. Opera: History and Literature**3 Credits (3)**

An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: Music, Music Education majors.

Prerequisite(s): MUSC 303 or consent of instructor.

Learning Outcomes

1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 430. Applied Music III**1-4 Credits**

Continuation from MUS 330. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits.

Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Prerequisite(s): A grade of C or better in MUSC 330 plus a juried audition.

MUSC 440. Senior Recital**1-2 Credits (1-2)**

Public solo performance under the supervision of the appropriate applied instructor. 60 minutes of musical performance is required for enrollment of 2 hours credit. 30 minutes of musical performance is required for enrollment of 1 hour credit. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Corequisite(s): MUSC 430.

MUSC 441. Supervised Studio Teaching**2 Credits (2)**

Teaching of private lessons under supervision. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.

MUSC 450. Research Methods**3 Credits (3)**

Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Restricted to majors. Main campus only. No S/U option.

Prerequisite: consent of instructor.

MUSC 455. Music Business Internship**3 Credits (3)**

Capstone course for the Music Business degree. Working with the music business coordinator, students must have been accepted as an intern in a music business setting before enrolling. Credit given for the internship based on criteria developed for each placement. Restricted to majors. S/U only.

Prerequisites: MUSC 330 and piano proficiency.

MUSC 470. Special Topics III**1-3 Credits**

Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit.

MUSC 471. Graduate Theory Review**3 Credits (3)**

Comprehensive and accelerated study of modes, diatonic harmony, and classical form of the common practice period. Restricted to: Music majors. Traditional Grading with RR.

MUSC 475. Intermediate Conducting**3 Credits (3)**

Serves as a bridge from undergraduate conducting study to the graduate level. Advanced undergraduate students may enroll to learn how the graduate program in conducting functions. The course also serves as the introductory experience for newly admitted graduate conducting majors. After successful completion of this course, students will be able to: Study musical scores from a conducting perspective; Demonstrate effective predetermined gestures and movements; Lead an ensemble; Research and give presentations related to composers and their music; Demonstrate advanced knowledge of conducting practices.

Prerequisite(s): A grade of C- or better in MUSC 326 or MUSC 327.

MUSC 477. Graduate Music History Review**3 Credits (3)**

Comprehensive and accelerated study of music history from antiquity to the present. Restricted to: Music majors. Traditional Grading with RR.

MUSC 486. Applied Music Pedagogy and Literature II**2 Credits (2)**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music majors. Traditional Grading with RR.

MUSC 498. Independent Study**1-3 Credits**

For students with a strong musical background wishing to explore content beyond the traditional curriculum. Restricted to majors. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

MUSC 511. Survey of Traditional Harmony**3 Credits (3)**

Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Restricted to: Music majors. Traditional Grading with RR.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 513. Twentieth Century Art Music**3 Credits (3)**

Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school in historical context. Restricted to: Music majors.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 518. Seminar in Music Theory**3 Credits (3)**

Varying topics in Music Theory, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: Music majors. Traditional Grading with RR.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 519. Seminar in Music History**3 Credits (3)**

Varying topics in Music History, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 477.

MUSC 521. Music of the Baroque Era: History and Literature**3 Credits (3)**

An overview of the music of the Baroque Era with an emphasis on history and literature. May be repeated up to 3 credits.

Prerequisite: A grade of B or better in MUSC 477.

Learning Outcomes

1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 522. Music of the Classical Era: History and Literature**3 Credits (3)**

An overview of the music of the Classical era with an emphasis on history and literature. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 477.

MUSC 523. Music of the Romantic Era: History and Literature**3 Credits (3)**

An overview of Romantic era music, with an emphasis on history and literature. Restricted to MUS Majors. May be repeated up to 3 credits.

Prerequisite: A grade of B or better in MUSC 477.

Learning Outcomes

1. Develop an in depth knowledge of composers of the Romantic era
2. Develop the ability to Recognize Major compositions of the Romantic Era
3. Develop the ability to analyze works from the Romantic Era.

MUSC 529. Opera History and Literature**3 Credits (3)**

An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: M ED, MUS majors.

Prerequisite(s): A grade of B or better in MUSC 477.

Learning Outcomes

1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 530. Seminar in Music Education**3 Credits (3)**

Varying topics in Music Education, providing a more specific and in-depth study of the particular topic. Restricted to: MUS majors.

MUSC 531. Music Education in the Diverse Classroom**3 Credits (3)**

This course is designed to provide an introduction to diverse and at-risk student groups in educational settings in the music classroom. It will help the course participants explore strategies and gain skills to enhance the musical growth of marginalized groups of students. There is an emphasis on identification, behavioral patterns, building interpersonal relationships, and will include a critical review of selected current research studies in music education. Armed with this knowledge, course participants will be better prepared to understand at-risk students and how best to implement strategies in the classroom. May be repeated up to 3 credits. Restricted to: MUS majors.

Learning Outcomes

1. Students will access and utilize the basic research journals and other sources of research reports and summaries, including those identified using computer technology in the field of music education.
2. Students will describe the structure of most qualitative research studies and their aide in identifying student traits.
3. Students will understand and use most of the language, terms and vocabulary found in qualitative research reports in discussing and identifying behavioral patterns of at-risk students.
4. Students will appraise qualitative research in a systematic way; analyze and review what the research produced in order to isolate the strategies available to incorporate in classroom teaching scenarios.
5. Students will independently retrieve, critique and summarize research related to at-risk students in music education.

MUSC 535. Current Issues in Music Education**3 Credits (3)**

This course examines the rich and challenging complexities of music teaching and learning from a variety of perspectives. Educational theory to pedagogical inquiry of current educational practice will be examined, calling students to critically reflect on such professional activities as lesson planning, curriculum design, repertoire choice, program assessment, advocacy in the arts, and student evaluation. Restricted to: MUS (Music Ed track only) majors.

MUSC 540. Graduate Recital/Analytical Paper**4 Credits (4)**

This course is for students completing a Master of Music with a Performance emphasis. A public recital will be given and an accompanying research paper will be submitted. Restricted to: MUS majors.

MUSC 574. Advanced Choral Conducting I**3 Credits (3)**

This course will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 575. Advanced Choral Conducting II**3 Credits (3)**

This is the final course in preparation for the student's graduate conducting concert. It will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 574.

MUSC 576. Advanced Instrumental Conducting I**3 Credits (3)**

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 577. Advanced Instrumental Conducting II**3 Credits (3)**

The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 576.

MUSC 578. Advanced Choral Literature**2-3 Credits (2-3)**

An examination of significant choral works from 1200 to the present, including composers, genres, and historical context. May be repeated up to 3 credits. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 579. Advanced Instrumental Literature**2-3 Credits (2-3)**

An examination of significant instrumental works from the Baroque period to the present, including composers, genres, and historical context. May be repeated up to 3 credits. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 580. Ensemble Performance**1 Credit (1)**

Performance in university ensembles. May be repeated up to 99 credits.

Prerequisite(s): by audition only.

MUSC 582. Applied Music**2-4 Credits (2-4)**

For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. Students must audition in order to enroll. Consent of instructor required. May be repeated up to 24 credits.

Learning Outcomes

1. Develop of Musical Performance Attributes.
2. Development of technical Skills.
3. Development of Aural Skills.
4. Development of Musical Analytical Skills.
5. Development of Improvisatory Skills.

MUSC 586. Applied Music Pedagogy and Literature III**2 Credits (2)**

Methods, materials, problems, literature, and techniques in teaching individual lessons. Restricted to: MUS majors.

Prerequisite(s): A grade of B or better in MUSC 486.

MUSC 598. Special Research Programs**1-4 Credits**

May be taken for unlimited credit.

MUSC 599. Master's Thesis**15 Credits**

Thesis.

NA - NURSING ASSISTANT

NA 101. Nursing Assistant Theory and Lab

6 Credits (5+2P)

Nurse aide skills with emphasis on a bio-psychosocial-cultural approach to client care. Practice of these skills is provided in the laboratory as well as at a clinical site. Successful completion of the course prepares and qualifies the student to take the NACES certification examination. Requires a C or better to pass. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Apply theoretical knowledge associated with nursing assisting in providing basic healthcare services.
2. Perform essential clinical skills within the nursing assistant scope of practice in long-term, acute care, and ambulatory care settings.
3. Recognize factors that affect procedures and results, and take appropriate actions within predetermined limits when indicated, including resident/patient compromise or complications.
4. Demonstrate professional conduct and interpersonal communication skills with patients, other health care professionals, and with the public.
5. Recognize the responsibilities of other health care personnel and interact with them with respect for their healthcare roles and resident/patient care.
6. Apply basic scientific principles and evidenced-based practice in learning new techniques and procedures.
7. Relate vital signs, point-of-care testing, and physical psychological findings to common disease processes.
8. Evaluate occupational exposures, environmental safety hazards, high risk situations, and emergency responses related to health care professions.
9. Demonstrate soft skills related to assisting with patient assessment, mobility, safety, nutrition, and care of the environment. 1
10. Demonstrate professionalism when interacting with patient populations across the lifespan; including patient education and emergent situations. 1
11. Explain legal and ethical considerations, including HIPAA and scope of practice related to healthcare settings.

NA 102. Sterile Processing Technician

3 Credits (2+1P)

This course will prepare the student to work as a Sterile Processing Technician, performing critical functions that support both the hospital and Operating Room. The student will learn about infection control, instrument reprocessing, decontamination, disinfection, and sterilization. All critical aspects of sterile processing will be covered to include applicable standards and regulations. This field is constantly evolving and those desiring to work in this profession must ensure that they stay abreast of the science behind the discipline. Restricted to Community Colleges campuses.

Prerequisite: CCDE 110 N.

Learning Outcomes

1. Summarized the legal responsibilities, ethical standards, and safety practices related to Sterile Processing.
2. Control and eliminate the spread of microorganisms.
3. Articulate standards and regulations as well as recommendations by professional organizations.
4. Properly clean, decontaminate, disinfect, and sterilize basic surgical instrumentation.
5. Prepare and assemble surgical trays and kits to include packaging and quality assurance indicators.
6. Utilize various sterilization modalities.

NA 104. Nursing Assistant Fundamentals

3 Credits (3)

This course prepares students for employment as a Nursing Assistant in a Long Term Care Facility. Theory and basic nursing care skills will be taught with an emphasis being placed on the psychosocial-cultural approach to client care. Students will learn communication skills, basic anatomy and physiology, growth and development, infection control, body mechanics, basic nutrition, client/resident elimination needs, the client/resident unit, vital signs, range of motion exercises, bed making, rehabilitation and restorative care, client admission and discharge, common health problems, dealing with death and dying, and basic medical terminology. NA 104 and NA 104L (laboratory) must be successfully completed with a C- or better in order to continue to NA 105 Nursing Assistant Clinical. NA 105 must also be successfully completed with a C- or better to be eligible to take the state certification competency examination. Attendance is required to meet the federal requirements for training hours and content prior to direct contact with a patient/resident and the state competency examination. Students must test out of all CCDE and CCDD courses and eligible to take ENGL 1110G to enroll in this course. Restricted to Community Colleges campuses only.

Corequisite(s): NA 104 L.

NA 104 L. Nursing Assistant Fundamentals Lab

1 Credit (3P)

This course prepares students for employment as a Nursing Assistant in a Long Term Care Facility. Students will learn and demonstrate personal care skills including bathing, grooming, dressing, toileting, assisting with eating and hydration, skin care, transfers and positioning. Students will also learn and demonstrate the use of assistive devices, and how to maintain resident safety, dignity and privacy. NA 104 & NA 104L must be successfully completed with a C- or greater in order to continue to NA 105 Clinical. NA 105 must be successfully completed with a C- or greater to be eligible to take the state certification competency examination.

Prerequisite(s)/Corequisite(s): NA 104. Prerequisite(s): English COMPASS score of 35 or greater or CCDE 110N, and reading COMPASS score of 55 or greater or CCDD 105N. Restricted to Community Colleges campuses only.

NA 105. Nursing Assistant Clinicals**4 Credits (3+3P)**

Extension of basic fundamentals of personal care, including theory, skills and clinical experience leading to the certified Nursing Assistant Examination at the conclusion of the semester. Continuation of NA 104. Requires a C or better to pass. Restricted to: Community Colleges only.

Prerequisite(s): C or better in NA 104 or consent of instructor.

NA 109. Phlebotomist Basic**4 Credits (3+3P)**

This course provides the latest information, techniques, skills, and equipment for blood and specimen collection based on the standards of the Clinical and Laboratory Standards Institute, Needlestick Prevention Act, Joint Commission 2008 National Patient Safety Goals, OSHA and CDC. An advanced skills lab is included in the course to provide a "hands-on" practice experience and a 30 hour practicum in a supervised work environment collecting blood and specimens on actual patients for laboratory tests. Attendance is mandatory. Prepares students for employment as a phlebotomist in health care settings. Requires a "C" or better to pass. Upon successful completion of the course, student has the opportunity to test for National Healthcareer Certification. Consent of Instructor required. Restricted to Community Colleges campuses only. May be repeated up to 4 credits.

Prerequisite/Corequisite: BIOL 1130 or BIOL 2225.

Learning Outcomes

1. Students will demonstrate use of available resources and equipment pertinent to the role of a phlebotomist.
2. Students will employ concepts of medical asepsis and infection control.

NA 110. Electrocardiogram Technician Basic**4 Credits (3+2P)**

Prepares students for employment as an Electrocardiogram Technician. Includes basic theory of the cardiovascular system, cardiac rhythm interpretation, 12 lead ECG lead placement, and ECG equipment trouble shooting. The course includes an advanced skills laboratory for "hands-on" practice and 16 hours of supervised clinical in the work environment assisting with ECG testing. Attendance is mandatory. Course requires a grade of "C" or better to pass. Upon successful completion of course, student has the opportunity to test for National Healthcareer Certification. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Perform ECG's, including patient preparation, electrode placement, recording ECG's, mounting upload of ECG to patient's chart.
2. Calculate a patient's heart rate and identify the heart rhythm from an ECG tracing.
3. Identify artifacts; waveform elements of the cardiac cycle, including variances related to ischemia, injury or infarction; as well as, major classifications of arrhythmias.
4. Prepare and monitor patient's for Holter monitoring and telemetry.
5. Prepare, conduct and monitor patients during stress testing.
6. Recognize factors that affect procedures and results, and take appropriate actions within predetermined limits when indicated, including patient compromise or complications.
7. Demonstrate professional conduct and interpersonal communication skills with patients, other health care professionals, and with the public.
8. Recognize the responsibilities of other health care personnel and interact with them with respect for their jobs and patient care.
9. Apply basic scientific principles in learning new techniques and procedures.
10. Relate electrocardiogram findings to common disease processes.

NA 111. Alzheimer/Dementia Care Focus**3 Credits (3)**

Students will learn respectful care of Alzheimer/Dementia persons while ensuring their dignity, maximizing safe independence focusing on strengths and abilities.

Prerequisite(s)/Corequisite(s): NA 104 or NA 101. Restricted to: Community Colleges only.

NA 113. Sterile Processing Practicum**5 Credits (1+4P)**

This course will allow students to get hands on training in the Sterile Processing Department. They will perform critical functions learned in the Sterile Processing Technician course. They will apply principles of medical asepsis and infection control and by the end of the practicum be able to independently function in all work areas of the Sterile Processing Department. This field is constantly evolving and those desiring to work in this procession must ensure that they stay abreast of the science behind the discipline. Restricted to Community Colleges campuses

Prerequisite(s)/Corequisite(s): NA 102. Prerequisite(s): CCDE 110 N.

Learning Outcomes

1. Utilize equipment safely in the Sterile Processing Department
2. Apply concepts of infection control and medical asepsis
3. Effectively demonstrate professional ethical concepts
4. Demonstrate proper cleaning, decontamination, disinfection, and sterilization practices
5. Properly prepare and assemble surgical trays and kits to include packaging and quality assurance indicators
6. Validate sterilization loads to ensure patient safety

NA 115. Phlebotomist Technician**6 Credits (3+6P)**

Basic theory and skills of phlebotomy following OSHA and Center for Disease Control guidelines. Prepares students for the requirements of testing for the ASCP certification exam and employment in a healthcare organization as a phlebotomist in licensed settings. Laboratory hours include infection control skills & practice, patient assessment & teaching, and practice in venipuncture. Clinical time includes clinical laboratory processes and operations, patient assessment, venipuncture, and exposure to clinical policies and procedures. Upon successful completion students are workforce ready. Requires C or better to pass. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Collect and process biological specimens for analysis.
2. Recognize factors that affect procedures and results, and take appropriate actions within predetermined limits when corrections are indicated.
3. Monitor quality control within predetermined limits.
4. Perform preventative and corrective maintenance of equipment and instruments or refer to appropriate source for repairs.
5. Demonstrate professional conduct and interpersonal communication skills with patients, laboratory personnel, other health care professionals, and with the public.
6. Recognize the responsibilities of other laboratory and health care personnel and interact with them with respect for their jobs and patient care.
7. Apply basic scientific principles in learning new techniques and procedures.

NA 204. Patient Care Technician**4 Credits (3+3P)**

This course will prepare Certified Nursing Assistants (CNAs) to work in the acute care setting through an expansion of their existing basic skill set. Students will acquire expanded acute care skills, critical thinking skills, and knowledge in caring for patients of all ages. Currently CNA certified. Restricted to Community Colleges campuses only.

Prerequisite(s): (NA 104, NA 105, NA 109, NA 110, AHS 120, and (BIOL 1130 or (BIOL 2210 & BIOL 2225))).

Corequisite(s): NA 205.

NA 205. Patient Care Technicians Practicum**4 Credits (1+9P)**

This course will prepare Certified Nursing Assistants (CNAs) to work in the acute care setting through an expansion of their existing basic skill set. Students will acquire expanded acute care skills, critical thinking skills, and knowledge in caring for patients of all ages. Students will go to acute care settings to practice newly acquired skills. Must have a "C" or better to pass. Restricted to Community Colleges campuses only.

Prerequisite(s): (NA 104, NA 105, NA 109, NA 110, AHS 120, & (BIOL 1130 or (BIOL 2210 & BIOL 2225))) Currently CNA Certified.

Corequisite(s): NA 204.

NA 209. Phlebotomy Laboratory Technician**4 Credits (2+4P)**

A continuation of NA 109, Phlebotomy Basic. This course furthers the experience, knowledge and skills of the phlebotomist by providing advanced specimen collection techniques, skills to assist with lab management, patient data processing, quality control measures, and customer service. Completion of thirty clinical hours and fifty successful venipunctures are required. Attendance in mandatory. Requires a final grade of "C" or better to pass. Consent of Instructor required. Restricted to Community Colleges campuses

Prerequisite(s)/Corequisite(s): ENGL 1110G or ENGL 1110H or ENGL 1110M. Prerequisite(s): (BIOL 1130 or BIOL 2310 & BIOL 2225), and AHS 120, and NA 109.

Learning Outcomes

1. Students will learn and demonstrate advanced specimen collection techniques.
2. Students will learn and demonstrate advanced laboratory processing skills.
3. Students will effectively employ skills required for patient information processing.
4. Students will employ concepts of medical asepsis and infection control.
5. Students will apply knowledge and skills required for quality control measures in the laboratory setting.
6. Students will demonstrate professional and appropriate communication, in addition to soft skills.
7. Students will learn and practice blood collection techniques in preparation for the PBTASCP national certification exam.

NA 210. Administrative Procedures for Medical Assistants**4 Credits (4)**

This course will provides students with the administrative procedures needed for a medical assistant. Skills will include creating awelcoming environment, cultural considerations, office safety, opening and closing procedures, computer operation andmanagement, written and telephonic communications, financial procedures, patient scheduling, medical record management, andmedical insurance, billing, and coding. Restricted to Community Colleges campuses

Prerequisite(s)/Corequisite(s): NA 212. Prerequisite(s): MATH 1215, and ENGL 1110G, andAHS 120, and BIOL 1130 or BIOL 2225.

Learning Outcomes

1. Create and maintain a medical facility environment
2. Demonstrate professional business communications in writing, via telephone, and email.
3. Demonstrate patient scheduling, screening calls, and check-in.
4. Create a patient chart and demonstrate medical record management.
5. Demonstrate the use and management of an electronic health record.
6. Identify insurance and billing terminology.
7. Identify the different characteristics of third party medical payer sources.
8. Collect information for billing, and precertification for services.
9. Identify common procedure codes for diseases and procedures 1
10. Complete billing and coding forms. 1
11. Demonstrate office financial practices, managing patient accounts, and tracking, collecting payments, documentation, and performing banking procedures. 1
12. Performing inventory, and purchasing of supplies. 1
13. Identify billing and collection procedures. 1
14. Demonstrate office accounting practices. 1
15. Apply laboratory regulations for safety and quality in the medical laboratory 1
16. Identify legal considerations in the management of a medical office.

NA 212. Medical Assistant Capstone Course**6 Credits (6)**

This course provides the student with entry-level theory and limited "hands-on" training in basic and routine clinical office tasks. The course will equip the Medical Assistant (MA) student with the competencies required to perform in a medical office under the direct supervision of a physician. The graduate will be able to assist the physician with physical exams, ECGs, phlebotomy, and minor surgical procedures. CNA Certification within the last 5 years.

Prerequisite(s): NA 105, NA 110, NA 109, AHS 120, BIOL 1130, BOT 208, HIT 228, HIT 248.

NA 214. Medical Assistant Practicum**6 Credits (1+6P)**

This course is the practicum for NA 212 Medical Assistant Fundamentals Capstone Course. Students will prepare for a career as a medical assistant in medical offices and clinics. During practicum students will observe and participate in 180 hours in a supervised work environment using knowledge and skills learned in NA 212. This course includes weekly post-practicum conferences with the instructor. The student will be evaluated by both the employer and the instructor. Requires a "C" or better to pass. Upon successful completion the student may be eligible to test for National Certification. Students who have been CNA Certified within the last 5 years can use this to enroll into this course. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): NA 212. Prerequisite(s): NA 105, NA 110, NA 109, AHS 120, BIOL 1130, BOT 208, HIT 228, HIT 248. Restricted to Las Cruces campus only.

NATV-NATIVE AMERICAN STUDIES

NATV 1150G. Introduction to Native American Studies**3 Credits**

This course surveys the significance of Native American Studies through an inter-disciplinary approach to two areas of academic concentration: Indigenous Learning Communities, and Leadership and Building Native Nations.

Learning Outcomes

1. Students will develop a general understanding of the various concentration areas in Native American Studies throughout the United States.
2. Students will identify the contributions of various academic disciplines to Native American Studies.
3. Students will understand the intricacies and intersections of Indigenous scholarship in Native American Studies.
4. Students will articulate the importance of Native American Studies as a stand-alone discipline in academia.
5. Students will be able to connect community issues in both Native and Non-Native America to concepts taught in Native American Studies.

NATV 2120. Native American Experience**3 Credits (3)**

Introductory survey of Native American History, culture an contemporary issues. Students read literature by and about Native Americans covering a variety of topics including tribal sovereignty, federal policy, activism, economic development, education and community life.

Learning Outcomes

1. Apply cultural and historical context to text about Native Americans (by Natives and non-Natives).
2. Analyze texts about Native Americans in relation to tribal sovereignty, federal policy, activism, economic development, education and community life.
3. Evaluate texts by and about Native Americans from an NAS perspective.

NATV 3120. An Indigenous Peoples History of the United States 3 Credits (3)

This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.

Learning Outcomes

1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States.
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student is able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 4110. Native American Women

3 Credits (3)

Students investigate the status, experience, and contributions of Native American women from pre-contact to contemporary times. Identifying the contribution of Native American women to societies, communities, and Nations as keepers of knowledge, teachings, and traditions. Crosslisted with: ANTH 553.

Learning Outcomes

1. Explore and examine the roles of American Indian women within a tribal society and analyze the impact of colonization and decolonization upon their place / roles over time.
2. Evaluate historical and contemporary issues of importance to American Indian women and their communities.
3. Assess a topic, book or issue of importance to Native women through a research paper, case study, or exam demonstrating in-depth knowledge and understanding.
4. Demonstrate in-depth knowledge and understanding of Native American women histories and contemporary issues.
5. Formulate a paper on Native woman/tribal women from historical or contemporary sources and share with class (undergraduates).
6. Demonstrate in-depth knowledge and understanding of Native American women through an exam/final (undergraduates).

NATV 4120V. Native American Visual Culture

3 Credits (3)

This course examines the various theoretical and methodological challenges inherent to the study of indigenous art, including the issues of identity, sovereignty, gender, cultural critique, and the role of the artist.

Learning Outcomes

1. Identify NA / Indigenous, film/video writers and directors.
2. Locate NA / Indigenous nations with their geo-physical location.
3. Consider issues of identity concerning Indigenous population.
4. Apply "colonizing" / "decolonizing" methodologies.
5. To practice writing short analytical journal entries.
6. To learn effective group discussion techniques

NATV 4130. Indigenous Ways of Knowing 3 Credits (3)

This course examines Indigenous knowledge and ways of knowing to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. The course explores and analyzes the nature and ways that Native Americans' develop knowledge as well as the concepts and composition of metaphysics and cosmology. Students analyze knowledge development through mythology and storytelling by emphasizing the nature of difference rather than comparative analysis.

Learning Outcomes

1. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain characters and ways that Native Americans' develop knowledge (epistemology); as measured by reports, critiques, reflective summaries, learning logs, analysis techniques and assessments.
2. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain concepts and composition of the metaphysics and cosmology (ontology) of Native American knowledge; as measured by reports, critiques, reflective summaries, learning logs, analysis techniques, and assessments.

NATV 4210. Native American Education

3 Credits (3)

This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.

Learning Outcomes

1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written a paper about an American Indian boarding school and its legacy.

NATV 4220. Federal Indian Policy**3 Credits (3)**

This course provides a basic historic overview of federal Indian policy. As preexisting sovereign nations, the U. S. Constitution acknowledges only states, foreign nations, and Indian tribes as sovereign governments. The purpose is to provide a fundamental understanding of the unique position Indian tribes occupy in this country. It examines impacts and effects on culture and contemporary livelihood.

Learning Outcomes

1. The student can recall and identify fundamental laws, policies, and court actions affecting Indian tribes.
2. The student can describe and explain the effects of federal Indian policy on activities and interactions between Native American and the overall society.
3. The student can analyze and interpret the impacts and effects of federal Indian policy on culture and contemporary lives of Native Americans

NATV 4310. Indigenizing Methodologies in Native American Studies**3 Credits (3)**

This course utilizes decolonizing (indigenizing) methodologies and praxis to gain insight into the complex effects of oppression and colonization. The course uses critical and indigenous concepts to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Emphasis includes research theory and methodology, such as community participatory action research, that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people.

Crosslisted with: ANTH 541.

Learning Outcomes

1. The student is able to describe and explain some of the complex effects of oppression and colonization on indigenous peoples.
2. The student is able to identify historic and contemporary issues that have influenced and affected the study and research of indigenous peoples.
3. The student is able to convey particular research theory and methodology that is collaborative, inclusive, and pragmatic to ethics and cultural boundaries of indigenous people.

NATV 5120. Advanced Indigenous Peoples History of the United States**3 Credits (3)**

This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.

Learning Outcomes

1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student is able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 5210. Advanced Native American Education**3 Credits (3)**

This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.

Learning Outcomes

1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written paper about an American Indian boarding school and its legacy.

NAV-NAVAJO

NAV 101. Introduction to Navajo Studies**3 Credits (3)**

Covers geography, demography, institutions of modern Navajo society with historical overview. Restricted to: Community Colleges only.

NAV 111. Elementary Navajo I**4 Credits (4)**

Navajo for beginners with emphasis on speaking skills.

Prerequisite: not open to Navajo-speaking students except by consent of instructor.

NGEC-NATURAL GAS ENGINE COMP

NGEC 133. Natural Gas Engine Repair Technology

5 Credits (5)

This course will cover the engine fundamentals, cylinder head and valve trains, engine block, engine servicing, lubrication and cooling Systems. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. A basic knowledge about engine operation.
2. Practice shop safety, ability to identify potential hazards, tool identification, proper rigging and crane operation.
3. Ability to identify specific components of a natural gas engine and their function.
4. Locate and identify various components on and off an engine.
5. Safely start large stationary industrial natural gas engines.
6. List the steps of preventive maintenance on natural gas engines.
7. Completely disassemble a natural gas engine, clean and organize parts, and measure critical clearances using appropriate precision measuring tools.
8. Replace or repair any defects that are found on assigned engine, compile a list of parts needed to make repairs, assemble engine correctly, and start and run the engine.

NGEC 175. Natural Gas Compression Technology I

4 Credits (4)

This course delivers an introduction to the theory, application, rotary, and centrifugal natural gas compressor including operating principles, maintenance, and repair of the reciprocating, identification of the component parts and their functions, methods of balancing, and lubrication systems, and design characteristics. This course will also include calculations of gas flow, compressor sizing, rod loads, compressor analysis charts and horsepower ratings. In addition, this course will cover safety, precision measurement, use of the manuals, use of tools, and proper adjustments will be included with overhaul exercises. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Identify and analyze the re-usability of basic compressor parts.
2. Accurately diagnose failure of key core components of basic compressors.
3. Identify basic preventive maintenance tasks on natural gas compressors.
4. Identify the key concept of troubleshooting of natural gas compressors by applying failure analysis techniques to arrive at the root cause of the failure.
5. Demonstrate safety procedures in the workshop and follow appropriate steps to work with the compressor.

NGEC 185. Natural Gas Compression Technology II

4 Credits (4)

This course delivers the principles of operation for natural gas engines and compressors. It includes process of startup and shutdown of natural gas compressor skid. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Prerequisite(s): Grade of C or better in NGEC 175.

Learning Outcomes

1. Demonstrate a hub alignment.
2. Describe start up procedures.
3. Describe shutdown procedures.
4. Demonstrate proper bolt torquing with appropriate tools.
5. Demonstrate proper valve removal.
6. Demonstrate proper safety procedures including lockout and tag-out.

NGEC 245. Natural Gas Engine Management and Control Technology

5 Credits (5)

This course delivers operational and application studies of Engine Management System Fundamentals, Sensors, Engine Inspection, and Engine Management Fault Investigation. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Identify specific components of a natural gas engine and their function.
2. Explain the four major systems of a natural gas engine.
3. Identify specific components of a natural gas engine and their function.
4. List the steps of preventive maintenance on natural gas engines.

NGEC 246. Fuel and Emissions Technology

5 Credits (5)

This course delivers operational and application studies of fuel components and emissions control system. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Identify specific components of a natural gas engine and their function.
2. List the steps of preventive maintenance on natural gas engines.
3. Know the fuel components and operation
4. Locate and identify various components on and off an engine.
5. Safely start stationary industrial natural gas engines.

NGEC 295. Special Topics

2 Credits (2)

Topics are to be announced in the Schedule of Classes. The topic and project are to be discussed and implemented between faculty member and student. Student gives presentation to class at the end of the term of study. All-Natural Gas Compression Technology classes in the NGEC Program must be completed or in progress before enrolling in this course. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. The student should provide an overall meaning during the individual time in the NGEC Program for this final project.

NMNC-NEW MEXICO NURSING EDUCATION CONSORTIUM

NMNC 3110. Introduction to Nursing Concepts

3 Credits (3)

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNC course number: NMNC 1110. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Corequisite: NMNC 3120, NMNC 3135.

Learning Outcomes

1. Integrate knowledge from nursing pre- and co-requisites into a conceptual learning model.
2. Apply conceptual learning to select nursing concepts.
3. Define personal values, beliefs, and attitudes about health and wellness.
4. Describe importance of identifying patient safety issues.
5. Describe roles and values of nursing and members of the health care team.
6. Describe standards and regulations that apply to nursing practice.

NMNC 3120. Evidence-Based Practice

3 Credits (3)

The focus of this course is the principles of evidence-based nursing practice. It includes the identification of clinical practice problems, the evaluation of available evidence, and the integration of evidence with clinical expertise and patient preferences in application to practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Corequisite: NMNC 3110, NMNC 3135.

Learning Outcomes

1. Examine integrating evidence-based practice with diverse patients' values.
2. Identify clinical practice problems and issues.
3. Explain the research process.
4. Describe how evidence is generated through the research process.
5. Appraise evidence and standards of care that support best clinical outcomes and patient safety.
6. Utilize informatics to access evidence-based practice guidelines.

NMNC 3135. Principles of Nursing Practice

4 Credits (4)

This course introduces the nursing student to the application of concepts through clinical skills in seminar, laboratory, and/or clinical settings. Principles of communication, assessments, safety, and interventions including accurate calculation, measurement, and administration of medications will be included. Same as NMNC course number: NMNC 1135. Restricted to: BSN, BSNP, and BSNR Majors. May be repeated up to 4 credits.

Corequisite: NMNC 3110, NMNC 3120.

Learning Outcomes

1. Describe the different types and characteristics of communication in professional nursing practice.
2. Utilize the concepts presented in Level One nursing courses in the application to the care of the patient.
3. Demonstrate the principles of safety during the implementation of nursing skills.
4. Demonstrate the learned skills in patient based scenarios.
5. Utilize the nursing process to provide safe and effective care.

NMNC 3210. Health and Illness Concepts I

3 Credits (3)

This course will focus on health and illness concepts across the lifespan. Concepts covered are related to homeostasis/regulation, sexuality/reproductive, protection/movement, and emotional processes. Same as NMNC course number: NMNC 1210. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3220, NMNC 3230, NMNC 3235.

Learning Outcomes

1. Describe the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Discuss evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Explain the collaboration necessary related to the concepts/exemplars of the course.
4. Utilize informatics and resources related to the concepts/exemplars of the course.
5. Integrate considerations of normal physiology and healthy adaptations into nursing practice of patients across the lifespan.

NMNC 3220. Health Care Participant**3 Credits (3)**

This course introduces the nursing student to the attributes of the health care participant as an individual, a family, or a community. Same as NMNC course number: NMNC 1220. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3210, NMNC 3230, NMNC 3235.

Learning Outcomes

1. Identify values, beliefs and attitudes toward health and illness of the health care recipient.
2. Articulate the role of nursing in relation to the health of vulnerable populations and elimination of health disparities.
3. Describe the protective and predictive factors which influence the health of families, groups, communities, and populations.
4. Describe the use of evidence-based practices to guide health teaching, health counseling, screening, outreach, disease and outbreak investigation, referral, and follow-up throughout the lifespan.
5. Describe the use of information and communication technologies in preventive care.
6. Examine the health care and emergence preparedness needs of the local community and in the state of New Mexico.
7. Identify clinical prevention and population-focused interventions with attention to effectiveness, efficiency, cost-effectiveness, and equity.

NMNC 3230. Nursing Pharmacology**3 Credits (3)**

This course introduces the nursing student to pharmacologic nursing practice from a conceptual approach. Same as NMNC course number: NMNC 1230. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3210, NMNC 3220, NMNC 3235.

Learning Outcomes

1. Identify the nurse's professional role related to pharmacotherapeutics in diverse populations across the lifespan.
2. Identify safety issues and minimize risk potential associated with pharmacotherapeutics and complementary and alternative medicine.
3. Utilize evidence-based information integrating pharmacologic and pathophysiologic concepts to guide medication therapeutics.
4. Describe health care system protocols related to pharmacotherapeutics.
5. Identify methods of communication with the health care team related to pharmacotherapeutics.
6. Utilize informatics systems related pharmacotherapeutics.
7. Describe common classes of drugs that are used in health care, including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics.

NMNC 3235. Assessment and Health Promotion**4 Credits (4)**

This course introduces the nursing student to the assessment of and the health promotion for the health care participant as an individual, a family, or a community. This course uses seminar, laboratory and/or clinical settings. Same as NMNC course number: NMNC 1235. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3210, NMNC 3220, NMNC 3230.

Learning Outcomes

1. Assess physical health including a focus on the health/illness beliefs, values, attitudes, developmental level, functional ability, culture, and spirituality of the participant.
2. Assess family health including a focus on family health history, environmental exposures, and family genetic history to identify current and future health problems.
3. Collaborate with a community to assess their health needs
4. Utilize community assessment data and evidence-based practice as basis for identifying community health needs.
5. Document health assessments in electronic health record or written formats.
6. Share community assessment data with other health care professionals to identify needed interventions.
7. Explain the role of the nurse in relation to advocacy for the health care recipient.
8. Analyze education materials for health literacy concerns.

NMNC 4310. Health & Illness Concepts II**3 Credits (3)**

This course covers health and illness concepts across the lifespan with the focus on chronic conditions. Concepts covered are related to oxygenation and hemostasis, homeostasis and regulation, protection and movement, and cognition and behavior processes. Same as NMNC course number: NMNC 2310. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.

Corequisite: NMNC 4320, NMNC 4335.

Learning Outcomes

1. Relate the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Investigate evidenced-based practice, standards of nursing care, and factors to improve safety related to selected concepts and exemplars.
3. Examine how members of the health care team collaborate in the delivery of care related to selected concepts and exemplars.
4. Discuss available technology for the delivery of nursing care related to selected concepts and exemplars.
5. Apply selected health and illness concepts to the nursing care of patients across the lifespan.

NMNC 4320. Professional Nursing Concepts I**3 Credits (3)**

This course covers foundational concepts for professional development, including selected professional attributes and care competencies. Same as NMNC course number: NMNC 2320. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.

Corequisite: NMNC 4310, NMNC 4335.

Learning Outcomes

1. Examine the ethical values, virtues, principles, and policies that guide the moral delivery of health care.
2. Relate the nurse's interpretation of patient needs, concerns, and health problems with nursing decisions.
3. Discuss the factors which motivate individuals, groups, and organization to deliver quality nursing care.
4. Determine how interactions of health care team members provide quality patient care.

NMNC 4335. Care of Patients with Chronic Cndtns**4 Credits (8P)**

The focus of this course is to provide safe, evidence-based nursing care for patients with chronic conditions, across the lifespan in a variety of settings. This course builds upon curricular concepts. This course is a combination of lab and clinical. Same as NMNC course number: NMNC 2335. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.

Corequisite: NMNC 4310, NMNC 4320.

Learning Outcomes

1. Demonstrate ethical practice in the delivery of nursing care to patients with chronic conditions.
2. Apply understanding of the principles of safe nursing care for patients with chronic conditions.
3. Demonstrate knowledge of appropriate evidence-based protocols when providing nursing care to patients with chronic conditions.
4. Apply understanding of appropriate health care policy, finance, and regulatory environments in the care of patients with chronic conditions.
5. Communicate effectively with patients with chronic conditions and health care team members.
6. Demonstrate an understanding of the technology used in the care of patients with chronic conditions.
7. Utilize the nursing process to deliver nursing care to patients with chronic conditions.

NMNC 4410. Health & Illness Concepts III**4 Credits (4)**

This course will cover health and illness concepts, with the focus on acute conditions across the lifespan. Concepts covered are related to homeostasis/ regulation, oxygenation/ hemostasis, protection/ movement, and emotional processes. Same as NMNC course number: NMNC 2410. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.

Corequisite: NMNC 4435, NMNC 4445.

Learning Outcomes

1. Anticipate health care participant's risk for potentially harmful situations related to the concepts/exemplars of the course.
2. Integrate evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Differentiate the multiple roles of the health care team related to the concepts/exemplars of the course.
4. Integrate use of appropriate technology related to the concepts/exemplars of the course.
5. Interrelate risk factors, concepts, physiologic processes, patient attributes, and clinical management of the exemplars covered in this course.

NMNC 4435. Clinical Intensive I**4 Credits (4)**

This is the first of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNC course number: NMNC 2435. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.

Corequisite: NMNC 4410, NMNC 4445.

Learning Outcomes

1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into plan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care settings.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4445. Clinical Intensive II**4 Credits (4)**

This is the second of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNEC course number: NMNC 404. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.

Corequisite: NMNC 4410, NMNC 4435.

Learning Outcomes

1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into plan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care setting.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4510. Concept Synthesis**3 Credits (3)**

This course focuses on the synthesis of curricular concepts in the care of complex patients. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.

Corequisite: NMNC 4520, NMNC 4535, NMNC 4545.

Learning Outcomes

1. Synthesize curricular concepts into patient-centered nursing practice that is appropriate for diverse individuals, families, and communities.
2. Synthesize the evidence base into nursing care of patients across the lifespan.
3. Evaluate leadership principles that integrate the application of health care policies and standards.
4. Evaluate effectiveness of interprofessional collaboration in the delivery of health care for quality patient outcomes.
5. Evaluate technologies for the management of information and in the delivery of patient care.

NMNC 4520. Professional Nursing Concepts II**3 Credits (3)**

This course covers policy concepts for professional nursing. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.

Corequisite: NMNC 4510, NMNC 4535, NMNC 4545.

Learning Outcomes

1. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
2. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
3. Synthesize care delivery concepts to improve quality patient outcomes and professional nursing practice.
4. Analyze impact of health care delivery systems on patient care outcomes.
5. Compare and contrast health care policies and evidence-based practice.

NMNC 4535. Clinical Intensive III**4 Credits (4)**

The focus of this clinical course is application of the curricular concepts in the management of care participants with complex conditions across the lifespan. Same as NMNEC course no.: NMNEC503. Restricted to: BSN, BSNP, BSNR, NURS majors. May be repeated up to 4 credits.

Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.

Corequisite: NMNC 4510, NMNC 4520, NMNC 4545.

Learning Outcomes

1. Integrate diverse patient values into plan of care for patients with complex illness.
2. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
3. Integrate an evidence-based approach in the delivery and evaluation of nursing care to patients with complex illness across the lifespan.
4. Evaluate the use of policies and procedures within the complex care setting.
5. Effectively collaborate with the health care team in the delivery of patient care.
6. Integrate use of appropriate technology for the delivery of nursing care to patients with complex illness.

NMNC 4545. BSN Capstone**4 Credits (4)**

The synthesis, integration, and application of concepts to professional nursing practice will be applied in the final clinical course to ensure readiness to enter practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.

Prerequisite: Successful completion of all previous nursing courses.

Corequisite: NMNC 4510, NMNC 4520, NMNC 4535.

Learning Outcomes

1. Synthesize and integrate nursing practice concepts into their professional nursing practice.
2. Engage in professional nursing practice that is patient-centered and appropriate for diverse individual, families, and communities.
3. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
4. Deliver nursing care that is evidence-based.
5. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
6. Engage in effective interprofessional collaboration in the delivery of health care for quality patient outcomes.
7. Utilize technologies for the management of information and in the delivery of patient care.

NURS-NURSING

NURS 1110. Pre-Nursing Freshman Seminar**1 Credit (1)**

This Freshman seminar provides an introduction to the university and its resources, an orientation to the pre-nursing curriculum, and overview of concepts for professional nursing practice. Emphasis is placed on exploring the nurse's role as an integral member of the healthcare team across multiple contexts and settings, and developing a professional identity. Consent of Instructor required.

Learning Outcomes

1. Develop strategies for transitioning to university life and a pathway to the nursing program, through evaluating knowledge, skill, and experience strengths and deficits.
2. Understand the role nurses and other interprofessional partners play in addressing issues regarding the patient experience across multiple healthcare settings.
3. Identify and examine cultural, professional and personal beliefs and values of nurses as they relate to patient care and working in multidisciplinary teams.
4. Begin to explore nursing careers in a variety of healthcare settings, across the nation.

NURS 120. Introduction to Pharmacology**3 Credits (3)**

General principles of pharmacology including methods of administration, effect on the body, interactions with other drugs, and classification of drugs. Focus on the health care provider's role in safe pharmacologic intervention. May be repeated up to 3 credits. Crosslisted with: HIT 120. Restricted to Community Colleges campuses only.

NURS 127. Medication & Dosage Calculation**2 Credits (2)**

General principles of medication administration including computation of medication dosage, preparation, safe administration, and documentation of multiple forms of drugs. Includes instruction on various systems of measurement. Applies critical thinking in the administration of oral, topical, enteral, and parenteral medications. Restricted to: Nursing and Medical Assisting Majors. May be repeated up to 2 credits.

Learning Outcomes

1. The student will demonstrate accurate dosage calculation; discuss the principles of medication administration, identify the classification of drugs used for various disorders of the systems, administration safety and identify the elements of accurate documentation of medication administration.

NURS 130. Foundations of Pharmacology**3 Credits (3)**

This course provides the nursing student with an introduction to the foundations of pharmacology including: science of drug action, principles of medication administration, accurate calculation of drug doses, medication therapy across the lifespan, application of medications to treat health alterations, normal and adverse responses by the client to medication therapy, medication safety, medication regulation, national patient safety goals, and appropriate nursing interventions to achieve the desired goals of medication therapy. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to pharmacological therapy as measured by: a. Recognize the influence of values, preferences, and expressed needs on the administration of pharmacotherapeutics to populations across the lifespan; b. Explain the nurse's professional role related to pharmacotherapeutics in diverse populations across the lifespan
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly related to adverse or side effects of pharmacological therapy throughout the lifespan as measured by: a. Identify methods for communication with the health care team related to pharmacotherapeutics; b. Explain how members of the health care team collaborate in the delivery of pharmacotherapeutics
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes related to the administration of pharmacological therapy as measured by: a. Apply evidence-based information to the administration of pharmacotherapeutics
4. Demonstrate adherence to policies, procedures, and standards of care for the administration of pharmacological therapy in healthcare delivery systems as measured by: a. Give examples of policies, procedures, and standards of care related to selected medication administration topics
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care as measured by: a. Give examples of policies, procedures, and standards of care related to selected medication administration topics; b. Give examples of common classes of drugs that are used in health care and their related pharmacokinetics, pharmacodynamics, and pharmacotherapeutics
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for the administration of pharmacological therapy across the lifespan as measured by: a. Discuss available technology for delivery of nursing care related to pharmacotherapeutics

NURS 134. Foundation of Nursing Skills and Assessment**3 Credits (1+6P)**

This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan. Students must be admitted into the Nursing Program to enroll in this course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness as measured by: a. Describe modifications to nursing care based on client cultural and religious influences; b. Demonstrate physical assessment skills for clients across the lifespan utilizing appropriate equipment and techniques.
2. Describe scopes of practice, roles and values of health care team members as measured by: Identify independent and collaborative nursing interventions.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan as measured by: a. Demonstrate safe performance of basic nursing procedures; b. Identify quality sources of information to verify skills and interventions are based on evidence.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care as measured by: Identify need/situation where reporting of incident/event/irregular occurrence/variance is appropriate.
5. Describe strategies that reduce the risk of harm to self and others as measured by: a. Identify methods utilized to provide safe and effective care; b. Identify and document changes in patient status.
6. Identify essential information that must be available in a common database to support patient care across the lifespan as measured by: a. Select standard technology utilized to provide basic care to clients across the lifespan; b. Identify approved abbreviations and standard terminology for documenting care.

NURS 136. Foundations of Nursing Practice**6 Credits (4+6P)**

This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and foundational nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in the simulation lab, long-term care, the community, and rehabilitation settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of one adult client and to develop care planning skills related to actual problems. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness as measured by: a. Identify personal values, beliefs, and attitudes about health and wellness; b. Define health protection, health promotion, and disease prevention; c. Describe the basic principles of the teaching/learning process.
2. Describe scopes of practice, roles and values of health care team members as measured by: a. Describe roles/responsibilities, scope of practice and values of health care team members; b. Identify principles of delegation to other members of the healthcare team.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan as measured by: a. Describe EBP to include components of research evidence, clinical expertise, and patient/family values; b. Describe standards and regulations that apply to nursing and ethical practice.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care as measured by: Identify sources of information regarding national standards or policies regarding patient care across the lifespan.
5. Describe strategies that reduce the risk of harm to self and others as measured by: a. Define patient safety and quality of care; b. Describe methods to identify, report variances, and reduce risk of harm in provision of professional nursing care.
6. Identify essential information that must be available in a common database to support patient care across the lifespan as measured by: a. Identify quality sources of information and communication techniques designed to mitigate error and protect confidentiality of protected health information across the lifespan.

NURS 137. Care of Geriatric Patient**3 Credits (3)**

This course will introduce the nursing student to foundational concepts of age-appropriate/specific care of the older adult who represents the largest population of individuals placing demands on the healthcare system. It includes basic and complex concepts and issues related to care of the older client across the care continuum, provision of cost-effective care in a resource sparse environment. Students must be admitted into the nursing program to enroll in this course. Restricted to: NURS majors. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by older adults related to chronic illness and age-related changes, as well as their preferences and expressed needs as measured by: a. Give examples of cultural, religious, socioeconomic, environmental, and internal influences on the health and illness of an older adult; b. Select health protection, health promotion, and disease prevention strategies related to care of older adults; c. Relate own beliefs and attitudes related to aging that might impact ability to provide care to the older adult.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of older adults with commonly occurring chronic illness or age-related changes as measured by: a. Locate care delivery settings and sources for referral and coordination of healthcare needs for older adults.
3. Compare an individualized patient care plan utilizing an evidence-based approach for older adults to outcomes related to the administration of pharmacological therapy as measured by: a. Describe sources of information regarding evidenced-based protocols for care of older adults; b. Use principles of ethical practice in delivery of care to the older adult.
4. Demonstrate adherence to policies, procedures, and standards of care related to the provision of professional nursing care of older adults with chronic diseases as measured by: a. Give examples of healthcare policies and national standards of care related to the provision of care to older adults.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care pertinent to the provision of care to older adults: a. Recognize potential and actual safety issues that are pertinent to the provision of care to older adults; b. Apply nursing interventions that reduce risk of harm to older adults.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care to support care of older adults as measured by: a. Discuss issues with use of technology related to the care of older adults; b. Discuss essential information that needs to be in a common database relevant to care of the older adult.

NURS 140. Pathophysiology for Allied Health Professionals**3 Credits (3)**

Introduction to the nature of disease and its effect on body systems. Deals with the disease processes affecting the human body via an integrated approach to specific disease entities. Includes a review of normal functions of the appropriate body systems. Diseases are studied in relationship to their etiology, pathology, physical signs and symptoms, diagnostic procedures, complication, treatment modalities, and prognosis. Restricted to Allied Health and Health Information Technology majors. Restricted to: Community Colleges only.

NURS 144. Pharmacology, Essentials of Medication Safety
2 Credits (2)

This course introduces the nursing student to pharmacological nursing practice across the lifespan. The student identifies the nurse's professional role related to pharmacotherapeutics in diverse populations. Safety issues and minimization of risk potential associated with pharmacotherapeutics, complementary, and alternative medicines are discussed. Health care system protocols, communication methods, and informatics related to pharmacotherapeutics are included in the course content. Common drug classes and the pharmacotherapeutics, pharmacodynamics, and pharmacotherapeutics associated with each class are included in this course. Restricted to NURS Majors.

Prerequisite: NURS 127.

Learning Outcomes

1. Discuss drug classifications including the uses, actions, pharmacodynamics, indications, pharmacokinetics, contraindications, adverse effects, and nursing implications.
2. Provide patient with education regarding a newly prescribed medication.

NURS 146. Common Health Deviations
6 Credits (4+6P)

Common health deviations and the manner by which they alter various body functions are explored. The role of the licensed practical nurse in assisting clients with common health deviations is presented. Ethical and legal implications and the role of the practical nurse are also considered. The licensed practical nursing student will utilize the application of knowledge to client care situation both in the subacute and acute care settings. The nursing process is presented as guide for coordinating client care. Grade of C or better. Restricted to: NURSING majors. May be repeated up to 6 credits.

Prerequisite: (NURS 127 or NURS 153), NURS 156, NURS 154, NURS 157, and NURS 210 OR consent of program director.

Learning Outcomes

1. Utilize critical thinking and systematic problem-solving process as a framework for providing care for adult patients in structured health care setting with complex health care needs.
2. Utilize critical thinking and problem solving skills in prioritizing the management and coordination of all aspects of care.

NURS 147. Adult Health I
6 Credits (4+6P)

This course focuses on application of the nursing process and theoretical concepts of care for adults with commonly occurring health problems. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to continue development of: prioritization skills, proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one adult client. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to Community Colleges campuses only. May be repeated up to 6 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness as measured by: a. Give examples of how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their care related to selected course topics for adult clients with chronic and acute illness; b. Select health protection, health promotion, and disease prevention strategies related to selected course topics for adult clients; c. Relate the scope, risk factors, physiologic processes, attributes, and clinical management of chronic disease to selected course topics for adult clients.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan as measured by: a. Locate significant information to report to other disciplines; b. Select resources for continuity of patient care related to selected topics; c. Apply the principles of delegation to selected course topics.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s) as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics; b. Use principles of ethical practice in the delivery of nursing care for patients with chronic or acute illness.
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems as measured by: a. Give examples of policies, procedures, and standards of care related to selected course topics.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care as measured by: a. Identify variations in physiologic integrity related to selected course topics; b. Apply nursing interventions to reduce risk of harm related to selected course topics.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan as measured by: a. Discuss available technology for delivery of nursing care related to selected topics.

NURS 149. Mental Health Nursing**3 Credits (2+3P)**

This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to develop ability to develop: proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one client across the life span with acute/chronic mental health needs. Students must be concurrently enrolled in both the lecture and lab sections of this course. Students must be admitted into the Nursing Program in order to enroll in the course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness as measured by: a. Give examples of how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their health care related to selected mental illness topics across the lifespan; b. Select health protection, health promotion, and disease prevention strategies related to selected course topics; c. Relate the scope, risk factors, physiologic processes, attributes, and clinical management related to selected mental illness topics across the lifespan.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan as measured by: a. Locate significant information to report to other disciplines; b. Select resources that provide continuity of care related to selected course topics; c. Apply the principles of delegation to selected course topics.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s) as measured by: a. Implement individualized patient care utilizing an evidence-based approach for patients with chronic or acute mental illness; b. Describe the principles of ethical practice in the delivery of nursing care for patients with chronic or acute mental illness.
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems as measured by: a. Give examples of policies, procedures, and standards of care related to selected course topics.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care as measured by: a. Identify variations in psychosocial integrity related to selected course topics; b. Apply nursing interventions to reduce risk of harm related to selected course topics.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan as measured by: a. Discuss available technology for delivery of nursing care related to selected mental health topics.

NURS 150. Medical Terminology**3 Credits (3)**

Understanding of the basic elements of medical words. Use of medical abbreviations. Same as OEHO 120 and BOT 150. May be repeated up to 3 credits. Crosslisted with: BOT 150, AHS 120 and HIT 150.

NURS 153. Medication and Dosage Calculation**1 Credit (1)**

Techniques of dosage calculation for medication and fluid administration. RR applicable. Students must meet NMSU basic skills requirement in mathematics to enroll in this course.

Corequisite(s): NURS 156 and NURS 154.

NURS 154. Physical Assessment**2 Credits (2)**

Beginning techniques of physical assessment by systems will be presented using the nursing process as a guide for providing safe client centered care throughout the life span. Grade of C or better is required. Restricted to Nursing Majors. Restricted to Dona Ana Campus. May be repeated up to 2 credits.

Prerequisite: BIOL 1130 or BIOL 2210.

Corequisite: NURS 127, NURS 156.

Learning Outcomes

1. The student will demonstrate a systematic (head to toe) physical assessment to gather objective data
2. The student will explain the characteristics of growth and development of individuals throughout the lifespan
3. The student will obtain a thorough health history to gather subjective data

NURS 155. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes.

NURS 156. Basic Nursing Theory and Practice**6 Credits (4+6P)**

Introduction to the nursing profession and the beginning skills of nursing practice as it relates to normalcy. The nursing process is presented as a means of guiding the student in providing safe client centered care. Ethical and legal aspects of nursing practice are also included. Basic clinical nursing skills will be presented and practiced in the nursing lab. The student will perform these skills with clients in an actual health care setting. Consent of Program Director requires. Restricted to: NURSING majors. Restricted to Dona Ana campus. May be repeated up to 6 credits.

Corequisite: NURS 154.

Learning Outcomes

1. Use evidence-based practice, critical thinking, and scientific rationales to plan safe care for adults who are experiencing alterations in health.
2. Utilize knowledge and concepts from the arts, sciences, and humanities to plan nursing care to enhance individual patient's health outcomes and quality of life.
3. Respect patients' unique responses to health and illness based on socio-cultural and physical environments.
4. Explore basic concepts of a community continuum of care, including the professional roles of interdisciplinary teams, community resource agencies, and family support systems.

NURS 157. Maternal/Child Health Deviations**8 Credits (6+6P)**

This course introduces the student to the concepts and principles of nursing care of the family from conception to adolescence. Utilizing the assessment, analyzing, planning, and implementation phases of the nursing process (the Care map), the student focuses on the supportive-educative nursing system to assist members of the family in meeting self-care requisites and how they are affected by the health deviations common to each developmental level beginning with conception and ending with adolescence. Knowledge gained in theoretical instruction is then applied to the patient care situation. After an introduction to the necessary clinical skills in the campus laboratory setting, students will participate in clinical experiences with the focus on the family from conception to adolescence. The assessment, analysis, planning, and implementation phases of the nursing process are emphasized as a tool to assist patients in meeting universal and developmental self-care requisites. Utilizing the nursing process, the student provides safe, client-centered care to diverse clients and families. Theoretical instruction is applied to client care situations. Students collaborate with clients, families, and the interdisciplinary team in meeting health care needs. Experiences may occur in the physician's office, local health department, day care centers, schools, or the hospital. Grade of C or better required. Restricted to: NURSING majors. Restricted to Carlsbad campus only.

Prerequisite: NURS 156, NURS 153, and NURS 154.

Corequisite: NURS 210.

Learning Outcomes

1. Determine how values of clients, families and medical personnel impact the involvement of clients in their health care related to maternal/child and pediatric clients.
2. Implement individualized client care utilizing an evidenced based approach related to maternal/child and pediatric clients.
3. Choose health protection, health promotion, and disease prevention strategies in the care of maternal/child and pediatric clients.
4. Apply the scope, risk factors, physiologic processes, and clinical management strategies to maternal/child and pediatric clients.
5. Choose resources for continuity of client care related to maternal/child and pediatric clients.
6. Give examples of significant information to report to other disciplines.
7. Apply the principles of delegation in the provision of client care with maternal/child and pediatric clients.
8. Utilize evidenced based information to implement a plan of care and employ nursing interventions for maternal/child and pediatric clients.
9. Use the principles of ethical practice in the delivery of nursing care for maternal/child and pediatric clients. 1
10. Apply policies, procedures and standards of care related to maternal/child and pediatrics in the provision of client care. 1
11. Apply nursing interventions to reduce risk of harm to self and others related to maternal/child and pediatric clients. 1
12. Choose available technology for delivery of nursing care related to maternal/child and pediatric clients.

NURS 201. Special Topics**3 Credits (3)**

Specific topics NCLEX course will help prepare students for the predictability exam and NCLEXRN. This course assists students in being emotionally, didactically and technically prepared to take both examinations. Students will review how to prepare to take this examination through a series of sample tests, quizzes and group discussions. A variety of core content subject matter will be covered to allow the student to be prepared to take the comprehensive examinations. At the conclusion of this course, the student will take a comprehensive predictability exam. Students must be admitted into the Nursing Program to enroll in this course. May be repeated up to 10 credits.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for acute and chronically ill patients through application to NCLEX style questions as measured by: a. Integrate the scope, risk factors, physiologic processes, and attributes of health, wellness, chronic, and acute disease into the clinical management of patients across the lifespan; b. Evaluate how values of patients, families, and medical personnel impacts the health, wellness, and illness of patients across the lifespan.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations through application to NCLEX style questions as measured by: a. Evaluate ability to apply the principles of delegation and prioritize care in patient-based scenarios across the lifespan; b. Evaluate ability to select appropriate resources for continuity of patient care across the lifespan.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan through application to NCLEX style questions as measured by: a. Evaluate ability to apply evidence-based approaches to the provision of patient care across the lifespan.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care through application to NCLEX style questions as measured by a. Evaluate ability to formulate a plan of care for provision of care in patient-based scenarios utilizing policies, procedures, and standards of care.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures through application to NCLEX style questions as measured by: a. Evaluate ability to effectively utilize strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan through application to NCLEX style questions as measured by: a. Evaluate ability to utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan.

NURS 209. Independent Study**1-4 Credits**

Individual studies to meet identified student needs. May be repeated for a maximum of 10 credits. Restricted to: Community Colleges only.

Prerequisite: admission to the nursing program.

NURS 210. Pharmacological Requisites of the Childbearing Family**1 Credit (1)**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care will be discussed focusing on medications commonly utilized with the childbearing family. Medication classes to be discussed include labor and delivery, analgesic, vitamins, respiratory, gynecological, endocrine, and anti-microbial/anti-infective drugs. Grade of C or better required.

Prerequisite(s): NURS 153, NURS 154 and NURS 156.

Corequisite(s): NURS 157.

Learning Outcomes

1. Effective communication skills in reading, writing, listening, and speaking.
2. Basic critical thinking skills including problem identification, evidence acquisition, evidence evaluation, and reasoning/conclusion.
3. An understanding of personal and social responsibility.
4. An ability to apply the fundamental concepts of quantitative reasoning in mathematics and science.
5. Appropriate information and digital literacy, and skills for personal and professional use.

NURS 211. Pharmacological Requisites of Simple Health Deviations**1 Credit (1)**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care are addressed focusing on medications related to the psychiatric, gastrointestinal, musculoskeletal, gynecological, hematological, and anti-neoplastic client. Grade of C or better required. Restricted to: Carlsbad campus only.

Prerequisite(s): BIOL 2210 and BIOL 2225 and NURS 153, NURS 154, NURS 156, NURS 157 and NURS 210.

Corequisite(s): NURS 246 and NURS 258.

NURS 212. Pharmacological Requisites of Complex Health Deviations**1 Credit (1)**

Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care is examined focusing on medications related to complex health deviations. Drug classes to be discussed include cardiovascular, renal, endocrine, and neurological. Grade of C or better required.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 246, NURS 258, NURS 210 and NURS 211.

Corequisite(s): NURS 256 and NURS 260.

Learning Outcomes

1. Apply principles of teaching/learning in educating clients on the use, adverse effects and interactions of pharmacotherapeutic agents used to treat complex health deviations.
2. Collaborate with members of the health care team in the delivery of pharmacotherapeutics to clients with complex health deviations.
3. Give examples of commonly prescribed drugs used to treat clients with complex health deviations and related pharmacokinetics and pharmacodynamics.
4. Discuss the relationship between the use of pharmacotherapeutics and the treatment of disease in clients with complex health deviations.
5. Identify safety issues and minimize risk potential associated with pharmacotherapeutics.

NURS 224. Maternal Child Nursing**5 Credits (4+3P)**

This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation lab, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 5 credits.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Determine how values of patients, families, and medical personnel impacts the involvement of patients in their health care related to selected course topics for maternal/child clients; b. Choose health protection, health promotion, and disease prevention strategies related to selected course topics for maternal/child clients; c. Apply the scope, risk factors, physiologic processes, attributes, and clinical management related to selected maternal/child and pediatrics topics.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as it relates to the child bearing woman (19-65 years) and pediatrics as measured by: a. Choose resources for continuity of patient care related to selected topics; b. Apply the principles of delegation to selected course topics; c. Give examples of significant information to report to other disciplines.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics; b. Use the principles of ethical practice in the delivery of nursing care for maternal/child patients.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Apply policies, procedures, and standards of care related to selected course topics for maternal/child clients.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Interpret variations in psychosocial integrity related to selected course topics for maternal/child clients; b. Apply nursing interventions reduce risk of harm to self and others related to selected course topics.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18) as measured by: a. Choose available technology for delivery of nursing care related to selected maternal/child clients.

NURS 226. Adult Health II**6 Credits (4+6P)**

This course focuses on application of nursing process and theoretical concepts of care for adults with complex health alterations. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to apply: prioritization skills, maintain proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, and care planning skills related to patient actual, psychosocial, and potential problems in the delivery of nursing care to meet needs of three adult clients. Students must be concurrently enrolled in both the lecture and lab sections of the course. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the adult client with acute illness as measured by: a. Determine how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their care related to selected course topics for adult clients with acute illness; b. Choose health protection, health promotion, and disease prevention strategies related to selected course topics for adult clients; c. Apply the scope, risk factors, physiologic processes, attributes, and clinical management of acute disease to selected course topics for adult clients.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to adult clients with acute illness as measured by: a. Choose resources for continuity of patient care related to selected topics; b. Apply the principles of delegation to selected course topics; c. Give examples of significant information to report to other disciplines.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to adult clients with acute illness as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics; b. Use principles of ethical practice in the delivery of nursing care for adult patients with acute illness.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to adult clients with acute illness as measured by: a. Apply policies, procedures, and standards of care related to selected course topics.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to adult clients with acute illness as measured by: a. Interpret variations in physiologic integrity related to selected course topics; b. Apply nursing interventions to reduce risk of harm to self and others related to selected course topics.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to adult clients with acute illness as measured by: a. Discuss available technology for delivery of nursing care related to selected topics.

NURS 235. Nursing Leadership and Management**1 Credit (1)**

This course introduces the intermediate nursing student to professional practice principles of nursing leadership and management including: health policy and politics, fiscal management & budgeting, conflict management, decision making, interdisciplinary practice, working with teams, roles in disaster planning and management, application of standards of care to risk management, organization of care delivery, health care systems, processes, and practice environments. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to Community Colleges campuses only. May be repeated up to 1 credit.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for acute and chronically ill patients as measured by: a. Discuss how personal values impacts the delivery of care to clients across the lifespan.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as measured by: a. Employ the principles of delegation to the assignment of nursing team duties and patient room assignments; b. Analyze effective communication with health care team members; c. Apply effective communication strategies in common nursing activities; d. Discuss methods to resolve conflict.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as measured by: a. Analyze personal values that influence approaches to ethical issues and decision-making; b. Describe ways in which nursing research can be used to guide nursing practice.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as measured by: a. Discuss the use of key indicators to measure performance; b. Recognize tools and processes for continuous quality improvement.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as measured by: a. Discuss ways to improve care while reducing costs; b. Incorporate an understanding of legal risks into the practice of professional nursing and recognize how to minimize risk.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as measured by: a. Discuss the necessity of using recognized taxonomies and standardized nursing languages in nursing documentation.

NURS 236. Nursing Preceptorship - Adult Health III**6 Credits (2+12P)**

This course is the final course involving care of the patient with acute or chronic illness. It focuses on care of patients with complex or multi-system problems allowing the graduating nursing student to discuss and apply all the skills learned in previous nursing courses. After successfully passing the HESI exam, students have clinical practice with preceptor in various health care settings. Selected clinical learning experiences in the simulation lab, acute care, and community settings will allow the student to: organize care of a group of clients, maintain proficiency in performance of nursing skills, collaborate with clients, families, peers and health care team members, and support care planning skills related to patient actual, psychosocial, and potential problems in the delivery of nursing care to meet needs of the preceptors group of clients. Students must be concurrently enrolled in both the lecture and lab sections of the course. Only students who have been admitted to the nursing program and have successfully completed all level 1, 2 and 3 nursing courses may enroll in this course. Clinical may include inpatient or outpatient care, days, evenings, nights, or weekend experiences. Students must be admitted into the Nursing Program to enroll in this course. Restricted to: NUR majors. Restricted to: Community Colleges only. May be repeated up to 6 credits.

Learning Outcomes

1. Integrate the values, preferences, attitudes, and expressed needs of the acutely ill patient into the plan of care related to the care of the adult client with complex health deviations as measured by: a. Analyze how personal values, values of patients, families, and medical personnel impacts the involvement of patients in their care related to selected course topics for adult clients with complex care issues; b. Evaluate health protection, health promotion, and disease prevention strategies related to selected course topics for adult clients; c. Integrate the scope, risk factors, physiologic processes, and attributes of complex acute diseases into the clinical management of these disease related to selected course topics for adult clients.
2. Integrate the contributions of other members of the healthcare team into the delivery of nursing care for individuals across the lifespan with complex or multi-system health alterations related to the care of the adult client with complex health deviations as measured by: a. Use resources for continuity of patient care related to selected topics; b. Report significant information to other disciplines.
3. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences in the creation of a plan of care for delivery and evaluation of care for patients across the lifespan related to the care of the adult client with complex health deviations as measured by: a. Implement individualized patient care utilizing an evidence-based approach related to selected course topics for multiple clients; b. Practice ethically in the delivery of nursing care for adult patients with complex care issues.
4. Evaluate the use of policies, procedures and standards of care in healthcare delivery systems and adapt the care as appropriate related to the care of the adult client with complex health deviations as measured by: a. Formulate a plan of care for the provision of care to complex patients in healthcare delivery systems using policies, procedures, and standards of care related to selected course topics.
5. Interpret and analyze effective use of strategies to reduce risk of harm to self or others while providing professional nursing care, creating a structure for implementation of evidence-based practice, national patient safety goals, and core measures in the care of the adult client with complex health deviations as measured by: a. Interpret variations in physiologic integrity related to selected course topics; b. Integrate nursing interventions to reduce risk of harm related to selected course topics including evidence-based practice, national patient safety goals, and core measures.

NURS 246. Health Deviations I**7 Credits (4+9P)**

Introduction to medical/surgical clients, whose health care needs are routine and predictable. Focus is on simple health deviations, including concepts relative to health promotion and maintenance. The nursing process is utilized to provide evidenced based, safe client centered care. Students are expected to apply clinical judgment, communicate and collaborate with clients and the interdisciplinary team in providing care for a group of two to three clients. Grade of C or better required. May be repeated up to 7 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 156, NURS 154, NURS 157 and NURS 210.

Corequisite(s): NURS 211, NURS 258.

NURS 256. Health Deviations II**8 Credits (6+12P)**

Concepts and principles applied to clients with complex health deviations. Building upon knowledge gained in NURS 246, focus will be on acutely ill clients. The nursing process continues to serve as a guide to provide safe, client centered care. The student collaborates with the interdisciplinary team in all aspects of client care. Student experiences the role of the staff nurse under the guidance and direction of the nursing instructor. Grade of C or better required. May be repeated up to 8 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 210, NURS 211, NURS 246, and NURS 258.

Corequisite(s): NURS 212, NURS 260.

Learning Outcomes

1. Apply each step of the nursing process as a method of organizing the nursing care for patients with complex health deviations.
2. Discuss the patient's health care needs that occur as a result of complex health deviations.
3. Explain methods the nurse can employ in allowing the patient to assume the right and responsibility for his own care.
4. Incorporate the concepts and principles derived from the biological, developmental, social, nutritional and computer sciences and nursing knowledge that relate to the nursing care of patients with complex health deviations.
5. Explain the roles and functions of the members of the health care team including ancillary personnel as they relate to the care of patients with complex health deviations.
6. Explain the rationale for the performance of the following technical skills: a. EKG monitoring; b. Rhythm strip interpretation; c. Hemodynamic monitoring and interpretation; d. Tracheal suctioning
7. Recognize the nurse's role in establishing a therapeutic relationship with patients experiencing complex health deviations.

NURS 258. Psychosocial Requisites: A Deficit Approach**3 Credits (2+3P)**

Nursing theory and practice as it relates to the care of the client experiencing psychosocial health deviations. The role of the nurse is discussed along with the ethical and legal aspects of care for the client with psychosocial disorders. Building upon the communication skills of listening and responding, the student develops the therapeutic skills of interpersonal relationships. Grade of C or better is required. May be repeated up to 3 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 210, and NURS 246.

Corequisite(s): NURS 211, NURS 246.

NURS 260. Management of Patients with Health Deviations**2 Credits (2)**

A capstone course to the nursing program in which principles in management and delegation to less prepared personnel is explored. A review of leadership roles, legal issues, quality initiatives, informatics and scope of practice is included. Preparation for the NCLEX is an integral portion of the course. Grade of C or better is required. May be repeated up to 2 credits. Restricted to: Nursing majors. Restricted to Carlsbad campus only.

Prerequisite(s): NURS 153, NURS 154, NURS 156, NURS 157, NURS 210, NURS 211, NURS 246, and NURS 258.

Corequisite(s): NURS 212, NURS 256.

Learning Outcomes

1. Discuss nursing practice concepts relevant to the practice of professional nursing.
2. Evaluate principles of quality improvement and safety into nursing practice within healthcare organizations and systems.
3. Apply leadership concepts through the application of policies that apply to healthcare delivery.
4. Promote a culture of safety through anticipating and eliminating potentially harmful situations.
5. Collaborate in systems analysis when clinical errors or near misses occur to reduce harm, minimize blame, and encourage transparency.
6. Integrate evidence in determining best clinical practice.
7. Demonstrate basic knowledge of healthcare policy, finance, and regulatory environments, including local, state, national, and global healthcare trends.
8. Use an ethical framework to evaluate the impact of policies of healthcare, especially for vulnerable populations.

NURS 3110. Human Pathophysiology Foundation for Nursing**4 Credits (4)**

Human pathophysiology concepts of adaptation and alteration in function and structure across the life span and their implications for nursing practice. Restricted to: BSNR, BSN, BSNP or consent of instructor majors. May be repeated up to 4 credits.

Prerequisite: Grade of C- or better in both (BIOL 353 & BIOL 2221/BIOL 354), or (BIOL 2210 & BIOL 2225), or (SPMD 2210 & SPMD 3210).

Corequisite: NMNC 3110, NMNC 3135.

NURS 3115. Care of the Veteran Population**3 Credits (3)**

This course prepares healthcare and other professionals to care for the Veteran population. Specific topics and health issues explored include military and veteran culture, women in the military, post-traumatic stress disorder, traumatic brain injury, military sexual trauma, and chemical exposures. An overview of the Veterans Health Administration, the largest healthcare system in the USA, will be provided. May be repeated up to 3 credits.

Learning Outcomes

1. Examine Veterans' demographics and the impact of political, social, cultural, and environmental factors.
2. Analyze the mission of the Veterans Health Administration with a focus on healthcare system and services.
3. Evaluate health concerns, issues, and health seeking behaviors within the diverse Veteran population.
4. Appraise available evidence on delivering culturally sensitive care that addresses the needs of the Veteran patient and their family.

NURS 3996. Special Topics**1-9 Credits (1-9)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 21 credits.

Learning Outcomes

1. Varies

NURS 4110. Strategies for Student Success**3 Credits (3)**

This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors. May be repeated up to 3 credits.

NURS 4997. Independent Study**1-3 Credits (1-3)**

Individual studies with prior approval of department head. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

NURS 5110. Evidence-Based Practice for Healthcare Leaders**3 Credits (3)**

This course is designed to prepare nurse administrators and other healthcare leaders with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. May be repeated up to 3 credits.

Learning Outcomes

1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 5115. Quality Improvement for Healthcare Leaders**3 Credits (3)**

This course is designed to prepare nurse administrators and other healthcare leaders with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. Restricted to: exclude Online MSN in Nursing Administration majors.

Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of administrators in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Understand the role of health policy and national standards in guiding quality improvement initiatives.

NURS 5120. Nursing Informatics**3 Credits (3)**

This course provides the foundational knowledge necessary to integrate systems and information technologies. Topics include informatics, knowledge management, healthcare information systems/telehealth including the electronic health record. Focuses on using available technology to enhance safety and monitor the health status and outcomes of populations. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

NURS 5125. Health Policy for Advanced Nursing Practice**3 Credits (3)**

Course provides a conceptual approach to understanding health policy including the social, legal, political and ethical factors that influence policy development. Strategies for influencing policy direction and change are examined. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

NURS 5130. Promoting Health Behavior**3 Credits (3)**

Emphasis is on the role of the advanced practice nurse in facilitating health behavior change. The impact of health status on health behavior, ethical issues relate to health promotion, and the processes for promoting healthy behaviors are explored. Theoretical models of behavior change and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change. May be repeated up to 3 credits.

NURS 5210. Advanced Leadership in Healthcare**3-5 Credits (3+1-2P)**

Analysis of leadership theories as they pertain to the nurse executive and the advanced practice nurse in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Clinical component included for DNP students only. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 5 credits.

**NURS 5220. Management of Human and Fiscal Resources in Nursing
4 Credits (3+3P)**

This graduate level course examines and applies contemporary concepts of human and fiscal resource management for the nurse administrator. Focus is placed on achieving quality outcomes through effective management of human assets and organizational resources in health care settings. The course includes a clinical component. May be repeated up to 4 credits.

**NURS 5230. Seminar in Nursing Administration- Roles
3 Credits (3)**

Role preparation for the nurse administrator as manager, leader, collaborator and change agent. Synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration. May be repeated up to 3 credits.

Corequisite: NURS 5240.

**NURS 5240. Advanced Field Work in Nursing
1-3 Credits (1P)**

A practicum in Nursing Administration. Application of concepts from management and nursing to the clinical, educational, or community setting. Restricted to: MSN, DNP, PHD majors. May be repeated up to 12 credits.

Prerequisite: NURS 5210.

Corequisite: NURS 5230.

**NURS 5996. Special Topics
1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

**NURS 5997. Independent Study
1-10 Credits (1-10)**

Individual studies and directed research with prior approval of department head. May be repeated up to 20 credits.

**NURS 6110. Introduction to Population Health
1 Credit (1)**

This required course for the Doctor of Nursing Practice program prepares the student to implement specialty population-based disease prevention and health promotion activities to achieve national and international goals of improving worldwide health status. The course focuses on a spectrum of issues affecting health, which include emerging infectious diseases, emergency preparedness, disparities in health and healthcare services, and the impact of behavior and lifestyle choices on health.

Learning Outcomes

1. Analyze data to identify potential and emerging health hazards in individuals and communities.
2. Evaluate care delivery models to address disease prevention and population health.
3. Identify gaps in the care of individuals, aggregates, or populations.
4. Identify gaps in the care of individuals, aggregates, or populations.

**NURS 6120. Quality Improvement in Healthcare
3 Credits (3)**

This course prepares advanced practice nurses to be leaders of inter-professional teams engaged in the process of continuous quality improvement in healthcare settings. Healthcare quality improvement principles and practice will focus on improving patient care and outcomes, lowering costs, reducing health disparities, and increasing access to healthcare. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of the doctorally-prepared nurse in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Analyze the role of health policy and national standards in guiding quality improvement initiatives.

**NURS 6125. Evidence-Based Practice for Healthcare
3 Credits (3)**

This course is designed to prepare nurse practitioners and other advanced practice nurses with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. Restricted to: Family Nurse Practitioner; Psych/Mental Health Nursing; Nursing Practice; Family Nurse Practitioner Certificate; and Psych/Mental Health Nursing Certificate majors.

Prerequisite: NURS 6120.

Learning Outcomes

1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 6130. Epidemiology for Advanced Nursing Practice
2 Credits (2)

Emphasis is on the practical application of the principles of epidemiology in the measurement and evaluation of population health. Epidemiological literature will be critiqued and synthesized to evaluate population-based public health nursing problems. Issues related to disease surveillance, causation, genetic patterns, screening and social trends in population health will be examined. Use of existing data bases and technology programs are covered. Restricted to: NURP, NURS, NUSC majors. May be repeated up to 2 credits.

NURS 6135. Interdisciplinary Leadership and Role Development for Practice Excellence
3 Credits (3)

This required course prepares students for organizational and systems leadership and knowledge and skills critical to role development in independent and inter and intra-disciplinary practice. Content includes communication, conflict resolution, collaboration and negotiation, leadership, and team functioning to maximize success in the establishment of safe, effective patient-centered care in complex environments.

Learning Outcomes

1. Evaluate interdisciplinary care delivery models from a systems perspective using evidence-based findings.
2. Incorporate principles of specialty practice management, quality improvement, and interdisciplinary teamwork in order to meet the health needs of the specialty population served.
3. Analyze effective strategies for the management of ethical dilemmas, incorporation of sensitivity to diverse cultures, and elimination of health disparities incorporating appropriate communication techniques.
4. Differentiate among the multiple roles in advanced nursing practice with a focus on working effectively in inter-professional teams.
5. Evaluate leadership styles in a team environment in the analysis of complex practice and organizational issues.
6. Incorporate consultative and leadership skills with inter and intra-disciplinary teams to facilitate change using effective communication strategies.

NURS 6150. Advanced Anatomy
2 Credits (2)

This course presents an extensive exploration of human anatomy from a topographical and regional perspective. The knowledge gained in this course serves as a foundation for advanced clinical assessment for anesthesia practice, clinical decision-making, and patient management.

Learning Outcomes

1. Describe the regional organization and topography of anatomical structures within key clinical regions of the human body with a focus on neurovascular anatomy and internal organs.
2. Describe the structure and function the central nervous system and the distribution of all of the major peripheral nerves in the body.
3. Identify the relationship between palpable anatomical landmarks and the deep anatomy of the head, neck, thorax, abdomen, pelvis and limbs.
4. Identify major anatomical structures in the human body using radiographs, ultrasound, CT, MRI images.

NURS 6155. Advanced Physiology
4 Credits (4)

This course presents an extensive exploration of anatomy and physiology of the human body's organs and systems. Topics are covered from a molecular, cellular, tissue, organ, and system perspective. Individual differences in physiology as related to culture, gender, race, age, and genetics will also be covered. The knowledge gained in this course serves as a foundation for advanced clinical assessment, pharmacology, clinical decision-making, and patient management.

Learning Outcomes

1. Identify structures and normal physiologic functions of the human body organs and systems.
2. Demonstrate knowledge of the concept of homeostasis.
3. Summarize the complexities of normal human physiologic multi-system interactions
4. Recognize physiologic differences related to culture, gender, race, age, and genetics
5. Discuss how principles of normal physiology impact advance practice nursing care of individuals.

NURS 6210. Professional Roles for Advanced Practice Clinical Nursing
3 Credits (3)

This course will focus on providing an in depth understanding of the legal, historical, political, social, and ethical aspects of advanced practice nursing. Traditional and emerging roles for advanced practice nursing are examined. Students must be Admitted to the DNP program. Restricted to DNP majors. May be repeated up to 3 credits.

Prerequisite: NURS 6430 OR NURS 6520.

NURS 6215. Professional Aspects of Nurse Anesthesiology Practice
3 Credits (3)

This course examines professional role development of the nurse anesthetist with an emphasis on the history and evolution of nurse anesthesiology practice, as well as scope, standards, legal aspects, ethics, quality, and regulations. Professional advocacy topics and the business of anesthesiology practice will be appraised. This course also addresses the risks of the role related to wellness and substance use disorder. Cultural competence modules for healthcare workers will be completed during this course.

Learning Outcomes

1. Discuss the history and evolution of nurse anesthesiology practice.
2. Analyze the professional components of nurse anesthesiology practice, emphasizing scope, standards, legal aspects, ethics, and regulation.
3. Differentiate between state, national, and international anesthesia organization roles and functions.
4. Identify quality assessment tools in anesthesiology practice.
5. Compare various business models of anesthesia, reimbursement methods, payment policies, reimbursement, and nurse anesthesiology practice patterns.
6. Examine the impact of wellness and substance use disorder on anesthesia providers.
7. Demonstrate cultural awareness and sensitivity of patient background characteristics including, but not limited to race, ethnicity, socioeconomic status, age, gender and sexuality.
8. Examine professional advocacy and other selected current issues affecting nurse anesthesiology practice.

**NURS 6220. Advanced Pathophysiology for Clinical Nursing
3 Credits (3)**

In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

**NURS 6224. Diagnostic Reasoning and Advanced Health Assessment
3 Credits (3)**

This course is designed to assist students to refine history taking, psychosocial assessment and physical assessment skills. Content focuses on assessment of individuals throughout the lifespan. Emphasis is placed on detailed health history taking, differentiation, interpretation and documentation of normal and abnormal findings. Diagnostic reasoning skills are emphasized as students develop processes to formulate differential diagnoses for acute and chronic physical and mental illnesses in the primary care setting across the lifespan.

Prerequisite: NURS 6235.

Learning Outcomes

1. Analyze and use the most effective communication methods to obtain a health history and to develop a therapeutic relationship.
2. Differentiate variations in normal and abnormal health and physical data.
3. Explore processes of diagnostic reasoning and potential cognitive biases.
4. Using data from the health and physical assessment, formulate differential diagnoses for given physical and mental illnesses across the lifespan.
5. Demonstrate advanced clinical judgment by using data from the health and physical assessment to design and implement clinically safe and patient-focused interventions.

**NURS 6226. Advanced Health Assessment Practicum
1 Credit (1P)**

Assessment skills for advanced clinical practice. Emphasis on assessment of patients across the life span. May be repeated up to 3 credits.

Corequisite: NURS 6225.

Learning Outcomes

1. Conduct a comprehensive and systematic assessment of health and illness in complex situations.
2. Collect and interpret health data related to the health history, chief complaint, and history of the present illness.
3. Use effective communication methods to obtain a health history and to develop a therapeutic relationship
4. Assess variations in normal and abnormal health and physical data.
5. Document advanced clinical judgment by using data from the health and physical assessment to determine a health status.

**NURS 6230. Advanced Clinical Pharmacology
3 Credits (3)**

Principles of clinical pharmacology for advanced clinical practice. Focus on pharmacology as it relates to human physiology and pathophysiology across the lifespan. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

**NURS 6235. Advanced Pathophysiology for Nurse Anesthesiology
Practice****4 Credits (4)**

This course focuses on pathophysiology of diseases relevant to nurse anesthesiology practice. Evidence-based practice resulting from relevant research will be incorporated in discussions related to anesthesia management of patients with health status alterations. Students will utilize this information to build a foundation for anesthesia clinical reasoning and principles of nurse anesthesiology practice.

Learning Outcomes

1. Analyze the relationship between normal physiology and pathologic consequences produced by selected disease states.
2. Demonstrate understanding of selected biochemical, genetic, and cellular mechanisms that lead to common health alterations that occur in individuals across the lifespan.
3. Identify various pathologic alterations relevant to anesthesia practice.
4. Integrate the clinical application of pathophysiology into the practice of nurse anesthesiology.
5. Discuss the relationship between pathophysiology of various systems and anesthesia planning and management.

**NURS 6240. Advanced Health Assessment for Nurse Anesthesiology
Practice****3 Credits (3)**

This course focuses on development of knowledge and skills necessary to conduct comprehensive and focused health assessments for patients across the lifespan with special attention given to nurse anesthesiology practice. Principles of conducting detailed health histories, physical examinations, and diagnostic study interpretations will be featured. Students will obtain and document detailed culturally sensitive health histories and physical examinations. They will use critical thinking to identify and/or interpret pertinent diagnostic studies related to alterations in health patterns. Emphasis is placed on differentiation between normal and abnormal health history, physical assessment, and diagnostic findings.

Learning Outcomes

1. Demonstrate a systematic approach to the collection and documentation of data for health history and physical assessment while maintaining confidentiality and respecting privacy.
2. Collect and interpret health data related to the health history, history of the present illness, laboratory and other diagnostic findings.
3. Document relevant findings for both comprehensive and focused health histories and physical assessments.
4. Identify potential anesthesia risks based on patient health history, physical exam findings, and current literature.
5. Conduct and document a comprehensive preanesthesia evaluation to include health and surgical history, physical examination, and interpretation of diagnostic data using effective communication while maintaining confidentiality and respecting privacy.

**NURS 6245. Advanced Pharmacology for Nurse Anesthesiology Practice
3 Credits (3)**

This course builds upon the advanced clinical pharmacology course and is designed to provide an evidence-based in-depth foundation of pharmacology and its application to anesthesiology practice across the lifespan. The primary focus will be on topics such as pharmacodynamics, pharmacokinetics, pharmacotherapeutics, pharmacy, and toxicology of currently used anesthetic agents

Learning Outcomes

1. Identify general pharmacokinetic, pharmacodynamic, pharmacogenetic, and pharmacotherapeutic principles related to anesthetic agents and adjunct drugs
2. Discuss the uptake and distribution of primary anesthetic agents and adjunct drugs.
3. Summarize indications/contraindications for selected anesthetic agents and adjunct drugs.
4. Calculate accurate doses of selected anesthetic agents and adjunct drugs.
5. Review potential adverse effects and drug interactions of selected anesthetic agents and adjunct drugs.
6. Describe evidence-based anesthetic considerations of anesthetic agents and adjunct drugs used for various procedures and various patients across the lifespan with diverse comorbidities and demographics.

**NURS 6250. Healthcare Policy and Ethics
3 Credits (3)**

This course examines complex challenges faced in the US healthcare system for nurses in advanced practice roles within an ethical framework. Ethical, social, and political issues that affect the provision of health care, communities, and society are critically analyzed with an emphasis on interprofessional roles in health care. Concepts that support advocating for social justice, reducing healthcare disparities, improving quality, promoting ethical aspects of care, and cost containment are overarching themes in the course discussions and assignments. Students use self-reflection, case studies and presentations to apply ethical principles, develop healthcare policy recommendations to improve care access, and reduce disparities in professional practice and population health.

Learning Outcomes

1. Analyze the historical evolution of health care systems and their influence on the development of institutional, local, state, federal and international health policy.
2. Critique socioeconomic, legal, ethical, and political issues relevant to policymaking and provision of equitable, safe, and quality health care at the local, state, and national levels.
3. Assess health policies, infrastructure, financing, and complex systems in the US in contrast to other nations.
4. Critically analyze bioethical issues in clinical practice settings as they impact policy, disparities, advocacy, ethics, improved patient outcomes and reduced costs.
5. Synthesize the principle of human rights and ethics in conduct of health care research and policy design.
6. Interpret the value and importance of advanced practice nursing role(s) to policy makers, health care professionals, and consumers.

**NURS 6255. Innovations and Health Care Organizations
3 Credits (3)**

Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Restricted to: NURS, NUSC, NURP majors. May be repeated up to 3 credits.

**NURS 6260. Population Health and the Environment
3 Credits (3)**

This course will examine and evaluate prevention strategies, healthcare quality measures, diversity principles, and patient safety considerations related to population health. There is a focus on how environmental health can be integrated into nursing education, practice, research, and policy/advocacy efforts. Students will explore community, environmental, cultural, and socioeconomic dimensions of care as evidenced by completion of a community assessment.

Prerequisite: NURS 6110.

Learning Outcomes

1. Analyze theoretical frameworks/conceptual models for relevance to population health.
2. Analyze the impact of a population health focus on the health of individuals, families and communities.
3. Differentiate the impact of biologic factors, the natural environment, built environment and altered environment on health.
4. Describe the impact of discrimination, sexism, and racism on equity and inclusion in healthcare and on health.
5. Analyze the relationship between human health, animal health and ecosystem health.
6. Apply the principles of patient and community engagement for population health improvement
7. Discriminate between population growth, health and development as factors in global health.
8. Examine institutional, local/state/federal, and global policies that address the relationship between population health and the environment.

NURS 6265. Strategic and Financial Planning for Population Health Programs**3 Credits (3)**

This course explores the role of nurses in advanced nursing practice within a rapidly changing healthcare system. Theories of leadership, quality, risk outcomes, and financial structures for healthcare organizations are discussed providing a framework for change within advanced nursing practice specialties. Accounting, finance, and marketing principles are presented enabling students to complete a financial plan for an evidence based practice change.

Prerequisite: NURS 6270.

Learning Outcomes

1. Use the principles of population focused program planning, development, implementation, and evaluation to develop an evidence-based population focused strategy to address a health priority issue.
2. Analyze the potential influence of cultural, ethical, and public health policy issues when working with diverse populations.
3. Analyze aspects of organizational culture and planned change that may influence success of planned interventions.
4. Evaluate feasibility issues related to implementing planned interventions such as cost, time, and available resources.
5. Integrate principles of program evaluation to determine impact and sustainability of evidence-based interventions.
6. Analyze the impact of financial models on costs, quality and health outcomes.

NURS 6270. Clinical Data Management and Analysis**2 Credits (2)**

This required course provides students with the knowledge base to understand, collect, manage, and measure clinical data. Students will explore data collection and management processes, levels of measurement, basic statistics, and measurement for improvement in order to effectively use clinical data. Data entry exercises employed through analytical tools and statistical software packages will allow the students practice and apply the basic data management and analysis skills needed for the evaluation of clinical data and evidence-based practice.

Learning Outcomes

1. Apply principles of sound data collection and management.
2. Create a database to collect and aggregate data.
3. Apply levels of measurement.
4. Perform basic statistics including descriptive, parametric, and non-parametric statistics.
5. Perform basic analysis of aggregate population level data.
6. Use common tools (excel) and statistical software packages (SPSS) for data collection, entry, management, and analysis.

NURS 6305. Introduction to the DNP Project**1 Credit (1)**

This required course is designed to assist the student in exploring a clinical problem and selecting an area of interest within a practice specialization, and in demonstrating professional competencies related to an area of interest to begin foundational development of the DNP scholarly project. The student will document previously acquired abilities and competencies while developing an understanding of the DNP project process. Students will work towards selection of a setting (hospital, long-term, primary care or community health agency) where concepts, theories, and principles of leadership, administration, and management can be applied.

Learning Outcomes

1. Examine the role of the DNP in the development and implementation of evidence based change of practice projects.
2. Identify a DNP Project practice site and clinical advisor.
3. Develop a portfolio demonstrating expertise in the specialty area of interest and understanding of a clinical problem.

NURS 6307. DNP Project Practicum**1-3 Credits (1-3P)**

This leadership practicum courses provide for the development of a population health leader as demonstrated through the DNP project. The student will conduct an assessment of a population, community and/or organization where evidence-based leadership activities may be employed. Once a problem or issue is identified in the practice setting, the student will develop an evidence-based project designed to positively impact population-specific and/or patient care outcomes. After approval of the DNP project proposal, the student will implement an evidence-based project designed to positively impact population health and/or patient/client care outcomes. The culmination of the DNP project is evaluation and dissemination of the evidence-based changes. May be repeated up to 9 credits.

Learning Outcomes

1. Demonstrate competence in the role of population health leader who delivers advanced practice nursing, including educators, clinicians, administrators, and translators of research.
2. Execute the DNP Project that meets the needs of diverse populations
3. Collaborate with DNP committee and the organization to establish an intra- and inter-professional continuous quality improvement process for achievement of the desired outcomes
4. Exhibit consistent professional behavior, performance, accountability, and responsibility within a population health leadership role

NURS 6310. DNP Project I**1 Credit (1)**

This is the first in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this course, students will identify a problem in healthcare, explore the existing evidence and develop a preliminary proposal for a project that demonstrates synthesis of DNP coursework and lays the groundwork for future scholarship.

Prerequisite: NURS 6120 and NURS 6125.

Learning Outcomes

1. Systematically review the existing evidence pertaining to selected clinical problem, generating a written review of the existing evidence.
2. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
3. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
4. Defend the DNP project proposal in front of the student's project committee and submit to IRB

NURS 6320. DNP Project II**1 Credit (1)**

This is the second in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this course, students will have designed and defended a plan for implementation and evaluation of the proposed project, submitted an IRB application, and initiated the project upon obtaining IRB approval.

Prerequisite: NURS 6310.

Learning Outcomes

1. Execute the approved DNP project implementation and evaluation plan.
2. Develop a plan for local, regional and/or national dissemination of the DNP project outcomes as scholarly work.
3. Identify the DNP Essentials that are represented in the project and describe how the project addressed the requirement.

NURS 6330. DNP Project III**1 Credit (1)**

This is the third in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this semester, students will demonstrate the ability execute the proposed project plan. If additional time is needed to complete the proposed DNP project, the student must register for NURS 6340 in subsequent semesters until the project outcomes are successfully defended in front of the project committee.

Prerequisite: NURS 6320.

Learning Outcomes

1. Defend the DNP project outcomes in front of the student's project committee and a public audience.
2. Generate a comprehensive written paper (i.e., professional manuscript, white paper, or technical report) that outlines the DNP project problem statement, objectives, review of evidence, implementation, and outcomes.

NURS 6340. Clinical Scholarly Project**1-4 Credits (1-4)**

Building on the practice expertise of the DNP student, this series of credits is to provide the student with the opportunity to design an innovative clinical practice improvement project/program addressing an actual health care concern. Through mentored activities, the DNP student will identify, develop, implement, evaluate, and disseminate an independent analytic. Graded: S/U Grading (S/U, Audit). Students must be Admitted to the DNP program. Restricted to: NURP majors. May be repeated up to 4 credits.

NURS 6352. Integrated Care for Diverse Populations**2 Credits (2)**

This course examines integrated health care as an approach to health care delivery characterized by a high degree of collaboration and communication among health professionals. Students expand their knowledge of interprofessional competencies and learn the concepts of the development of comprehensive treatment plans to address the biological, psychological and social needs of the patient in diverse patients across care settings. The focus is on delivering behavioral or biomedical health interventions relevant to everyday clinical practice across disciplines and practice settings. There is a strong emphasis on feasible brief interventions in a fast-paced clinical context and on adapting interventions to each patient's unique biopsychosocial, socioeconomic, and cultural context.

Prerequisite: NURS 6410 or NURS 6510.

Learning Outcomes

1. Analyze the relationship between behavioral and biomedical health and cultural contexts, including an understanding of the common health/illness presentations;
2. Compare and contrast models of integrated health.
3. Develop a treatment plan for a given patient addressing the investigation and management of the patient's illness, and the personal and social issues to which the illness may give rise;
4. Identify strategies for communicating clearly and sensitively with patients and their families and with other health professionals;
5. Analyze inter-professional team members roles in collaboration and cooperation with other team members as an integral component of team function;

NURS 6405. Psychopharmacology for Advanced Practice**3 Credits (3)**

Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education. May be repeated up to 3 credits.

NURS 6410. PMHNP Across the Lifespan I**3 Credits (3)**

This is the first in a series of three didactic for the psychiatric mental health nurse practitioner (PMHNP) student. This course introduces the PMHNP student to the scope and standards of practice; legal and ethical issues; comprehensive psychiatric assessment and evaluation; developmental theories; and the theory and practice of psychotherapy. Emphasis is placed on individuals across the lifespan from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6411.

Learning Outcomes

1. Synthesize the current scientific evidence along with theoretical models for personality development into therapeutic interventions within a healthy environment.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems, based on current evidence and clinical practice guidelines.
4. Evaluate strategies to promote the negotiation of mutually acceptable and collaborative treatment plans.
5. Apply evidence-based findings to develop and improve practice.

NURS 6411. PMHNP Across the Lifespan I Practicum**3 Credits (3P)**

This is the first in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides the family psychiatric nurse practitioner student opportunities to work with a preceptor to gain advanced practice skills in individual therapies, comprehensive psychiatric evaluation, personality development concepts, dual diagnoses and psychotherapy principles; including management of health promotion, health maintenance and disease prevention activities. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6410.

Learning Outcomes

1. Utilize communication skills and ethical strategies to develop and terminate therapeutic relationships.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Demonstrate knowledge of psychotherapeutic theories and concepts by independently conducting psychotherapy with individuals with mental illness or at risk for mental health problems, under the supervision of a preceptor.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems.
5. Use current evidence and clinical practice guidelines in the assessment and management of patients across the lifespan.

NURS 6420. PMHNP Across the Lifespan II**3 Credits (3)**

This is the second in a series of three didactic courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. Emphasis is placed on working with families from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6410.

Corequisite: NURS 6421.

Learning Outcomes

1. Evaluate core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Identify age appropriate theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan.

NURS 6421. PMHNP Across the Lifespan II Practicum**3-4 Credits (3-4P)**

This is the second in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. The student gains knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. The course involves working with a preceptor to develop and implement comprehensive treatment plans that include psychotherapy and psychopharmacology in inpatient and/or outpatient settings. May be repeated up to 8 credits.

Prerequisite: NURS 6411.

Corequisite: NURS 6420.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Recognize cultural diversity, spiritual preferences, values, and beliefs to create a climate of patient-centered care demonstrating confidentiality, privacy, comfort, emotional support, mutual trust, and respect.
5. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
6. Demonstrate increasing independence in the application of supportive, psychodynamic principles, cognitive-behavioral and other evidence-based psychotherapy/-ies to both brief and long-term individual encounters, family therapy and group therapy.

NURS 6430. PMHNP Across the Lifespan III**1 Credit (1)**

This third course in the series of PMHNP didactic courses provides further knowledge and skills for the psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment. Emphasis will be placed on individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 5 credits.

Prerequisite: NURS 6420.

Corequisite: NURS 6431.

Learning Outcomes

1. Synthesize current scientific evidence, differential and diagnostic reasoning along with theoretical models for group dynamics into therapeutic interventions.
2. Apply theoretical concepts, evidence-based psychotherapeutic modalities, and knowledge of psychopharmacology to develop comprehensive treatment plans for psychiatric patients across the lifespan.
3. Evaluate the role of the advanced practice nurse in the management of evidence-based interventions with groups and individuals experiencing psychosocial and neurobiological disorders.

**NURS 6431. PMHNP Across the Lifespan III Practicum
3 Credits (3P)**

This third course in the series of PMHNP clinical courses provides further knowledge and skills for the psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment of patients with mental health illness. Emphasis will be placed on psychotherapeutic and psychopharmacologic treatment of individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 6 credits.

Prerequisite: NURS 6421.

Corequisite: NURS 6430.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Independently integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and/or families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
5. Demonstrate theoretical concepts, evidence-based psychotherapeutic modalities, and knowledge of psychopharmacology to independently develop, implement and document comprehensive treatment plans.

**NURS 6432. PMHNP Across the Lifespan Residency
2 Credits (2P)**

The nurse practitioner student will be expected to fully immerse in the role of the Psychiatric Mental Health Nurse Practitioner (PMHNP) with increasing levels of autonomy, under the supervision of qualified preceptors. Students will demonstrate efficacy in practice, management, and treatment of broad types of mental health issues that present in children, adolescents, adults and/or geriatric individuals and families in a variety of settings. The student will demonstrate the ability to utilize psychopharmacological and psychotherapeutic (individual, family and group) interventions in specialty or subspecialty clinical settings, particularly those that are of clinical relevance to the student's area of intended practice. In this course, the student will demonstrate proficiency in the PMHNP role in integrated healthcare settings. Students must complete psychiatric mental health clinical rotation hours treating patients across the lifespan while offering opportunities for board certification exam preparation. Restricted to Nursing majors. May be repeated up to 4 credits.

Prerequisite: NURS 6421.

Corequisite: NURS 6431.

Learning Outcomes

1. Fully integrate the mental health nurse practitioner role in the implementation of practice in diverse practice settings.
2. Provide high quality, safe, cost-effective, patient centered care recognizing cultural diversity and the patient or designee as a full partner in decision-making.
3. Appropriately diagnose, manage, and develop treatment plans for patients experiencing mental health care problems, to maximize the patient's health potential using psychosocial, psychopharmacologic and psychotherapeutic interventions.
4. Demonstrate the highest level of accountability for ethical professional practice.
5. Evaluate patient outcomes and responses, and modify the patient plan of care accordingly.
6. Participate in opportunities for board certification exam preparation

NURS 6450. Advanced Concepts in the Treatment of Substance Use Disorders**1 Credit (1)**

This course examines scope of practice, epidemiology, cultural issues, and common co-occurring psychiatric, medical and legal problems related to substance use disorders, including opioid use disorder. Students will review theories and research as the basis for psychometric screening and evidence-based interventions, including medication-assisted treatment for substance use disorders. Emphasis is placed on individuals across the lifespan from diverse populations. Consent of Instructor required.

Learning Outcomes

1. Demonstrate the significance of professionalism and self-awareness by maintaining professional, ethical and legal standards, preserving the integrity of the therapeutic process, demonstrating commitment to the health and well-being of individuals and society ethical practice, and upholding high personal standards of behavior.
2. Recognize addictive disorders as developmental biopsychosocial disorders using a model of interconnection encompassing neurobiology, genetic, medical and mental health co-morbidities, familial, social, environmental, cultural, spiritual influences as contributors of substance use disorders.
3. Apply an evidence-based approach to detecting substance use disorders by recognizing medical, psychological, social, and functional indicators of subclinical addiction disorders through use of validated standardized substance use disorder screening instruments, and accurately interpret screening results indicative of hazardous and harmful substance use. Integrate positive substance use screening results with therapeutic and counseling strategies appropriate to the patient's readiness to change, by assessing the patient's background, ethnicity, and belief system to accommodate and respect the values and attitudes of various cultures.
4. Recognize the indications, contraindications, duration and utilization of evidence-based medication-assisted treatment and pharmacotherapy for substance use disorders including medications for acute withdrawal and relapse prevention.
5. Diagnose substance use disorders and existing co-occurring mental health and/or medical disorders, and match appropriate level of care, secure consultation and referrals for specialty treatment of addiction and other medical and psychiatric conditions.

NURS 6506. Health Needs of Women and Children**3 Credits (3)**

The course will examine patient and family perspectives as well as health care system variables and societal issues affecting the organization and delivery of primary care for women, adolescent, and pediatric populations. Emphasis includes a focus on ways in which poverty, politics, racial and ethnic disparities affect the health of families, women, children, and adolescents. Content addresses comprehensive diagnosis and management of common health problems, including appropriate diagnostic procedures, laboratory tests, and follow-up care for patients with both acute and chronic conditions. There is a strong focus on health promotion, disease prevention, the care of underserved populations, and culturally competent care.

Prerequisite: NURS 6220, NURS 6225, NURS 6230.

Learning Outcomes

1. Analyze the etiology, pathophysiology, presentation, and prognosis of women and children's conditions as they present in clinical settings.
2. Assess the public health impact of clinical problems for both women and children in the community, including the epidemiology of common risk factors and early intervention strategies.
3. Synthesize scientific and evidence-based knowledge along with theory to promote health, prevent illness and treat common acute and chronic conditions of women and children.
4. Apply the principles of health care ethics to the care of women and children with an understanding of legal implications within the sociopolitical environment.
5. Formulate a plan to investigate and manage the health state of women and children taking into account the values and preferences of the patient and addressing the personal and social issues to which the health status may give rise.

NURS 6510. FNP Across the Lifespan I**3 Credits (3)**

This is the first in a series of three didactic courses for the family nurse practitioner (FNP) student. This course introduces the FNP student to the scope and standards of practice; legal and ethical issues; differential diagnosis; as well as the identification and management of specific symptoms and conditions. Emphasis is placed on individuals across the lifespan from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6511.

Learning Outcomes

1. Apply evidence-based knowledge and theory related to the prevention, diagnosis and management of selected common acute health problems in clients across the lifespan.
2. Plan collaborative case to assist clients and their families from diverse backgrounds to maximize functional health status
3. Formulate patient centered therapeutic plans based on holistic health assessment, risk reduction and safety for the treatment and prevention of select, uncomplicated and common, acute illnesses.
4. Evaluate the current use of professional values, leadership, and ethical/legal/policy standards in the implementation of the advanced practice role.

NURS 6511. FNP Across the Lifespan Practicum I**3-4 Credits (3-4P)**

This is the first in a series of three clinical courses for the family nurse practitioner (FNP) student. Working with a preceptor students will use advance skills in patient history taking, performing physical assessments, and interpreting laboratory and other test results. Development of a plan of care with health promotion components is also expected. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 8 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6510.

Learning Outcomes

1. Integrate, implement and evaluate evidence-based therapeutic interventions in complex acute care practice situations.
2. Develop and sustain therapeutic relationships with patients across the life span (child, adolescents, young adult, adult, older adult, seniors) and other professional to optimize patient-centered outcomes.
3. Demonstrate advanced clinical judgment based on current standards of practice.
4. Use clinical judgment, systems thinking, and accountability to provide evidenced based care to patients across the lifespan.
5. Synthesize knowledge of acute and chronic illness, pharmacological interventions, legal and ethical principles and the social determinants of health in the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.

NURS 6520. FNP Across the Lifespan II**3 Credits (3)**

This is the second in a series of three didactic courses for the family nurse practitioner (FNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in the differential diagnosis and management of acute and chronic diseases. Emphasis is placed on individuals across the lifespan from diverse populations. Building on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. May be repeated up to 6 credits. NURS 6511.

Prerequisite: NURS 6510.

Corequisite: NURS 6521.

Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into immersion in practice decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Evaluate the relationships between access, cost, quality, and safety and their influence on health care.

NURS 6521. FNP Across the Lifespan II Practicum**3-4 Credits (3-4P)**

This is the second in a series of three clinical courses for the family nurse practitioner (FNP) student. This course builds on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. This course involves working with a preceptor to refine skills in assessment and differential diagnosis as well as the development and implementation of comprehensive treatment plans, that include referrals to other specialties and services. Students are expected to work within Integrated Health Care settings for a minimum of 64 hours of practicum. May be repeated up to 8 credits.

Prerequisite: NURS 6510, NURS 6511.

Corequisite: NURS 6520.

Learning Outcomes

1. Apply conceptual frameworks to and compare strategies for risk analysis and reduction, screening, disease and injury prevention, and health promotion across the life span.
2. Integrate relevant research findings in management of selected health care conditions across the life span.
3. Use the principles of case management process to coordinate effective therapeutic interventions, referrals, and collaboration with other health care providers for clients/patients with chronic illness across the life span.
4. Demonstrate cultural competence related to the individual's ethnicity, culture and lifestyle when considering prevention strategies or developing the health promotion and disease management plan for chronic conditions across the life span.
5. Analyze client and patient outcomes to identify the effectiveness of treatment, the need for change, and the health status of client/patient across the life span in an integrated care setting.
6. Apply inter-professional competencies in addressing integrated health needs of patients across the lifespan.

NURS 6530. FNP Across the Lifespan III**1 Credit (1)**

This is the final didactic course for the family nurse practitioner (FNP) student. The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common acute and chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. This course includes preparation for the FNP board certification exam. May be repeated up to 5 credits.

Prerequisite: NURS 6520, NURS 6521.

Corequisite: NURS 6531.

Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into clinical decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.
5. Use self-reflection to evaluate progress in professional development as an integral member of the interprofessional team.
6. Integrate ethical principles in decision-making and demonstrate core professional values in the implementation of the nurse practitioner role.

NURS 6531. FNP Across the Lifespan III Practicum**3-4 Credits (3-4P)**

This is the final clinical course for the family nurse practitioner (FNP) student. In this course, the student works with a preceptor to develop mastery of skills required to assess, diagnose and manage acute and chronic conditions in primary care settings. Advancement of knowledge and skills attained through previous practicum experiences, as well as this final course, produces a capable, qualified provider, who will transition into a safe, novice, primary care nurse practitioner. May be repeated up to 8 credits.

Prerequisite: NURS 6521.

Corequisite: NURS 6530.

Learning Outcomes

1. Apply theoretical concepts of patient-centered care with emphasis on health promotion, disease prevention, guidance/counseling, disease management, and palliative care during developmental transitions and life-style adjustments.
2. Incorporate primary/secondary prevention guidance into comprehensive treatment plans for patients across the lifespan.
3. Integrate history, physical examination laboratory and other test data with knowledge of pathophysiology of acute and chronic diseases/conditions to develop appropriate differential diagnoses.
4. Identify pharmacological interventions in the treatment and management of illness for diverse populations.
5. Integrate evidence-based clinical guidelines into the diagnosis and management of illness in patients across the lifespan.
6. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.

NURS 6610. Nurse Anesthesiology Principles I**3 Credits (3)**

This is the first of four sequential nurse anesthesiology principles courses and introduces the student to advanced nursing practice in anesthesia with integration of theoretical perspectives from anatomy, physiology, physics, chemistry, and related mathematics. This course focuses on the development of foundational knowledge to deliver safe, effective anesthesia care across the lifespan. Emphasis is on perioperative preparation, management, and evaluation of the patient, anesthetizing area, and equipment.

Learning Outcomes

1. Review fundamentals of safe evidence-based anesthesia practice related to anesthesia techniques, airway management techniques, perioperative patient/anesthetizing area preparation, anesthesia planning, safety measures, appropriate use of equipment and monitoring devices, and anesthesia complications
2. Demonstrate a comprehensive equipment check and proper utilization and/or interpretation of anesthesia delivery systems, airway equipment, monitoring devices, communication techniques, documentation, and patient positioning.
3. Assess patient fluid status and calculate, initiate, and manage fluid/blood component therapy.
4. Examine chemistry, physics, biochemistry, and imaging principles and their relationship to anesthesia.
5. Differentiate between acute and chronic pain management based on the neuroscience of pain.
6. Integrate anesthesia research and best practices related to basic anesthesia care, anesthesia equipment, technology, and pain management into anesthesia planning and delivery.

NURS 6620. Nurse Anesthesiology Principles II**3 Credits (3)**

This is the second of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for a variety of patients undergoing a variety of procedures such as intraabdominal, extrathoracic, neck, extracranial, orthopedic, perineal, pelvic, laser, non-operating room, and ambulatory. This course also focuses on providing students with a foundation to incorporate safe, evidence-based regional anesthesia techniques, including ultrasound-guided principles, into their clinical practice. Enhanced recovery after anesthesia and hypotensive techniques will be examined.

Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing a variety of surgical procedures.
2. Describe the indications and benefits of neuraxial and peripheral nerve blockade for diverse populations, as well as management of associated complications.
3. Identify via ultrasound key anatomy relevant to peripheral nerve blockade and demonstrate proper approach to performing common neuraxial and peripheral nerve blockade techniques.
4. Discuss anesthesia techniques, considerations, and complications (and their management) related to a variety of common procedures.
5. Explain patient selection, preparation, and monitoring needs of patients undergoing common procedures, enhanced recovery after surgery, hypotensive, and/or regional techniques.
6. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for patients undergoing common procedures and/or regional anesthesia techniques.

NURS 6630. Nurse Anesthesiology Principles III**3 Credits (3)**

This is the third of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for special populations across the lifespan including neonatal, pediatric, obstetric, geriatric, and obese patients.

Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for special populations across the lifespan undergoing a variety of surgical procedures.
2. Examine common anesthesia techniques utilized for special populations across the lifespan undergoing a variety of procedures.
3. Identify modifications required for anesthesia planning and management of special populations across the lifespan related to their physiology, comorbidities, and congenital anomalies as applicable.
4. Discuss management of anesthesia complications related to special populations across the lifespan.
5. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for special populations across the lifespan.

NURS 6640. Nurse Anesthesiology Principles IV**3 Credits (3)**

This is the final of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for more complex procedures including thoracic, vascular, neuroskeletal, diagnostic/therapeutic, trauma, burns, organ procurement/transplantation, and other pertinent procedures.

Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing a variety of complex procedures.
2. Identify common comorbid conditions of patients undergoing complex procedures.
3. Examine anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.
4. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for diverse patients undergoing a variety of complex procedures.

NURS 6710. Nurse Anesthesiology Clinical Residency I**3 Credits (3P)**

This is the first of six clinical residency courses and provides students with the opportunity to begin developing the advanced nursing practice role in anesthesiology. Students are expected to integrate didactic knowledge learned in previous courses and co-requisite courses into perianesthesia care of the patient. Students begin to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures with guidance.

NURS 6720. Nurse Anesthesiology Clinical Residency II 3 Credits (3P)

This is the second of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in Clinical Residency I and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students progressively assume more responsibility for patients as they gain skills and knowledge.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures with minimal guidance.

NURS 6730. Nurse Anesthesiology Clinical Residency III 4 Credits (4P)

This is the third of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures with minimal guidance.

NURS 6740. Nurse Anesthesiology Clinical Residency IV 4 Credits (4P)

This is the fourth of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services autonomously to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure
3. Autonomously administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures.
4. Autonomously demonstrate basic anesthesia skills/techniques and incorporate new skills.
5. Autonomously identify perianesthesia patient physiologic alterations and/or equipment alterations and initiate appropriate management utilizing evidence-based problem solving and decision making.
6. Autonomously provide anesthesia services in a rural community.
7. Use effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
8. Demonstrate integrity, ethics, honesty, and accountability in professional interactions.

**NURS 6750. Nurse Anesthesiology Clinical Residency V
4 Credits (4P)**

This is the fifth of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Independently administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures.
4. Independently demonstrate basic anesthesia skills/techniques and incorporate new skills.
5. Independently identify perianesthesia patient physiologic alterations and/or equipment alterations and initiate appropriate management utilizing evidence-based problem solving and decision making.
6. Independently provide anesthesia services in a rural community.
7. Use effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
8. Demonstrate integrity, ethics, honesty, and accountability in professional interactions.

**NURS 6760. Nurse Anesthesiology Clinical Residency VI
4 Credits (4P)**

This is the final clinical residency course and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Conduct a comprehensive history and physical assessment and formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Independently administer safe evidence-based, culturally competent perianesthesia care to a variety of patients undergoing surgical and medical procedures.
4. Independently demonstrate basic anesthesia skills/techniques and incorporate new skills.
5. Independently identify perianesthesia patient physiologic alterations and/or equipment alterations and initiate appropriate management utilizing evidence-based problem solving and decision making.
6. Independently provide anesthesia services in a rural community.
7. Use effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
8. Demonstrate integrity, ethics, honesty, and accountability in professional interactions.

**NURS 6770. Rural Health Anesthesiology Seminar
2 Credits (2)**

This course focuses on unique issues and challenges surrounding the provision of nurse anesthesiology services in rural communities. Topics covered include working with scarce resources, needs of individuals/populations living in rural communities, regulatory issues, health policy, reimbursement practices, cultural issues, technology, and local/state/federal aspects that impact rural nurse anesthesiology practice.

Learning Outcomes

1. Define unique needs of individuals and/or populations living in rural communities.
2. Identify challenges of working with scarce resources.
3. Discuss regulatory, policy, reimbursement, and cultural issues unique to rural nurse anesthesiology practice.
4. Illustrate local, state, and/or federal issues that impact rural nurse anesthesiology practice.

NURS 6771. Anesthesiology Integration/Clinical Correlation I
2 Credits (2)

This course is the first of a two-course sequence and is designed to further develop critical thinking skills and foster continued integration of theoretical knowledge into clinical practice. Clinically relevant evidence-based research and anesthesia topics will be presented by students and faculty. This course also includes student participation in discussion of clinical experiences and case presentations. Students will critically analyze, synthesize, and evaluate the knowledge gained in all previous nurse anesthesiology courses in preparation for the comprehensive exam, national certification examination, and clinical practice

Learning Outcomes

1. Demonstrate the ability to critically review pertinent literature and its application to clinical practice.
2. Deliver case-based presentations that incorporate current evidence-based best practices and culturally relevant information.
3. Synthesize knowledge gained from previous nurse anesthesiology coursework.
4. Analyze performance on the comprehensive exam.
5. Create an action plan to pass the National Certification Exam

NURS 6772. Anesthesiology Integration/Clinical Correlation II
2 Credits (2)

This course is the second of a two-course sequence and continues to further develop critical thinking skills and foster continued integration of theoretical knowledge into clinical practice. Clinically relevant evidence-based research and anesthesia topics will be presented by students and faculty. This course also includes student participation in discussion of clinical experiences and case presentations. Students will continue to critically analyze, synthesize, and evaluate the knowledge gained in all previous nurse anesthesiology courses in preparation for the national certification examination and clinical practice.

Learning Outcomes

1. Demonstrate the ability to critically review pertinent literature and its application to clinical practice.
2. Deliver case-based presentations that incorporate current evidence-based best practices and culturally relevant information.
3. Demonstrate consistent professional growth and development through discussion, presentation, interaction, and individual and/or group participation.
4. Complete the student self-evaluation of graduate standards form.
5. Implement the previously created action plan to pass the NBCRNA NCE and revise it as needed.

NURS 6990. Advanced Practice Nursing Immersion
1-4 Credits (1-4)

Practicum experience for advanced practice students. Focus will be on a practice issue chosen by the student for further development as an evidence-based doctoral project. Clinical practice hours as needed to meet DNP requirements. Up to 24 credits may be completed by student. Restricted to: NURP majors. May be repeated up to 24 credits.

Prerequisite: NURS 6220, NURS 6530 or enrollment in post-masters track.

NURS 6993. Doctoral Nursing APRN Seminar
1 Credit (1P)

Seminar to build APRN clinical skills, consisting of a 32-40 hour on-site immersion with skills labs and Objective Structured Clinical Evaluation using standardized patients that are used as formative and summative evaluation. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6224.

Learning Outcomes

1. Apply clinical decision making skills to diagnose and treat given patient cases in area of specialty.
2. Integrate screening and diagnostic tools into diagnosis and treatment of given patient cases in area of specialty.
3. Use advanced health assessment skills to differentiate between normal, variations of normal and abnormal findings.
4. Develop skills in the interpretation of commonly used diagnostic tests in management of patient conditions in area of specialty.
5. Perform procedures commonly used in the treatment of patients in area of specialty.

NURS 6997. Independent Study
1-6 Credits (1-6)

Individual studies and directed research with prior approval of department head. May be repeated up to 12 credits.

NURS 7000. Doctoral Dissertation
1-9 Credits (1-9)

Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits. May be repeated up to 30 credits.

Learning Outcomes

1. Varies

NURS 999. Practical Nursing Requirements Completed
99 Credits

A phantom course created to indicate a student has met Practical Nursing requirements. Used to indicate this in academic history to replace an administrative message not converted from SOLAR to VISTAS. 01/97 May be repeated up to 99 credits.

Learning Outcomes

1. N/A

NUTR-NUTRITION

NUTR 2110. Human Nutrition

3 Credits (3)

This course provides an overview of nutrients, including requirements, digestion, absorption, transport, function in the body and food sources. Dietary guidelines intended to promote long-term health are stressed.

Learning Outcomes

1. Evaluate sources of nutrition information for reliability
2. Identify elements of a nutritious diet
3. Describe the digestion, transport, and absorption of nutrients
4. Describe the importance of nutrition in weight control and health
5. Identify nutritional needs as they relate to the life cycle and performance
6. Describe behavior modification techniques that promote good health
7. Evaluate popular nutrition trends for scientific accuracy and effectiveness
8. Develop skills in the planning and assessing of healthy meal plans
9. Describe the role of food choices in the development of chronic disease 1
10. Describe the role of food in the promotion of a healthful lifestyle

NUTR 2120. Seminar I - Becoming a Nutrition Professional

1 Credit (1)

This course will introduce students to the field experience, careers, and professions in nutrition. This course is required for students pursuing a Didactic Program in Dietetics verification statement. May be repeated up to 1 credits. Consent of Instructor required. Restricted to: HNDS majors.

Learning Outcomes

1. Describe career options within the fields of Nutrition Dietetics.
2. Outline the HNDS field experience process.
3. Explain the educational pathways in HNDS.
4. List requirements for admission into the HNDS Dietetics pathway.
5. Begin an HNDS student portfolio.
6. Discuss the importance of personal responsibility accountability

NUTR 3110. Nutrition Throughout the Lifecycle

3 Credits (3)

Relationship of the stages of the human life cycle to changes in nutrient need. Consent of Instructor required.

Prerequisite(s): NUTR 2110.

Learning Outcomes

1. Understand the value of collaborative work in nutrition care of individuals.
2. Compare and contrast the physiological, behavioral, and psychosocial factors associated with each life stage that affect nutritional status.
3. For each life cycle stage, create a nutritionally adequate menu that meets key nutrient needs.
4. Culturally appropriate evidence-based interventions to address common nutrition-related conditions experienced in each lifecycle stage.
5. Utilize the Nutrition Care Process to complete a nutrition assessment.

NUTR 3120. Food for Health

4 Credits (4)

This course is designed to provide students the opportunity to learn about the intersection of nutrition and health in terms of food and diet. Students will be introduced to basic concepts within nutrition education, nutrition communication, nutrition and health and food culture. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): NUTR 3110. Prerequisite(s): NUTR 2110, FSTE 2110G, HRTM 2120.

Learning Outcomes

1. Complete nutritional analysis of a recipe/meal.
2. Modify traditional recipes to improve nutritional value and/or meet standards of a therapeutic diet.
3. Explain cultural and religious considerations when planning menus for diverse groups.
4. Critically evaluate and modify recipes to meet the needs of various ethnic, religious, and special populations.
5. Develop and conduct a hands-on nutrition education for a target group to teach healthy eating skills.

NUTR 3710. Food Systems & Policy in Dietetics

3 Credits (3)

This course introduces students to food and nutrition policy issues, institutions, and stakeholders and their impacts on public health, sustainability, and the practice of dietetics in the US. The course will examine policy development and the roles of federal agencies, private firms, non-governmental organizations, and the media in food and nutrition policy. It will also examine international perspectives on food and nutrition policies and programs used to support global nutrition, health promotion, and wellness.

Prerequisite(s): Junior standing, NUTR 3110, NUTR 3120.

Learning Outcomes

1. Discuss the economic, political, social, and cultural factors that influence US food and nutrition policies and impact national food systems and population health.
2. Identify the psychological, social, cultural, and environmental factors that influence food choices, eating behaviors, and nutrition-related practices.
3. Describe the processes and major players involved in US food and nutrition policy development, implementation, monitoring/evaluation, and regulation.
4. Recognize the influence of food and nutrition policy on the practice of dietetics.

NUTR 3750. Applied Nutrition Research**3 Credits (3)**

This course will introduce students to various types of nutrition research and equip them to locate and critique nutrition and dietetics research articles. Research analysis skills will then be applied to a review of the current literature on a nutrition topic and applied to dietetics practice. May be repeated up to 3 credits.

Prerequisite: MATH 1350G (OR A ST 311); NUTR 3110.

Learning Outcomes

1. Recall the various research methods, study designs, and statistical analyses used in nutrition research.
2. Compare and contrast research methods and analyses in nutrition research.
3. Analyze nutrition research for appropriateness of the methods and analyses.
4. Evaluate nutrition research to form sound, ethical conclusions and practice recommendations.

NUTR 3996. Special Topics**1-4 Credits (1-4)**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): Junior or Senior standing, consent of instructor.

Learning Outcomes

1. Develop foundational knowledge in a specialized area of dietetics practice.

NUTR 4110. Advanced Nutrition**3 Credits (3)**

Application of biochemistry and physiology to nutrition. May be repeated up to 3 credits. **Prerequisite(s):** BIOL 2221, (OR A ST 311); NUTR 3110

Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercising or fasting.

NUTR 4205. Nutrition Communication and Education**3 Credits (3)**

In this course, HNDS students learn about the foundation, design, and delivery of nutrition communication and nutrition education. Students will learn ways to develop audience-focused communication and learning assessment. This course will cover the communication methods used in all facets of the nutrition and dietetics field including oral presentations, writing, video, food photography, and food demonstrations. Students will utilize a large variety of channels to communicate and educate different target audiences.

Prerequisite: NUTR 3110.

Learning Outcomes

1. Identify a minimum of four reliable sources of nutrition information.
2. Interpret and clearly communicate evidence-based nutrition information.
3. Evaluate the application of behavior change theories and models to nutrition communications.
4. Adapt nutrition communication and education to target specific cultural and age groups.
5. Develop a nutrition education lesson plan with SMART learning objectives, learning activities, and learning assessments.

NUTR 4207. Nutrition Services**3 Credits (3)**

In this course, HNDS Dietetic students will learn about the promotion and payment of nutrition services along with aspects related to reimbursement and partnering with allied professionals. The HNDS Dietetics students will also engage in clinical and community nutrition field experiences. This course will provide HNDS Dietetic students with the opportunity to assess their knowledge of professional competencies within the field of dietetics. Restricted to students with senior standing within the Dietetics Option of the HNDS major.

Learning Outcomes

1. Compare best practice guidelines to actual practice in the provision of nutrition services within community settings.
2. Explain at least two processes in delivering quality food and nutrition services.
3. Identify private and public healthcare funding sources.
4. Explain Medicare, Medicaid, and private payer coverage for medical nutrition therapy.
5. Discuss referrals, primary care partnership and promoting nutrition services.
6. Describe best practices, resources and guidelines related to the reimbursement for nutrition services.
7. Compare best practice guidelines to actual practice in the provision of nutrition services within clinical nutrition settings.
8. Evaluate the content of the Commission on Dietetic Registration RDN credentialing exam.

NUTR 4210. Community Nutrition**3 Credits (3)**

Overview of the practice of community nutrition. Includes program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Same as NUTR 5210.

Prerequisite: NUTR 3110, NUTR 3710.

Learning Outcomes

1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 4220. Food Service Organization and Management**3 Credits (3)**

Personnel, financial and general management in institutional and commercial food service operations.

Prerequisite: HRTM 2120.

Learning Outcomes

1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and scenarios.
4. Evaluate a nutrition and foodservice budget and interpret financial data.

NUTR 4230. Medical Nutrition Therapy I**3 Credits (3)**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics.

Prerequisite: NUTR 4110, BCHE 341.

Corequisite: NUTR 4230; NUTR 4233.

Learning Outcomes

1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 4230L. Medical Nutrition Therapy I Lab**1 Credit (1P)**

Supplements NUTR 4230. Students will perform nutrition assessments, nutrition focused physical exams, apply medical nutrition therapy-based interventions and practice patient discharge education for specific disease states. Elements of pathology and biochemistry of nutrition-related conditions are integrated into course topics. Restricted to: HNDS majors.

Corequisite(s): HNDS 4230.

Learning Outcomes**NUTR 4233. Nutrition Counseling and Education****3 Credits (3)**

This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education.

Prerequisite: NUTR 3110; FCSC 348.

Learning Outcomes

1. Evaluate nutrition counseling strategies tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.
5. Develop and present a nutrition education lesson based on current nutrition research.

NUTR 4235. Entering the Field of Dietetics**1 Credit (1)**

Students will develop professional materials that will be used in their future careers including a personal statement, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered. Restricted to: HNDS majors. Students must be a Senior to enroll.

Prerequisite/Corequisite: NUTR 4210.

Learning Outcomes

1. Students will develop professional materials that will be used in their future careers including a personal statement, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered

NUTR 4240. Medical Nutrition Therapy II**3 Credits (3)**

Continuation of NUTR 4230.

Prerequisite: NUTR 4230.

Corequisite: NUTR 4240L.

Learning Outcomes

1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process Model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 4240L. Medical Nutrition Therapy II Laboratory**1 Credit (1P)**

Supplements NUTR 4240. Students will apply medical nutrition therapy to specific disease states with special emphasis on writing nutrition support orders and learning to utilize nutrition support equipment. Students will learn and apply advanced nutritional therapies and patient management strategies. Restricted to: HNDS majors.

Corequisite(s): HNDS 4240.

Learning Outcomes

1. Calculate nutrition support recommendations and document orders in the patient's medical chart.
2. Demonstrate safe use of nutritional support equipment.
3. Master use of the Nutrition Care Process in case-based and simulated patient scenarios to conduct nutrition assessments and implement evidence-based interventions.
4. Critically evaluate lab values and client anthropometric data.
5. Select therapeutic diets for the treatment of medical conditions and their symptoms.

NUTR 4565. Field Experience Community Nutrition**1-8 Credits (1-8)**

Experience working with nutritional problems of individual families of all socioeconomic and age levels and with agencies concerned with community nutrition. Practical experience with supervision by resident faculty as well as supervisor at the work site. Performance at work site graded in accordance with university standards. May be repeated up to 8 credits. Consent of Instructor required.

Prerequisite(s): Senior standing, NUTR 4210, consent of instructor.

Learning Outcomes

1. Apply dietetics knowledge to practice in various community settings.
2. Develop a field experience portfolio highlighting the development of community nutrition knowledge and skills.
3. Compare and contrast the responsibilities of Registered Dietitians in various community practice organizations.

NUTR 4991. Special Problems**1-4 Credits (1-4)**

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits. May be repeated up to 8 credits. Consent of Instructor required.

Prerequisite(s): Junior or Senior standing.

Learning Outcomes

1. Develop specialized knowledge and competencies in a selected nutrition and dietetics subject area.

NUTR 5110. Graduate Studies in Advanced Nutrition**3 Credits (3)**

Covers biochemistry and physiology applied to nutrition. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. Crosslisted with: NUTR 4110.

Prerequisite(s)/Corequisite(s): NUTR 3110. Student must be classified as a Graduate student to enroll in this course, BIOL 2221, BCHE 341, and NUTR 2110, or consent of instructor.

Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercise or fasting.

NUTR 5150. Orientation to Dietetic Internship**3 Credits (3)**

Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. Assembly of dietetic intern portfolio that will be kept throughout dietetic internship.
2. Readiness to begin supervised practice rotations.
3. Understanding of steps and processes to successfully complete requirements of dietetic internship and Masters of Science in Family Consumer Sciences.
4. Upon completion of the course, students will be able to understand the importance of evidence-based information, research ethics, the Code of Ethics of the Profession of Dietetics, and the basic structure of an IRB proposal.

NUTR 5210. Graduate Study in Community Nutrition**3 Credits (3)**

Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. May be repeated up to 3 credits. Crosslisted with: NUTR 4210.

Prerequisite(s): Graduate student, NUTR 3110, NUTR 3710, NUTR 3750, or consent of the instructor.

Learning Outcomes

1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state-level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data, and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 5220. Graduate Studies in Food Service Organization and Management**3 Credits (3)**

Personnel, financial and general management in institutional and commercial food service operations. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4220. May be repeated up to 3 credits.

Prerequisite(s): Graduate Students; HRTM 2120, NUTR 3120, or consent of instructor.

Learning Outcomes

1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing, and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and management practices of a specific food service establishment.
4. Apply management theories and principles to quality assurance and human resource case scenarios.
5. Evaluate a nutrition and food service budget and interpret financial data.

NUTR 5230. Graduate Studies in Medical Nutrition I**3 Credits (3)**

Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond NUTR 4230 required. May be repeated up to 3 credits. Crosslisted with: NUTR 4230.

Prerequisite(s): Graduate student, NUTR 3110, NUTR 4110, BIOL 2225 or BIOL 2221, or consent of instructor.

Learning Outcomes

1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 5233. Graduate Studies in Nutrition Counseling & Education**3 Credits (3)**

This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education. Additional assignments beyond NUTR 4233 required. May be repeated up to 3 credits. Crosslisted with: HNDS 4233.

Prerequisite(s)/Corequisite(s): NUTR 5230. Students must be classified as a Graduate student to enroll in this course, NUTR 2110, NUTR 3110, FCSC 348.

Learning Outcomes

1. Evaluate nutrition counseling strategies and tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.
5. Develop and present a nutrition education lesson based on current nutrition research.

NUTR 5240. Graduate Studies in Medical Nutrition Therapy II**3 Credits (3)**

Continuation of HNDS 546. May be repeated up to 3 credits. Crosslisted with: NUTR 4240.

Prerequisite(s): Graduate student, NUTR 5230 and NUTR 4230L or consent of instructor.

Learning Outcomes

1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 5610. Dietetic Intern Seminar**1 Credit (1)**

Portfolio development for dietetic interns during supervised practice rotations. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.
3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 6: Incorporate critical-thinking skills in overall practice.
9. CRDN
10. 1: Practice in compliance with current federal regulations and state statutes and rules, as applicable and in accordance with accreditation standards and the Scope of Nutrition and Dietetics Practice and Code of Ethics for the Profession of Nutrition and Dietetics.
11. CRDN
12. 2: Demonstrate professional writing skills in preparing professional communications.

NUTR 5620. Dietetic Internship: Supervised Practice in Community Nutrition**1-8 Credits (2-6P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in community nutrition to include an emphasis in Cooperative Extension Service. Dietetic interns work under the the guidance of faculty and community nutrition professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Evaluate the operation of Cooperative Extension Service nutrition programs in the areas of policies and procedures. 1
19. CES
20. Develop and deliver nutrition presentations to client/consumer audiences on various topics related to client/consumer needs. 1
21. CES
22. Ensure cultural relevancy and appropriateness of nutrition education. 1
23. CES
24. Assess educational needs and provide nutrition counseling based on individual needs, knowledge, medical needs, and socioeconomic status.

NUTR 5630. Community Nutrition for Dietetic Interns**3 Credits (3)**

Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Ensure cultural relevancy and appropriateness of nutrition education.

NUTR 5640. DI SUP PRACT FS MGT**1-5 Credits (2-10P)**

Provides dietetic interns with a minimum of 300 clock hours of supervised practice in foodservice management. Dietetic interns work under the guidance of faculty and foodservice management professionals. Students must complete a total of 4 credit hours of NUTR 5640. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

NUTR 5650. Foodservice Management for Dietetic Interns**3 Credits (3)**

Advanced topics in foodservice systems management to include business planning and marketing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 2: Demonstrate professional writing skills in preparing professional communications.
3. CRDN
4. 15: Practice and/or role play mentoring and precepting others.
5. CRDN
6. 4: Design, implement and evaluate presentations to target audiences.
7. CRDN
8. 3: Demonstrate active participation, teamwork and contributions in group setting.
9. CRDN
10. 7: Apply leadership skills to achieve desired outcomes.
11. CRDN
12. 8: Demonstrate negotiation skills.
13. CRDN
14. 4: Apply current informatics technology to develop, store, retrieve and disseminate information and data.
15. CRDN
16. 6: Analyze quality, financial and productivity data for use in planning.
17. CRDN
18. 7: Conduct feasibility studies for products, programs, or services with consideration of costs and benefits.
19. CRDN
20. 8: Develop a plan to provide or develop a product, program, or service that includes a budget, staffing needs, equipment and supplies.

**NUTR 5660. Dietetic Internship: Supervised Practice in Clinical Dietetics
1-8 Credits (2-16P)**

Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 4 Function as a member of interprofessional teams.
5. CRDN
6. 11 Show cultural competence/sensitivity in interactions with clients, colleagues and staff.
7. CRDN
8. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
9. CRDN
10. 2 Conduct nutrition focused physical exams.
11. CRDN
12. 3 Demonstrate effective communication skills for clinical and customer services in a variety of formats

**NUTR 5670. Nutrition Care Process for Dietetic Interns
3 Credits (3)**

Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of Instructor required.

Prerequisite(s): Acceptance into Dietetic Internship. Restricted to: HNDS majors.

Learning Outcomes

1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.
3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and diet.
7. CRDN
8. 4 Evaluate emerging research for application in dietetics practice.
9. CRDN
10. 2 Demonstrate professional writing skills in preparing professional communication. Perform the nutrition care process and use standardized nutrition language for individuals, groups, and populations of differing ages and health status, in a variety of settings.
11. CRND
12. 2 Conduct nutrition focused physical exams.

**NUTR 5680. Review Course for National RD Exam
3 Credits (3)**

Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: exclude HNDS majors.

Prerequisite(s): Acceptance into Dietetic Internship.

Learning Outcomes

1. Demonstrate readiness to take the National Registration Examination for Dietitians.
2. Completion of all requirements of the NMSU Dietetic Internship.
3. Completion of all requirements to receive a Master of Science in Family Consumer Sciences from New Mexico State University

**NUTR 5991. Special Research Programs
1-4 Credits (1-4)**

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree. May be repeated up to 6 credits.

Prerequisite(s): Graduate Student.

Learning Outcomes

1. Develop analytical or experimental research skills in the areas of human nutrition and dietetics.

**NUTR 5996. Special Topics
1-4 Credits (1-4)**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Prerequisite(s): Graduate student.

Learning Outcomes

1. Evaluate issues surrounding advanced nutrition and dietetics topics.

OATS-OFFICE ADMINISTRATION TECHNOLOGY SYSTEMS

**OATS 101. Keyboarding Basics
3 Credits (2+2P)**

Covers the skills necessary to touch type on the computer keyboard using correct techniques. This includes the development of speed, accuracy, and formatting of basic business documents. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Learning Outcomes

1. Demonstrate the correct operation of the alphabetic, numeric, symbol keys, space bar, shift keys, and return (enter) keys.
2. Have a thorough knowledge of correct hand position and posture for accurate keyboarding.
3. Keyboard words, sentences, and paragraphs smoothly, quickly, and accurately using the touch typing method.
4. Have the ability to keyboard with speed and accuracy.
5. Perform keyboarding and basic formatting functions to create professional business documents.

**OATS 102. Keyboarding: Document Formatting
3 Credits (2+2P)**

Designed to improve keyboarding speed and accuracy; introduce formats of letters, tables and reports. A speed and accuracy competency requirement must be met.

Prerequisite: OATS 101 or consent of instructor.

OATS 105. Business English**3 Credits (3)**

Training and application of the fundamentals of basic grammar, capitalization, punctuation, basic writing, sentence structure, and editing skills. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Learning Outcomes

1. Identify and apply the rules for each of the parts of speech.
2. Construct four basic sentence patterns.
3. Apply punctuation, capitalization and numbers style to writing proficiently.
4. Utilize proofreader's marks in the editing of business correspondence.
5. Make use of appropriate reference materials to locate answers to language questions.

OATS 106. Business Mathematics**3 Credits (2+2P)**

Mathematical applications for business. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Prerequisite(s): CCDM 103 N or adequate score on math placement exam.

Learning Outcomes

1. Apply fundamental concepts to personal and business math operations.
2. Maintain a checkbook.
3. Solve percent and percentage applications.
4. Calculate discounts, markups, and markdowns.
5. Calculate wages, salaries, deductions, and net pay.
6. Compare various borrowing options and identify the most cost effective option.
7. Interpret consumer loans and credit card accounts.
8. Compare various home ownership options.
9. Calculate taxes and identify insurance options.

OATS 110. Records Management**3 Credits (3)**

Principles, methods and procedures for the selection, operation and control of manual and automated records systems.

OATS 120. Accounting Procedures I**3 Credits (2+2P)**

Business accounting principles and procedures. Use of special journals, cash control, and merchandising concepts. Reports for sole proprietorships.

OATS 121. Accounting Procedures II**3 Credits (2+2P)**

Continuation of OATS 120, emphasizing accounting principles and procedures for notes and interest, depreciation, partnerships and corporations, cash flow and financial statement analysis. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): OATS 120 or ACCT 2110.

OATS 140. Payroll Accounting**3 Credits (2+2P)**

Payroll procedures including payroll tax forms and deposits. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): ACCT 2110 or OATS 120.

OATS 150. Medical Terminology**3 Credits (3)**

Understanding of the basic elements of medical words. Use of medical abbreviations. Same as NURS 150 and OEHO 120. May be repeated up to 3 credits. Crosslisted with: NURS 150, AHS 120 and HIT 150. Restricted to Community Colleges campuses only.

OATS 169. Spanish Grammar for Business Administration**3 Credits (3)**

Introductory course in Spanish grammar and practical business terms required for the proper application of fundamental oral and written business communication skills for Spanish speakers in the field of business administration. Restricted to Community Colleges campuses only.

Prerequisite(s): Spanish-speaking ability and computer keyboarding ability.

OATS 170. Office Communications in Spanish I**3 Credits (3)**

Develop oral and written communications skills of native or near-native speakers of Spanish. The student will learn basic letter writing skills, customer service techniques, and telephone etiquette in Spanish. Spanish speaking ability is required to enroll in this course. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses

OATS 171. Office Communications in Spanish II**3 Credits (3)**

Develop oral and written communications skills of native or near-native speakers of Spanish. Emphasis placed on learning the office assistant's role within the office environment. Compose complex business correspondence and learn to make international travel arrangements. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses

Prerequisite(s): OATS 170, Spanish speaking ability.

OATS 191. Taking Minutes & Proofreading**3 Credits (3)**

Preparation and practice producing minutes suited for different meeting types and purposes. Provides strategies to prepare for meetings, to record proceedings, and to transcribe minutes while incorporating proofreading skills practice. Topics include legal requirements, meeting types, minute formats, and duties/expectations of the minute taker and the meeting chair. Graded: S/U. May be repeated up to 3 credits. Restricted to Community Colleges campuses

OATS 202. Keyboarding Document Production**3 Credits (2+2P)**

Further development of keyboarding speed and accuracy. Production of complex letters, memos, tables, reports and business forms. A speed and accuracy competency requirement must be met. Restricted to Community Colleges campuses

OATS 203. Office Equipment and Procedures I**3 Credits (2+2P)**

Office organization, telephone techniques, equipment and supplies, handling meetings, human relations, mail procedures, and travel. May be repeated up to 3 credits. Restricted to Community Colleges campuses

OATS 205. Accounting Software I**3 Credits (2+2P)**

Introduction to accounting software. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): Working knowledge of computers and accounting or consent of instructor.

OATS 207. Machine Transcription**3 Credits (2+2P)**

Creating office documents using transcribing equipment and word processing software. Emphasis on proofreading, editing and grammar. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Prerequisite(s): BOT 105.

OATS 208. Medical Office Procedures**3 Credits (2+2P)**

Current computerized and traditional administrative medical office procedures will be introduced. Practical knowledge on managing required record keeping in a medical office environment will be emphasized. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Prerequisite(s): HIT 150 or AHS 120, and computer keyboarding ability or consent of instructor.

OATS 209. Business and Technical Communications**3 Credits (3)**

Effective written communication skills and techniques for career success in the work place. Composition of letters, memos, short reports, forms, and proposals, and technical descriptions and directions.

Prerequisites: ENGL 1110G and computer keyboarding ability or consent of instructor.

OATS 211. Information Processing I**3 Credits (2+2P)**

Defining and applying fundamental information processing concepts and techniques using the current version of leading software. May be repeated up to 6 credits. Restricted to Community Colleges campuses

OATS 213. Word Processing I**3 Credits (2+2P)**

Operation and function of a word processor. Specific equipment to be announced in the Schedule of Classes.

Prerequisite: OATS 101 or keyboarding proficiency.

OATS 214. Word Processing II**3 Credits (2+2P)**

Advanced operation and functions of a word processor. Specific equipment to be announced in the Schedule of Classes.

Prerequisite: OATS 213 or consent of instructor.

OATS 215. Spreadsheet Applications**1-3 Credits**

Use of spreadsheets to include graphics and business applications. Same as OECS 215. May be repeated under different subtitles listed in the Schedule of Classes.

OATS 217. Powerpoint Presentation**3 Credits (3)**

Comprehensive, hands-on approach to learning and applying basic and advanced features of PowerPoint. These include text enhancements, objects, fills, colors, animation, charts, sound, video, and hyperlinks. Students demonstrate appropriate audience and communication tools to deliver presentations.

Prerequisites: OATS 211 or ability to demonstrate keyboarding and Windows proficiency.

OATS 218. Information Processing II**3 Credits (2+2P)**

Advanced information processing techniques using current version of leading software. May be repeated for a maximum of 6 credits.

Prerequisite: OATS 211 or consent of instructor.

OATS 220. Internship in Business Office Technology**2 Credits (2)**

Experience in a supervised office position. Student must work at least eight hours per week. May be repeated for a maximum of 4 credits.

Prerequisites: sophomore standing and consent of instructor.

OATS 221. Internship I**1-3 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. C- or better in the course is required. Consent of Instructor required. Restricted to: BOT,HIT. majors. Restricted to Community Colleges campuses

OATS 222. Internship II**1-3 Credits**

Continuation of OATS 221. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: OATS & HIT majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

Prerequisite(s): OATS 221 and consent of instructor.

OATS 223. Medical Transcription I**3 Credits (2+2P)**

Concepts in medical transcription are introduced on how to produce a variety of reports required in a medical office or facility utilizing accurate medical terminology, spelling, grammar, and document formatting. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): HIT 150 or AHS 120 and HIT 158 and OATS 209.

OATS 228. Medical Insurance Billing**3 Credits (2+2P)**

Comprehensive overview of the insurance concepts and applications required for successfully and accurately completing and submitting insurance claims and reimbursement processes for various insurance carriers, both private and government, will be emphasized. May be repeated up to 3 credits. Restricted to Community Colleges campuses

Prerequisite(s): HIT 150 or AHS 120.

OATS 233. Advanced Medical Transcription**3 Credits (2+2P)**

Builds upon the concepts introduced in Medical Transcription I providing greater understanding of how to produce advanced reports dictated by physicians with increasing speed and accuracy. Emphasis will be on proofreading and editing of operative reports, patient history and physicals, office notes, labor and delivery reports, consultation reports, discharge summaries, and other medical reports. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Prerequisite(s): OATS 223 and HIT 130.

OATS 239. Personal Development**3 Credits (3)**

Development of a marketable, employable office systems person, to include interview, voice, manners, and apparel.

OATS 240. Introduction to Individual Taxation**3 Credits (3)**

Overview of Individual Federal Taxation; awareness of tax problems pitfalls and planning opportunities; focus on individual personal financial concerns and tax planning. One semester of accounting principles/procedures is recommended.

OATS 241. Auditing and Business Issues**3 Credits (3)**

Introduction to basic auditing concepts, the purpose for the auditing process, and requirements of persons assisting with the audit process. The course will also deal with issues of business law including contracts, sales, torts, strict liability, and business ethics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): OATS 120 or ACCT 2110.

OATS 244. Tax Preparation**3 Credits (3)**

Introduces basic federal and state tax codes for preparing individual income tax returns. Emphasis on use of tax software.

Prerequisite: keyboarding proficiency.

OATS 250. Electronic Office Systems**3 Credits (2+2P)**

Management of the electronic office. Office use of computers, printers, fax machines, copiers, and scanner concepts will be covered.

Prerequisite: OATS 211.

OATS 255. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes.

OATS 260. Bookkeeping Simulation Capstone**3 Credits (2+2P)**

Refines the professional and technical skills students have learned while completing the Bookkeeping Assistant Option curriculum by demonstrating how coursework ties together. Designed as a bookkeeping assistant capstone course.

Prerequisite(s): OATS 121 or ACCT 2110, OATS 140, OATS 205, and OATS 244, or consent of instructor.

OATS 270. Office Administration Technology Capstone**3 Credits (2+2P)**

Refines professional skills learned in the BOT program and ties all BOT coursework together. May be repeated up to 3 credits. Consent of Instructor required. Restricted to Community Colleges campuses

Prerequisite(s): OATS 102 or OATS 129; and OATS 120; and OAT S 209 or ENGL 2210G; and OATS 211 or OECS 211.

Learning Outcomes

1. Construct professional, error-free business documents that demonstrate appropriate formats and ideas in clear, concise, and correct written and spoken language.
2. Utilize effective administration skills to enhance the productive operation of the workplace.
3. Demonstrate professional behaviors and workplace ethics for the professional office environment.
4. Demonstrate proficiency in the use of productivity software in business applications

OATS 298. Independent Study**1-3 Credits (1-3)**

Individual studies directed by consenting faculty with prior approval of department head. sophomore standing with 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

OEBM-BIOMEDICAL TECHNOLOGY

OEBM 140. Applied Human Biology for Biomedical Technology**3 Credits (3)**

Essential human biology, anatomy, physiology and medical terminology for biomedical equipment technicians. Focus on the vocabulary necessary for effective communication in the hospital environment as part of the health care team. Restricted to: Community Colleges only.

OEBM 141. Medical Electronics and Safety in Healthcare**3 Credits (3)**

Introduction to the biomedical equipment technology field. Operation of common biomedical equipment to include pressure and temperature systems, infusion devices, patient monitors, and other physiologic and patient systems. Hospital safety and health regulations explained. Restricted to Community Colleges campuses only.

Prerequisite(s): OEBM 140.

OEBM 200. Biomedical Internship**1-4 Credits (3-12P)**

Practice working in industry as a biomedical electronics technologist. Students work on a variety of medical equipment and job tasks. An employer evaluation, student report, and a minimum of 100 work hours are required. May be repeated up to 8 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Prerequisite(s): OEBM 140 and OEBM 141.

OEBM 211. CBET Exam Preparation**1 Credit (1)**

An overview of the Certified Biomedical Equipment Technician exam. Topics include anatomy and physiology, electronics principles, safety issues, equipment operation, and equipment troubleshooting.

Prerequisite(s)/Corequisite(s): OEBM 241 AND OEBM 240. Restricted to Community Colleges campuses only.

OEBM 240. Medical Imaging Systems**3 Credits (3)**

The fundamentals of diagnostic radiography equipment will be explored. Principles of an x-ray system will be explained including the x-ray generation, image formation and film processing. Focus will be on both safety and quality. Restricted to Community Colleges campuses only.

Prerequisite(s): OEBM 140.

OEBM 241. Advanced Medical Electronics**3 Credits (3+1P)**

Advanced study in biomedical equipment to include cardiovascular, pulmonary, telemetry and other critical life support systems. Restricted to Community Colleges campuses only.

Prerequisite(s): OEBM 141.

OECS-COMPUTER TECHNOLOGY

OECS 101. Computer Basics**1 Credit (1)**

Hands-on instruction to introduce computer use and commonly used software. Graded S/U.

OECS 105. Introduction to Information Technology**3 Credits (3)**

Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communication, data analysis, information management and decision-making. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

OECS 110. Introduction to Power Point**1-3 Credits (1-3)**

An introduction to Power Point software to develop business presentations. Includes concepts of basic presentation methods and graphic design principles. Students will create and deliver presentations using text, charts, digitized images, and sound. Restricted to Community Colleges campuses only.

OECS 125. Operating Systems**1-3 Credits**

Installation, configuration and optimization of current operating systems. Restricted to: Community Colleges only.

OECS 128. Operating Systems Linux/Unix**3 Credits (3)**

Installation, configuration, and use of Linux/Unix operating system software and utilities including hardware management, file management, use of command line, and scripting. Restricted to: Community Colleges only.

OECS 145. Mobile Application Development**1-3 Credits (1-3)**

Introduction to elements of mobile application coding including concepts, design strategies, tools needed to create, test and deploy applications for mobile devices. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

OECS 155. Special Topics - Introductory Computer Technology**0.5-4 Credits (.5-4)**

Topics to be announced in the Schedule of Classes. May be repeated up to 8 credits.

OECS 185. PC Maintenance and Repair I**1-3 Credits**

Introduction to most common types of PC configurations, installations, and failures. This course will explore troubleshooting skills for maintaining and repairing common hardware and software related problems. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

OECS 192. C++ Programming I**3 Credits (3)**

Development of skills in programming using the C++ programming language. Restricted to: Community Colleges only.

OECS 195. Java Programming I**1-3 Credits**

Developing of skills in programming using the Java programming language. Restricted to: Community Colleges only.

OECS 200. Accounting on Microcomputers**3 Credits (3)**

Fundamental accounting principles using popular microcomputer software to include G/L, A/R, A/P, purchase order, billing, inventory, and forecasting modules.

Prerequisite: ACCT 2110 or OATS 121.

OECS 204. Linux Operating System**1-3 Credits**

Install and configure the Linux operating system on X86 systems. Covers issues involved in maintaining operating system, networking, creating and managing users, and installing and updating software. General procedures for working with operating system includes maintaining disk space, preserving system security, and other related topics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

OECS 207. Windows**0.5-3 Credits**

Covers local installation, configuration of core local services, managing users, and the general local management and maintenance of Windows workstations. May be repeated up to 6 credits.

Prerequisite(s)/Corequisite(s): OECS 185. Restricted to Community Colleges campuses only.

OECS 208. Internet Applications**1-3 Credits**

Survey of the Internet to include e-mail, file transfer, current search techniques, the World Wide Web and basic Web page development. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

OECS 209. Computer Graphic Arts**1-3 Credits**

Basic graphics composition using computer programs to include editing and manipulating graphic images, clip-art, and printing of pictures. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes.

Prerequisite: OECS 105, BCIS 1110, or OECS 101.

OECS 211. Word Processing Applications**1-3 Credits**

Basic word processing to include composing, editing, formatting, and printing of documents. May be repeated under different subtitles listed in the Schedule of Classes for a maximum of 6 credits.

Prerequisites: BCIS 1110 or OECS 105.

OECS 215. Spreadsheet Applications**1-3 Credits**

Use of spreadsheets to include graphics and business applications. May be repeated for a maximum of 6 credits.

Prerequisites: BCIS 1110 or OECS 105.

OECS 220. Database Application and Design**1-3 Credits**

Creating, sorting, and searching of single and multifile databases to include report generation and programming database commands. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes. Restricted to: Community Colleges only.

Prerequisite(s): BCIS 1110 OR E T 120 OR E T 122 OR OECS 105.

OECS 221. Internship I**1-3 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

Prerequisite(s): Consent of instructor.

OECS 222. Internship II**1-3 Credits**

Continuation of OECS 221. Each credit requires specified number of hours of on-the-job work experience. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

Prerequisite(s): OECS 221 and consent of instructor.

OECS 223. Web Design for Business**3 Credits (3)**

Design and create a website using HTML, CSS, web development tools and industry-recognized software while applying best practices in site management and business web presence.

Learning Outcomes

1. Students will identify and apply best practices for web design in a business setting.
2. Students will create a basic web page utilizing WC3 principles.
3. Students will explain the importance and impact of web presence in today's business environment.
4. Students will determine and utilize web page features and techniques for a specific business.
5. Students will create a web design management plan for business.
6. Students will discuss web page tools for performance and web traffic analytics.
7. Students will identify web design components for a motble society.

OECS 227. Computer Applications for Technicians**3 Credits (3)**

Computer applications for service technicians in various disciplines. Hardware and software applications explored. Includes operating systems, high level programming, and networking hardware and software.

OECS 230. Data Communications and Networks I**1-3 Credits**

Definition of data communication; survey of hardware applications and teleprocessor software; examination and design of networks. May be repeated for a maximum of 6 credits.

Prerequisite: OECS 185.

OECS 231. Data Communications and Networks II**1-3 Credits**

Installation and application of popular microcomputer network software. May be repeated for a maximum of 6 credits.

Prerequisite: OECS 230.

OECS 234. Linux Server**3-4 Credits (3-4)**

This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Linux Server(s). It provides in-depth, hands-on training for planning, implementation, management and support of Linux networking services. May be repeated up to 8 credits.

Prerequisite(s)/Corequisite(s): OECS 204. Restricted to: OECS majors. Restricted to Community Colleges campuses only.

OECS 235. Structured Query Language (SQL)**1-3 Credits**

Installation, configuration, administration, and troubleshooting of SQL client/server database management system. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): OECS 220. Restricted to Community Colleges campuses only.

OECS 237. Windows Server**3-4 Credits (3-4)**

This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Microsoft Windows Server Active Directory Domain Services in medium to large businesses. It provides in-depth, hands-on training for Information Technology (IT) professionals responsible for the planning, implementation, management, and support of Windows Active Directory services. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): OECS 207. Restricted to Community Colleges campuses only.

OECS 245. Game Programming I**3 Credits (3)**

Development of programming skills for games and animation using current programming languages and tools. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

OECS 246. Game Programming II**3 Credits (3)**

Continuation of OECS 245. May be repeated for a maximum of 6 credits.

Prerequisite: OECS 245.

OECS 253. Applied Data Analysis and Management**3 Credits (3)**

Applied use of advanced spreadsheet tools for data analysis and database tools for data and information management. Connect emerging topics in business to tools used in analyzing data and making raw data useful for business decision making.

Prerequisite: BCIS 1110.

Learning Outcomes

1. Manage, integrate, and analyze data with data tools.
2. Generate and summarize data.
3. Use tools for business projections, comparisons, trends, and informed decisions.
4. Create advanced queries and enhance table design.
5. Use form tools and create custom forms.
6. Use automation tools for efficiency.
7. Secure and maintain data.
8. Plan, research, create, and revise spreadsheets and databases for a specific business application.
9. Discuss emerging topics in business related to data analysis and mangement.

OECS 255. Special Topics**1-4 Credits**

Topics to be announced in the Schedule of Classes.

OECS 261. Introduction to Networks**3-4 Credits (3-4)**

Introduction to networking principles including the practical and conceptual skills for understanding basic networking, planning and designing networks, implementing IP addressing schemes, examining the OSI and TCP/IP layers, and performing basic configurations for routers and switches. Aligns to the first course of the Cisco Networking Academy CCNA curriculum. Restricted to Community Colleges campuses only.

OECS 262. Essentials of Routing and Switching**3-4 Credits (3-4)**

Examination of the architecture, components, and operations of routers and switches in a small network. Student will learn how to configure, verify and troubleshoot: routers and switches, static routing, default routing, VLANs, and ACLs. Aligns to the second course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): OECS 261. Restricted to Community Colleges campuses only.

OECS 263. Network Fundamentals**3-4 Credits (3-4)**

Fundamentals of networking architecture, components, and operations including practical and conceptual skills using routers and switches. Student will learn how to configure, verify and troubleshoot static routing, default routing, VLANs, and ACLs. This course aligns to the third course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): OECS 262. Restricted to Community Colleges campuses only.

OECS 264. Network Routing Protocols**3-4 Credits (3-4)**

Fundamentals of routing protocols for troubleshooting advanced network operations. Covers common networking issues such as RIP, OSPF, and EIGRP for IPv4 and IPv6 networks. This course aligns to the fourth course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): OECS 263. Restricted to Community Colleges campuses only.

OECS 269. Network Security**3-4 Credits (3-4)**

Fundamentals of design and implementation of network security solutions that will reduce the risk of system vulnerability. May be repeated up to 8 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): OECS 204 or OECS 207 or OECS 261 or consent of instructor.

OECS 275. PC Maintenance and Repair II**1-3 Credits**

Continuation of OECS 185. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): OECS 185.

OECS 280. Desktop Publishing I**3 Credits (3)**

Design and production of publication materials to fill the needs of business communities, using a microcomputer. May be repeated for a maximum of 6 credits. Same as OATS 280.

Prerequisites: either BCIS 1110, OECS 105.

OECS 290. Computer Technology Capstone**1-3 Credits**

Refines skills learned in the OECS program. Culminates in a review and practice of advanced software applications. May be repeated up to 3 credits. Restricted to: OECS & OECT majors. Restricted to Community Colleges campuses only.

Prerequisite(s): (OECS 125, OECS 128, OECS 207, OR OECS 203) AND (OECS 185 OR E T 283).

OECS 299. Independent Study**1-3 Credits**

Specific subjects to be determined based on need. Restricted to: Community Colleges only.

OEEM- PARAMEDIC

OEEM 101. CPR for the Health Care Professional**1 Credit (1)**

Students learn identification and response to airway and circulation emergencies, including use of a SAED and accessing the EMS system.

This course is taught using the American Heart Association guidelines for course completion. Required: grade of C or better.

OEEM 103. Heartsaver First Aid/CPR**1 Credit (1)**

Students learn how to identify and respond to airway, circulation and basic first aid emergencies, to include using a SAED and accessing the EMS system. This course is intended for students who are not Allied Health Majors and utilizes the American Heart Association guidelines for course completion. Restricted to: Community Colleges only.

OEEM 115. First Responder Prehospital Professional**3 Credits (2+3P)**

Provides training in prehospital medical and traumatic emergencies.

Consent of instructor required. Requires a C or better to pass. Restricted to majors.

Corequisite(s): OEEM 101.

OEEM 120. Emergency Medical Technician Basic**6 Credits (6)**

EMT-Basic skills to include care of soft tissue and muscular/skeletal injuries, circulatory, nervous, general medical and respiratory emergencies. Requires a "C" or better to pass. May be repeated up to 6 credits. Consent of Instructor required.

Corequisite(s): OEEM 101, OEEM 120L, OEEM 121.

Prerequisite(s)/Corequisite(s): OEEM 153. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

OEEM 120 L. Emergency Medical Technician Basic Lab**2 Credits (6P)**

EMT-Basic skills development with emphasis on assessment, skills competency and team-work in patient care in the prehospital setting. May be repeated up to 2 credits.

Corequisite(s): OEEM 101, OEEM 120, OEEM 121.

Prerequisite(s)/Corequisite(s): OEEM 153. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

OEEM 121. Emergency Medical Technician Basic Field/Clinical**1 Credit (3P)**

Covers the patient care experience provided through assigned shifts in the hospital and/or ambulance setting. Requires a "C" or better to pass. May be repeated up to 1 credits. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): OEEM 101, OEEM 120, OEEM 120L OEEM 153. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

**OEEM 150. Emergency Medical Technician Intermediate
5 Credits (5)**

Theory of the roles, responsibilities and scope of practice of the EMT-Intermediate. Assessment and management of respiratory, cardiac, trauma, environmental, behavior, reproduction, and childhood emergencies. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

Prerequisite(s): Current EMT-basic license, pretest and consent of instructor.

**OEEM 150 L. Emergency Medical Technician Intermediate Lab
2 Credits (6P)**

EMT-Intermediate skills development with an emphasis on assessment, skills competency, and team work in patient care in the prehospital setting. Requires a C or better to pass.

Prerequisite(s)/Corequisite(s): OEEM 150, OEEM 151. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

**OEEM 151. Emergency Medical Technician Intermediate Field/Clinical
2 Credits (6P)**

Patient care experience provided through assigned shifts in the hospital and/or ambulance setting.

Prerequisite(s)/Corequisite(s): OEEM 150, OEEM 150 L. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

**OEEM 153. Introduction to Anatomy and Physiology for the EMS Provider
3 Credits (3)**

To properly assess and manage a patient, a prehospital provider must have a solid foundation in human anatomy and physiology. This course provides a systematic approach to building this foundation. Grade of "C" or better is required to pass the course. Consent of Instructor required. Restricted to Community Colleges campuses only.

OEEM 155. Special Topics

1-6 Credits

Specific topics to be listed in Schedule of Classes. May be repeated for a maximum of 10 credits.

**OEEM 177. Emergency Medical Services Instructor
4 Credits (4)**

Theory of student learning, methodology, instructional components, evaluation, and course coordination for the EMS profession. May be repeated up to 4 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Prerequisite(s): Minimum of an EMT-Basic License required.

**OEEM 201. Human Systems, Pathophysiology and Development
3 Credits (3)**

A course which provides a survey of human anatomy and physiology, pathological processes, and life span development. Emphasis is placed on interrelationships among organ systems and deviation from homeostasis. Restricted to: OEEM majors. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.

Prerequisite: OEEM 120, OEEM 120 L.

Learning Outcomes

1. Explain the general terminology, anatomy, and physiology of the human body.
2. Apply principles of normal anatomy and physiology of the human body to the pathophysiologic processes of common health problems.
3. Associate pathophysiology to patient assessment and treatment.
4. Describe key physiologic and psychosocial changes that occur in different age groups.

**OEEM 202. Airway and Respiratory Emergencies
2 Credits (2)**

A course which focuses on the anatomy, physiology, and pathophysiology of the respiratory system. Integrates the knowledge to develop and implement a comprehensive treatment plan, with the goal of assuring a patent airway, adequate mechanical ventilation and respiration for patients of all ages. Requires a "C" or better to pass. Restricted to: OEEM majors. Restricted to Community Colleges campuses only. May be repeated up to 2 credits.

Prerequisite: OEEM 201, OEEM 206, OEEM 207.

Corequisite: OEEM 202 L.

Learning Outcomes

1. Demonstrates an understanding of the mechanics, neurological control and diseases impacting respiration and ventilation.
2. Demonstrates an understanding of various methods, tools and techniques to assure a patent airway, ventilation and respiration.
3. Integrate assessment findings with emergency pharmacology and relevant tools to create and implement treatment plans for patients with medical or trauma related respiratory complaints.

**OEEM 202 L. Airway and Respiratory Emergencies
1 Credit (3P)**

A course which focuses on the anatomy, physiology, and pathophysiology of the respiratory system. Integrates the knowledge to develop and implement a comprehensive treatment plan, with the goal of assuring a patent airway, adequate mechanical ventilation and respiration for patients of all ages. Requires a "C" or better to pass. Restricted to: OEEM majors. Restricted to Community Colleges campuses only. May be repeated up to 2 credits.

Prerequisite: OEEM 201, OEEM 206, OEEM 207.

Corequisite: OEEM 202.

Learning Outcomes

1. Appropriately utilizes various methods, tools and techniques to assure a patent airway, ventilation and respiration.
2. Integrates assessment findings with emergency pharmacology and relevant tools to implement treatment plans for patients with medical or trauma related respiratory complaints.
3. Act as an entry-level Paramedic team leader in an airway management, ventilation or respiratory simulation.

OEEM 203. Paramedic Trauma Care**2 Credits (2)**

A course which covers the mechanism of injury, pathophysiology, diagnosis, assessment, treatment and care of the trauma and environmental emergency patient. Consent of instructor. Restricted to majors. Requires a C or better to pass. Restricted to: OEEM majors. Restricted to Community Colleges campuses only. May be repeated up to 2 credits.

Prerequisite: OEEM 201, OEEM 206, OEEM 207.

Corequisite: OEEM 203 L.

Learning Outcomes

1. Understands epidemiology, trauma scoring and destination decisions.
2. Formulates comprehensive and focused assessment strategies for minor, moderate and critically ill patients with bleeding; chest, abdominal, genitourinary, orthopedic, soft tissue, head, face, neck, spine, nervous system trauma.
3. Construct assessment and treatment plans for vulnerable trauma patient populations including the cognitively impaired, pregnant, pediatrics and geriatrics.
4. Understands the pathophysiology, assessment, management and treatment of environmental emergencies.
5. Understands the pathophysiology, assessment, management and treatment of the multisystem trauma patient.

OEEM 203 L. Paramedic Trauma Care Lab**1 Credit (3P)**

A practical course which covers the mechanism of injury, pathophysiology, diagnosis, assessment, treatment and care of the trauma and environmental patient. Consent of instructor. Restricted to majors. Requires a C or better to pass. Restricted to: OEEM majors. Restricted to Community Colleges campuses only. May be repeated up to 1 credit.

Prerequisite: OEEM 201, OEEM 206, OEEM 207.

Corequisite: OEEM 203.

Learning Outcomes

1. Applies an understanding of epidemiology, trauma scoring and destination decisions.
2. Implements comprehensive and focused assessment strategies for minor, moderate and critically ill patients with bleeding; chest, abdominal, genitourinary, orthopedic, soft tissue, head, face, neck, spine, nervous system trauma.
3. Constructs and applies assessment and treatment plans for vulnerable trauma patient populations including the cognitively impaired, pregnant, pediatrics and geriatrics.
4. Applies an understanding of the pathophysiology, assessment, management and treatment of environmental emergencies.
5. Applies an understanding of the pathophysiology, assessment, management and treatment of the multisystem trauma patient.

OEEM 206. Introduction Paramedic Practice**3 Credits (3)**

A course which introduces students to the advanced practice of prehospital medicine, research, medical legal issues, the wellbeing of the provider. Reviews foundational EMS knowledge and the NM Paramedic Scope of Practice. Emphasizes paramedic operations within the healthcare system. Requires a C or better to pass. Restricted to majors. Consent of instructor required. Restricted to: Community Colleges only. Restricted to OEEM majors. May be repeated up to 3 credits.

Prerequisite: OEEM 120, OEEM 120 L, OEEM 121.

Learning Outcomes

1. Discuss paramedic roles and responsibilities within an EMS system.
2. Analyze and interpret research and describe how to integrate findings into evidence
3. Integrates health and safety principles to maintain provider, crew and situational awareness, safety, and wellbeing.
4. Uses appropriate written or electronic tools to effectively document the essential elements of patient care and transport.
5. Explains the components of the EMS communications systems and the importance of Quality Assurance/Quality Improvement.
6. Applies the appropriate techniques of therapeutic communication with patients, families and other healthcare team members.
7. Identifies relevant laws and ethical issues which impact decisions made in healthcare settings.

OEEM 207. Emergency Pharmacology**2 Credits (2)**

A course which integrates comprehensive knowledge of pharmacology to formulate a treatment plan intended to mitigate emergencies and improve the overall health of the patient. Discusses physiologic actions, pharmacodynamics, pharmacokinetics, therapeutic effects, medication administration, dosages and interactions. Restricted to majors. Requires a C or better to pass. Restricted to: Community Colleges only. Restricted to OEEM majors. May be repeated up to 2 credits.

Prerequisite: OEEM 120 OEEM 120 L, OEEM 121.

Corequisite: OEEM 207 L.

Learning Outcomes

1. Explains relevant terms, processes and definitions relating to pharmacology.
2. Describes safety, storage and security, legislation, naming, classification and scheduling of medications.
3. Demonstrates appropriate decision making regarding medication administration to mitigate emergencies and improve overall health of the patient.
4. Demonstrates an understanding of the dosages, routes, indications, contraindications, mechanism of actions, side effects of medications in the National and NM Paramedic Scope of Practice.
5. Demonstrates application of ethical, legal, communication and documentation aspects of emergency pharmacology.

OEEM 207 L. Emergency Pharmacology Lab**1 Credit (3P)**

A course which integrates comprehensive knowledge of pharmacology to formulate a treatment plan intended to mitigate emergencies and improve the overall health of the patient. Students will practice medication administration, calculate medication dosages, vascular access, fluid administration and other related skills. Requires a C or better to pass. Instructor permission required. Restricted to: Community Colleges only. Restricted to OEEM majors. May be repeated up to 1 credit.

Prerequisite: OEEM 120, OEEM 120 L, OEEM 121.

Corequisite: OEEM 207.

Learning Outcomes

1. Demonstrates an ability to safely administer medications in the national and NM Paramedic Scope of Practice.
2. Calculates the correct volume, flow rate and amount of medication to be administered in a given situation.
3. Demonstrates an ability to administer medications as appropriate based on patient presentations.

OEEM 210. Cardiac Rhythm Interpretation**3 Credits (2+3P)**

Cardiac conduction system: electrophysiology, electrocardiogram, monitor, atrial, sinus, ventricular and junctional dysrhythmias, multiple lead EKG and 12 lead EKG interpretation. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEM, OEMS majors. Restricted to Community Colleges campuses only.

Prerequisite(s): OEEM 201, OEEM 206, OEEM 207.

OEEM 212. EMT-Paramedic Cardiovascular Emergencies**3 Credits (2+3P)**

Review anatomy, physiology, and pathophysiology of cardiovascular system. Assessment and management of cardiovascular emergencies in the prehospital setting. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

Prerequisite(s): OEEM 210.

OEEM 213. EMT-Paramedic: Medical Emergencies I**3 Credits (2+3P)**

Study of the disease process; assessment and management of neurological, endocrine, gastrointestinal, renal emergencies and infectious disease. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEEM, OEMS majors. Restricted to Community Colleges campuses only.

Prerequisite(s): OEEM 212.

OEEM 214. EMT-Paramedic: Medical Environmental Emergencies II**3 Credits (2+3P)**

Study of disease process, assessment, and management of poisoning, drug and alcohol abuse, environmental, behavioral and geriatric emergencies. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

Prerequisite(s): OEEM 213.

OEEM 216. EMT-Paramedic: Reproductive and Childhood Emergencies
3 Credits (2+3P)

Covers anatomy, physiology, disease processes, assessment and management of male and female reproductive system emergencies, childhood emergencies and growth and development. Restricted to majors. Requires a C or better to pass. Restricted to: Community Colleges only.

Prerequisite(s): OEEM 214 and consent of instructor.

OEEM 218. Pediatric Advance Life Support for the Healthcare Professional**1 Credit (1)**

Identify and respond to life threatening pediatric emergencies. Taught using the American Heart Association guidelines for course completion. Graded S/U.

Prerequisite: OEEM 101.

OEEM 219. Advance Cardiac Life Support for the Healthcare Provider
1 Credit (1)

Identify and respond to life threatening cardiac emergencies. Taught using the American Heart Association guidelines for course completion. Graded S/U.

Prerequisite: OEEM 101.

OEEM 230. EMT-Paramedic Clinical Experience I
3 Credits (9P)

Assigned clinical experiences in patient assessment and specific management techniques. Successful completion includes minimum required hours and completion of course objectives. Restricted to majors. Requires a C or better to pass.

Prerequisite: consent of instructor.

OEEM 231. EMT-Paramedic Clinical Experience II
3 Credits (9P)

Assigned clinical experiences in patient assessment and specific management techniques. Successful completion includes minimum required hours and completion of course objectives. Requires a "C" or better to pass. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): OEEM 230. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

OEEM 240. EMT-Paramedic Field Experience I
3 Credits (9P)

Advanced prehospital skills and knowledge. Successful completion of at least the minimum required hours and course objectives. Restricted to majors. Requires a C or better to pass.

Prerequisite: consent of instructor.

OEEM 241. EMT-Paramedic Field Experience II
3 Credits (9P)

Continued focus on advanced prehospital skills and knowledge, with increasing responsibility for patient care. Successful completion includes meeting at least the minimum required hours and course objectives.

Prerequisite(s)/Corequisite(s): OEEM 240. Requires a C- or better to pass.

OEEM 242. EMT-Paramedic Field Internship
3 Credits (9P)

Emphasis on total patient care responsibility and team leadership skills. Successful completion includes meeting the minimum hours required and course objectives. Pre/ Consent of Instructor required. Restricted to: OEEM majors. Restricted to Community Colleges campuses only.

Prerequisite(s): OEEM 231, OEEM 241.

OEEM 243. EMT-Paramedic Preparation for Practice
2 Credits (2)

Comprehensive final program testing to prepare for licensing examination. Requires a "C" or better to pass. May be repeated up to 2 credits. Consent of Instructor required. Restricted to: OEMS, OEEM majors. Restricted to Community Colleges campuses only.

Prerequisite(s): OEEM 242.

OEET- ELECTRICAL TRADES

OEET 110. Basic Electricity and Electronics

4 Credits (3+3P)

An introduction to electricity theory and practice, including electron theory, Ohm's law, construction of electrical circuits, direct and alternating currents, magnetism, transformers, and practical applications. Same as HVAC 102, ELT 105, OEPB 102.

OEET 120. Basic Motor Controls

5 Credits (2+6P)

Developing schematics and wiring simple manual and electromechanical control devices.

Prerequisite: OEET 110 or consent of instructor.

OEET 151. Electrical Apprenticeship I

6 Credits (6)

Apprenticeship responsibilities and benefits as well as first aid and CPR will be covered. Hand tools, electrical theory, and the regulations imposed by national codes and OSHA. Students will apply theory taught in their jobs.

Prerequisite: consent of instructor.

OEET 152. Electrical Apprenticeship II

6 Credits (6)

OHM's law circuit sizing and service panel sizing will be covered in detail. Other topics include low voltage systems, heating and air conditioning circuits, alarm systems and smoke detectors.

Prerequisites: OEET 151 and consent of instructor.

OEET 153. Electrical Apprenticeship III

6 Credits (6)

Various electrical measuring devices will be covered in detail. Inductance, transformers, capacitance, and simple motors will be studied.

Prerequisites: OEET 152 and consent of instructor.

OEET 154. Electrical Apprenticeship IV

6 Credits (6)

Theory and application of three-phase transformers and autotransformers. Electrical distribution using switchboards, panelboards, and circuit breakers.

Prerequisites: OEET 153 and consent of instructor.

OEET 205. National Electric Code

3 Credits (3)

Interpretation and application of the National Electric Code.

Prerequisite: OEET 110.

OEET 251. Electrical Apprenticeship V

6 Credits (6)

Commercial/industrial applications for electricians. Blueprint interpretation, commercial construction types and processes, wiring methods, wiring materials, and motor controls.

Prerequisites: OEET 154 and consent of instructor.

OEET 252. Electrical Apprenticeship VI

6 Credits (6)

In-depth commercial applications to include commercial/industrial service calculations, mobile home parks, multi-family dwellings, and commercial fire/security systems.

Prerequisites: OEET 251 and consent of instructor.

OEET 253. Electrical Apprenticeship VII

6 Credits (6)

Control devices in commercial/industrial applications; emphasis on logic in-line diagrams, time delay starters, reversing starters, and manual/magnetic solenoids.

Prerequisites: OEET 252 and consent of instructor.

OEET 254. Electrical Apprenticeship VIII

6 Credits (6)

Miscellaneous topics for the journeyman electrician to include power distribution/transmission, solid state controls and relays, photoelectric and proximity controls and programmable controllers.

Prerequisites: OEET 253 and consent of instructor.

OEET 295. Special Topics

1-6 Credits

Topics to be announced in the Schedule of Classes.

OEGR-DIGITAL GRAPHIC TECH

OEGR 221. Cooperative Experience I

1-3 Credits

Student employed in approved work site; supervised and rated by employer and instructor. Each credit requires specified number of hours of on-the-job work experience. Restricted to majors. Graded S/U.

Prerequisite: consent of instructor.

OEES-GEOGRAPHIC INFO SYS

OEES 291. Special Topics in Geographic Information Systems

1-3 Credits (1-3)

Topics to be announced in the Schedule of Classes. May be repeated up to 12 credits. Restricted to Community Colleges campuses only.

OETS-TECHNICAL STUDIES

OETS 100. Industrial/Construction Safety

2 Credits (2)

Covers safety issues such as PPE, BBP, ladder safety, RTK, HazCom, MSDS and information about safety organizations such as OSHA, NIOSH, NFPA, National Safety Council. Community Colleges only. Restricted to Dona Ana and Carlsbad campuses.

OETS 102. Career Readiness Certification Preparation

1 Credit (1)

This course is designed to prepare students to successfully obtain Career Readiness Certifications in all areas and at the appropriate levels for their program of study. Graded: S/U Grading (S/U, Audit). May be repeated up to 3 credits. S/U Grading (S/U, Audit).

OETS 103. Technical Career Skills

4 Credits (4)

This course will be project-based and will encompass writing, presentation, math, reading, and critical thinking skills applied in a technical environment. Restricted to: Community Colleges only.

OETS 104. Basic Mathematics for Technicians

4 Credits (4)

Fundamental mathematical concepts and computations including measurement, ratio and proportions, and pre-algebra as it relates to technical programs.

Prerequisite: appropriate placement test score.

OETS 117. Writing for Technicians**3 Credits (3)**

Instruction in the skills for developing clear, written descriptions of processes and procedures used by technicians in various fields. Emphasis on correct grammar, logical organization, and receiving audience. Focuses on clarity, structure, and concise writing methods. Does not substitute for ENGL 111G. Restricted to: Community Colleges only.

OETS 118. Mathematics for Technicians**3 Credits (2+2P)**

Analysis and problem solving of technical problems using measuring instruments and techniques of arithmetic, algebra, geometry, and trigonometry. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): Grade of "C-" or better in OETS 104 or CCDM 103 N, or appropriate placement test score.

OETS 120. Business Fundamentals**3 Credits (3)**

Instruction in the skills for basic business concepts used by technicians in various fields. Emphasis placed on basic business concepts; business ownership including marketing, management, accounting, and customer services; interpersonal communication; and basic computer concepts including word processing, spreadsheets, and presentation software. Restricted to Community Colleges campuses only.

OETS 255. Special Topics Technical Studies**1-6 Credits**

Topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

Prerequisite(s): Consent of instructor.

PHED-PHYSICAL EDUCATION

PHED 1110. Dance:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1230. Individual Sport:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1290. Team Sport:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1310. Swim I:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1320. Aqua Fit:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1410. Yoga:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1430. Pilates:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1510. Training:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1620. Fitness:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1630. Career Fitness:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 10 credits.

Learning Outcomes

1. Varies

PHED 1670. Aerobics:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1830. Running:**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

PHED 1910. Outdoor Experience**1 Credit (1)**

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 2996. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. Each offering will carry appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHIL-PHILOSOPHY

PHIL 1115G. Introduction to Philosophy**3 Credits (3)**

In this course, students will be introduced to some of the key questions of philosophy through the study of classical and contemporary thinkers. Some of the questions students might consider are: Do we have free will? What is knowledge? What is the mind? What are our moral obligations to others? Students will engage with and learn to critically assess various philosophical approaches to such questions.

Learning Outcomes

1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.

PHIL 1120G. Logic, Reasoning, & Critical Thinking**3 Credits (3)**

The purpose of this course is to teach students how to analyze, critique, and construct arguments. The course includes an introductory survey of important logical concepts and tools needed for argument analysis. These concepts and tools will be used to examine select philosophical and scholarly texts.

Learning Outcomes

1. Comprehend components of arguments.
2. Acquire a general understanding of the essential logical concepts needed for argument analysis, such as validity, soundness, deduction, and induction.
3. Critically assess arguments with an aim toward identifying what constitutes effective and reasonable argument strategies.
4. Learn to identify common logical fallacies.
5. Apply knowledge of argumentation principles to philosophical and scholarly texts

PHIL 1140G. Philosophy and World Religions**3 Credits (3)**

A philosophical enquiry into the religious life; an introduction to philosophical questions about religions focused on consideration of some of the traditional approaches to God and what it means to be religious. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and describe philosophical theories regarding religion.
2. Develop and enhance your critical thinking skills, particularly in the evaluation of arguments about the truth or applicability of particular religious or secular viewpoints.
3. Analyze the teachings of world religions by describing their similarities and differences.
4. Explain the philosophical beliefs, practices, and ethical standards of the major world religions as well as emerging religious movements.
5. Explain how each religion evolved historically, philosophically, and spiritually as well as the contemporary ideas and practices each religion.

PHIL 1145G. Philosophy, Law, and Ethics**3 Credits (3)**

An introduction to practical problems in moral, social, political, and legal philosophy. Topics to be discussed may include ecology, animal rights, pornography, hate speech on campus, same-sex marriage, justice, abortion, terrorism, treatment of illegal immigrants, and New Mexican Aboriginal Peoples' land claims.

Learning Outcomes

1. The aim of this course is to familiarize students with some of the ethical and philosophical issues that arise in connection with laws/legality in general and criminal and constitutional law in the U.S. in particular.
2. It examines issues in moral philosophy, political philosophy, and philosophy of law.
3. A question to which we repeatedly return is whether the law does and/or ought to have some necessary relation to the demands of justice and morality. Among the topics we'll cover are: What is a law? Natural law vs. positive law and legal positivism vs. natural law theory; Utilitarian, divine command, Kantian, and natural law theories of moral rightness/wrongness; The distinction between the normative and the non-normative; Is there a moral duty to obey the law? Plato's Crito and R.P. Wolff's "philosophical anarchism."; J.S. Mill and classical liberalism; Mill's "harm principle" ("the state should restrict the liberty of competent adults via the criminal law only to prevent them from wrongfully harming other persons"); Legal paternalism. Should the state make it harder for citizens to smoke tobacco and/or marijuana, for their own good?; Should voluntary euthanasia be legal? Is there a constitutional "right to die"?; How should judges determine the meaning of vaguely worded constitutional requirements (e.g. "free exercise of religion," no "unreasonable search and seizure," no "cruel and unusual punishment," etc.)? Originalist vs. nonoriginalist approaches; The First Amendment, free speech, and freedom of religion; The death penalty and "cruel and unusual punishment"; The insanity defense in criminal law; Does the 14th Amendment's requirement of "equal protection" under the law compel states to recognize same sex marriage?; The Fourth Amendment and its prohibition of "unreasonable search and seizure."

PHIL 2110G. Introduction to Ethics**3 Credits (3)**

This course introduces students to the philosophical study of morality and will explore questions concerning our human obligations to others and related issues. Students may be asked to relate various approaches to ethics to present-day ethical debates and their own lives.

Learning Outcomes

1. Differential between various ethical theories, which may include virtue ethics, deontology, and consequentialism.
2. Critically evaluate various ethical theories and positions.

PHIL 2230G. Philosophical Thought**3 Credits (3)**

In this course, students will grapple with some of the key questions of philosophy through the study of classical and contemporary thinkers. Students will become familiar with the perennial problems in subfields of philosophy such as metaphysics, epistemology, ethics, and aesthetics. They will learn to approach these problems both critically and sympathetically.

Learning Outcomes

1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.
3. Identify the differences that characterize the major subfields of philosophy.

PHIL 305. Philosophy and Literature**3 Credits (3)**

Examination of philosophical ideas as presented in selected literary works and literary criticism.

PHIL 306. Philosophy Through Film**3 Credits (3)**

An exploration of a range of philosophical issues through the use of film. Topics include personal identity and memory, faith and the problem of evil, free will and moral responsibility, and the meaning of life. Films may include *The Prestige*, *Memento*, *The Third Man*, *A Clockwork Orange*, *Fight Club*, and *Synecdoche, New York*.

PHIL 312. Formal Logic**3 Credits (3)**

Introduction to symbolic logic and its application in the analysis of arguments in scientific and ordinary discourse.

PHIL 315. Philosophy of Language**3 Credits (3)**

A critical examination of philosophical inquiries into the syntactic, semantic, and pragmatic dimensions of language.

PHIL 316. Philosophy of Mathematics**3 Credits (3)**

Survey of traditional philosophical problems and views concerning the nature of mathematics including such questions as: What is the nature of mathematical knowledge? What is mathematical truth? What is a number? What is proof? What is the relationship between logic and mathematics?

PHIL 320. Social and Political Philosophy**3 Credits (3)**

This course critically examines such fundamental concepts as liberty, equality and human rights.

PHIL 322. Environmental Ethics**3 Credits (3)**

Explores the ethical and topical issues raised by mining and grazing, air and water pollution, factory farming, global warming, and treatment of animals. It also studies some recent ecological movements such as ecofeminism, social ecology, and deep ecology.

PHIL 323V. Engineering Ethics**3 Credits (3)**

The moral legal responsibilities of engineers to clients, employers, the public, and the environment. Topics include criteria for judging when risk is acceptable, the duty to safeguard public health and welfare, conflicts of interest, and whistle-blowing.

Prerequisite: Junior standing or higher.

PHIL 328. Applied Ethics**3 Credits (3)**

Examines the implications of utilitarianism, Kantian ethics, natural law theory, and other moral theories for controversial moral issues such as the death penalty, euthanasia, abortion, genetic engineering, gay marriage, affirmative action, and pornography.

PHIL 331. Philosophy of Religion**3 Credits (3)**

The nature, fundamental concepts, and problems of religion. Emphasis on the significance of religion for creative and practical value.

PHIL 332. Ethics and Global Poverty**3 Credits (3)**

Philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

PHIL 341. Ancient Philosophy**3 Credits (3)**

Introduction to the philosophies of the pre-Socratics, Socrates, Plato, Aristotle, with brief discussion of the Epicureans and Stoics.

PHIL 344. Modern Philosophy**3 Credits (3)**

Foundations of contemporary thought: introduction to the philosophies of Descartes, Bacon, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and Hegel.

PHIL 346. Philosophy of Mind**3 Credits (3)**

Examination of some of the most influential accounts of the mind, focusing on such issues as the relation between the mind and the body, mental causation and consciousness.

PHIL 350. Epistemology**3 Credits (3)**

Introduction to epistemology. The philosophical critique of alleged ways of knowing. An examination of the nature of truth.

PHIL 351. Philosophy of Science**3 Credits (3)**

Philosophical examination of the methodology of science. The logical, metaphysical, epistemological, and ethical critique of science and its impact on human affairs.

PHIL 361. Special Topics**3 Credits (3)**

Specific subjects announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

PHIL 363. Independent Studies**1-3 Credits**

For students with some background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHIL 373. Ethical Theory**3 Credits (3)**

The critical examination of the justification of ethical theories with particular attention to the language of moral discourse.

PHIL 376. Philosophy of Law**3 Credits (3)**

Ethical, logical, and epistemological implications of law, together with an analysis of the rhetoric of legal practice.

PHIL 380. Metaphysics**3 Credits (3)**

Introduction to metaphysics: a treatment of such issues as the meaning of existence, the mind-body problem, the problem of universals, and free will versus determinism.

PHIL 385. Human Nature and the Good Life**3 Credits (3)**

An examination of some of the most historically and philosophically influential conceptions of human nature and corresponding accounts of the good life.

PHIL 397. Existentialism**3 Credits (3)**

The origins of existentialist thought in philosophy and literature, including the thought of Nietzsche, Kierkegaard, Dostoyevsky, Camus, and Sartre. The course covers topics in ethics and political philosophy, metaphysics, philosophical psychology, philosophy of religion, and other sub-disciplines of philosophy.

PHIL 435. Internship in Philosophy and Law**3 Credits (3)**

Supervised hands-on experience for Justice, Political Philosophy, and Law majors to gain professional expertise of the law working with lawyers or judges in law offices, court rooms, and other professional legal settings. Student must be in junior and above standing to enroll. May be repeated up to 6 credits.

Prerequisite: Completion of 12 Philosophy credits; 2.5 GPA.

Learning Outcomes

1. Demonstrate practical knowledge, analytical ability and critical thinking of professional legal work by becoming familiar with such legal tasks as: preparing pleadings; preparing discovery, responding to discovery; controlling and organizing documents, information; preparing trial notebooks; preparing motions; contacting and responding to clients, witnesses, courts.

PHIL 448. Writing Philosophy**3 Credits (3)**

A workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes.

Prerequisite(s): completed 18 hours of philosophy credit.

PHIL 463. Independent Studies**1-3 Credits**

For students with a strong background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHIL 505. Advanced Studies in Philosophy and Literature**3 Credits (3)**

Examination of philosophical issues (e.g. personal identity, free will, moral dilemmas, the meaning of life) as presented in selected literary works and literary criticism. Consent of Instructor required.

PHIL 532. Advance Studies in Ethics and Global Poverty**3 Credits (3)**

Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

PHLS-PUBLIC HEALTH SCIENCES

PHLS 1110G. Personal Health & Wellness**3 Credits (3)**

A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others. May be repeated up to 3 credits.

Learning Outcomes

1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 1110H. Personal Health and Wellness Honors**3 Credits (3)**

A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others. In addition students will complete an experiential learning component or project. May be repeated up to 3 credits.

Learning Outcomes

1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 2110. Foundations of Health Education**3 Credits (3)**

Role and responsibility of the health educator with emphasis on small group dynamics, oral and written communication skills, building community coalitions and introduction to grant writing. Taught with PHLS 375. Cannot receive credit for both PHLS 2110 and PHLS 375. May be repeated up to 3 credits.

Prerequisite: PHLS 1110G, or consent of instructor.

Learning Outcomes

1. Define health, three levels of prevention, health education and health promotion, and describe the major determinants of health.
2. Describe the 7 major areas of responsibility, major competencies and sub-competencies of a professional health educator and the CHES's possible roles in various community health settings.
3. Describe and examine the historical context and development of the profession of health education.
4. Identify and critique major processes and practices of health education programming.
5. Describe the steps involved in conducting needs assessments, program and intervention planning, implementation, and program evaluation.
6. Identify, examine and describe elected health behavior change theories and models and explore possible applications in health education practice.
7. Describe and discuss the process of community mobilization and building of a community coalition.
8. Identify health issues and describe effective methods/strategies in health education advocacy.
9. Describe and discuss the future trends and issues in the professional preparation and practice of professional health educators. 1
10. Demonstrate effective and appropriate oral and written communication skills for health education professionals.

PHLS 2120. Essentials of Public Health**3 Credits (3)**

The course will focus on principles and major areas of public health, including ecological and total personal concept of health care system, epidemiological approaches to disease prevention and control. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the sources of public health data, and how to interpret that information.
2. Access existing health related data.
3. Analyze health related data.
4. Identify populations for health education programs.
5. Incorporate data analysis and principles of community organization.
6. Interpret results from evaluation and research.
7. Infer implications from findings for future health-related activities.
8. Have a basic understanding of health topics faced by various populations.

PHLS 3110V. Human Sexuality**3 Credits (3)**

Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles. May be repeated up to 3 credits.

PHLS 3120V. Women's Health Issues**3 Credits (3)**

A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: GNDR 381V. May be repeated up to 3 credits.

PHLS 3130V. Global Environmental Health Issues**3 Credits (3)**

Introduction to global environmental health challenges in the 21st century with an emphasis on environmental problems as they affect public health and personal well-being. May be repeated up to 3 credits.

PHLS 3210. Foundations of Community Health Education**3 Credits (3)**

Role and responsibility of the health educator, with emphasis on small-group dynamics, oral and written communication skills, building community coalitions, and an introduction to grant writing. Equivalent to PHLS 2110 for prerequisite purposed. May be repeated up to 3 credits.

PHLS 3220. Foundations of Public Health**3 Credits (3)**

The course will focus on principles and major areas of public health, including ecological concepts of healthcare systems and epidemiological approaches to disease promotion and control. Equivalent to PHLS 2120 for prerequisites. May be repeated up to 3 credits.

PHLS 4130. Environmental Health**3 Credits (3)**

Introduction to environmental health designed to address public health issues. May be repeated up to 3 credits. Restricted to: PH,PHL majors.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4210. Methods of Community Health Education**3 Credits (3)**

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4310. Biometrics and Health Research**3 Credits (3)**

Critical analysis of community health research and related methodologies. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: (MATH 1350G) or MATH 2350G or A ST 311.

PHLS 4320. Epidemiology**3 Credits (3)**

Epidemiologic approaches to disease prevention and control. Factors influencing health status. Restricted to: PHL majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4410. Administration of Health Programs**3 Credits (3)**

Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. Restricted to: PHL majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220, PHLS 2120, or consent of instructor.

PHLS 4420. Health Program Planning**3 Credits (3)**

Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3210 or PHLS 2120 and PHLS 4430.

PHLS 4430. Theoretically-Based Interventions**3 Credits (3)**

Identifying and developing interventions to problematic health-related behaviors. Restricted to: Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120.

PHLS 4440. Health Program Evaluation and Research**3 Credits (3)**

Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice. May be repeated up to 3 credits.

Prerequisite: PHLS 4420.

PHLS 4510. Public Health Seminar in Community Health Education**1 Credit (1)**

Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. Restricted to: Public Health majors. May be repeated up to 1 credit.

Prerequisite: PHLS 4320, PHLS 4420, and PHLS 4430 or consent of instructor.

PHLS 4515. Problems in Health Education**3 Credits (3)**

Provides opportunity for synthesis of program planning, implementation, and evaluation methodologies in the preparation and delivery of health education topics. Some field trips will be required. Restricted to: PHL majors. May be repeated up to 3 credits.

Prerequisite: Either PHLS 3220, PHLS 2120, PHLS 4440, PHLS 4430, or consent of instructor.

PHLS 4610. Health Disparities: Determinants and Interventions**3 Credits (3)**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. May be repeated up to 3 credits.

PHLS 4620V. Cross-Cultural Aspects of Health**3 Credits (3)**

An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 4630. International Health Problems**3 Credits (3)**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with PHLS 5630. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120 or consent of instructor.

PHLS 4640. Rural Health Issues**3 Credits (3)**

Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. Taught with PHLS 5640. May be repeated up to 3 credits.

PHLS 4650. Coping with Loss and Grief: A Cross-Cultural Perspective**3 Credits (3)**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with PHLS 5650. May be repeated up to 3 credits.

PHLS 4660. U.S.-Mexico Border Health Issues**3 Credits (3)**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with PHLS 5660 May be repeated up to 3 credits.

PHLS 4670. American Indian Health**3 Credits (3)**

Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits.

PHLS 4710. Introduction to Gerontology**3 Credits (3)**

Social, psychological, and physiological aspects of aging, with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. Taught with PHLS 5710. May be repeated up to 3 credits.

PHLS 4720. Health Promotion for the Older Adult**3 Credits (3)**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Taught with PHLS 5720. May be repeated up to 3 credits.

PHLS 4730. Adulthood and Aging**3 Credits (3)**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. Taught with PHLS 5730. May be repeated up to 3 credits.

PHLS 4740. Aging and Public Policy**3 Credits (3)**

Exploration of public policies relating to elders, historical development, current status and trends in public policy for this age group. Impact of political behavior of elders on policy making and implementing processes. May be repeated up to 3 credits.

PHLS 4810. Infectious and Noninfectious Disease Prevention**3 Credits (3)**

History, etiology, and prevention of diseases affecting humans. Restricted to: Public Health majors. Taught with PHLS 5810. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120, PHLS 4320 and Consent of Instructor.

PHLS 4820. Health Informatics**3 Credits (3)**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. Taught with PHLS 5820. Restricted to: Restricted to Public Health majors. May be repeated up to 3 credits.

Prerequisite: PHLS 3220 or PHLS 2120 or consent of instructor.

PHLS 4996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 4997. Independent Study**1-6 Credits (1-6)**

Individual studies with prior approval of department head. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 4998. Community Health Education Field Experience**1-6 Credits (1-6)**

Senior-standing community health education majors will integrate and apply various concepts related to actual community health education practice. Experience aims to prepare students to integrate the competencies and responsibilities of community health education. Approximately 55 hours at field agency required per credit hour. Restricted to: Public Health majors. May be repeated up to 6 credits.

Prerequisite: PHLS 4210 or concurrent enrollment.

Learning Outcomes

1. Varies

PHLS 5110. Community and Psychosocial Aspects of Public Health**3 Credits (3)**

Social, behavioral, and educational aspects of disease prevention and health promotion programs. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5120. Biostatistical Applications in Public Health**3 Credits (3)**

Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5130. Epidemiological Approaches to Disease Control and Prevention**3 Credits (3)**

Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5140. Health Services System: Administration and Organization**3 Credits (3)**

This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health services organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances. May be repeated up to 3 credits.

Learning Outcomes

1. Identify the main components of the organization for health care delivery and health care system in the U.S.
2. Compare health care systems in the U.S. and other developed countries.
3. Discuss resources and the principles of resources management in health care delivery.
4. Apply essential management functions (planning, organizing, staffing, leading, and controlling) to health services organizations.
5. Apply leadership and motivation concepts to the management of health services organizations.
6. Apply the principles and models of decision-making, communication, and managing change to address organizational challenges.
7. Demonstrate the knowledge and skills inherent in interprofessional work
8. Discuss how systems thinking works for healthcare delivery systems.

PHLS 5150. Environmental Public Health Issues**3 Credits (3)**

Environmental health issues from a public health perspective. Restricted to MPH majors. May be repeated up to 3 credits.

PHLS 5160. Public Health Policy Analysis**3 Credits (3)**

This graduate-level course presents the key aspects of the policymaking process in the United States. The course introduces students to the steps necessary to formulate, implement, and modify healthcare policies. Economic, cultural, institutional, and social factors influencing policymaking will be explored. The evolution of federal health policy, including major healthcare reform efforts, will be presented. Students will be provided with the necessary tools to comprehend and explain policymaking. The class will primarily focus on federal-level health policymaking, but several examples of state-level policies will be discussed. May be repeated up to 3 credits.

Learning Outcomes

1. Define and describe key health policy concepts: health, health determinants, public policy, and health policy.
2. Appreciate the significance of the Patient Protection and Affordable Care Act (ACA) and other major healthcare reform efforts and laws.
3. Describe the Longest Conceptual Model of the Public Policymaking Process and its key components of policy formulation, implementation, and modification.
4. Articulate the roles played by legislators, interest groups, researchers, and citizens in shaping and influencing health policy.
5. Summarize the roles of the three levels of government in making health policy.
6. Identify major health policy issues currently facing U.S. healthcare.

PHLS 5210. Foundations & Techniques of Public Health Education**3 Credits (3)**

Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education. May be repeated up to 3 credits.

Learning Outcomes

1. Explain, demonstrate, and apply health communication, education, and promotion knowledge and skill competencies
2. Discuss the means by which structural biases, social inequities, and other social determinants of health undermine health and create challenges to achieving health equity at interpersonal, organizational, community, societal, cultural, and legal and policy levels
3. Explain and demonstrate ways in which health communication, education, and promotion techniques can be utilized to increase health equity and reduce health disparities
4. Utilize health behavior change theories to develop health communication, education and promotion materials, processes, and goals
5. Identify best practices and evidence-based strategies and programs for use in health communication, education, and promotion

PHLS 5220. Techniques of Health Communication/Education**3 Credits (3)**

Application of a wide range of communication and education theories/ methods, including program planning and evaluation, in public health programming. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5230. Community Organization in Public Health**3 Credits (3)**

Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5240. Health Program Planning**3 Credits (3)**

Covers process of successful public health education program planning and grant writing. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5250. Evaluative Approaches in Public Health**3 Credits (3)**

Survey and analyses of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5120.

PHLS 5260. Research and Resources in Community Health**3 Credits (3)**

Exploration of available public health research studies, data, results and implications. Restricted to MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5120.

PHLS 5310. Principles of Health Program Management**3 Credits (3)**

This course prepares the student to assume a supervisory role in the management of health and human services programs. The course will cover essential management functions such as leadership, organizational assessment, planning, decision-making, organizational structure, budgeting, marketing, and human resource management. May be repeated up to 3 credits.

PHLS 5320. Health Services Organization and Delivery**3 Credits (3)**

This course includes the framework of the United States healthcare system; organization and administration of health services; alternate ways of organizing and financing health systems; the roles of the government and free market on health care services; and the barriers to health services delivery. May be repeated up to 3 credits.

PHLS 5330. Public Health Finance and Budget Management**3 Credits (3)**

Introduces health care accounting and finance to non-financial students. Students are exposed to the financial structure of health care organizations and the environment within which they operate. Instruction also introduces the use of accounting and financial information in investor-owned and not-for-profit organizations in the health care industry. Topics include understanding the creation and interpretation of financial statements, financial accounting and reporting requirements, financial analysis, budgeting, and resource allocation. May be repeated up to 3 credits.

PHLS 5340. Public Health Law and Ethics**3 Credits (3)**

This course examines major legal and ethical concepts and their impact on public health policy and practice. The course examines governmental authority, at various jurisdictional levels, to improve public health. This course will focus on public health law in the United States. Restricted to: MPH majors. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

PHLS 5610. Health Disparities: Determinants and Interventions**3 Credits (3)**

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. Taught with: PHLS 4610. May be repeated up to 3 credits.

PHLS 5620. Cross-Cultural Aspects of Health**3 Credits (3)**

An examination of health practices from a variety of cultural perspectives; communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 5630. International Health Problems**3 Credits (3)**

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with: PHLS 4630. May be repeated up to 3 credits.

PHLS 5635. International Health Practicum**1-3 Credits (1-3)**

Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits.

PHLS 5640. Rural Health Issues**3 Credits (3)**

Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Taught with: PHLS 4640. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

PHLS 5650. Coping with Loss and Grief: A Cross-Cultural Perspective**3 Credits (3)**

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with: PHLS 4650.

PHLS 5660. U.S.-Mexico Border Health Issues**3 Credits (3)**

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with: PHLS 4660. May be repeated up to 3 credits.

PHLS 5670. American Indian Health**3 Credits (3)**

Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits.

PHLS 5710. Introduction to Gerontology**3 Credits (3)**

Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. May be repeated up to 3 credits.

PHLS 5720. Health Promotion for the Older Adult**3 Credits (3)**

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. May be repeated up to 3 credits.

PHLS 5730. Adulthood and Aging**3 Credits (3)**

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobiographies. May be repeated up to 3 credits.

PHLS 5810. Infectious and Noninfectious Disease Prevention**3 Credits (3)**

History, etiology, and prevention of diseases affecting humans. Consent of Instructor required. May be repeated up to 3 credits.

PHLS 5820. Health Informatics**3 Credits (3)**

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. May be repeated up to 3 credits.

PHLS 5830. Public Health Preparedness and Response**3 Credits (3)**

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits.

PHLS 5996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. Restricted to: MPH majors. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 5997. Independent Study**1-6 Credits (1-6)**

Individual studies with prior approval of department head. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHLS 5998. Field Experience**1-4 Credits (1-4)**

Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. Consent of department head required. Restricted to MPH majors. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

PHLS 5999. Master's Thesis**1-6 Credits (1-6)**

Minimum of 4 credits required but may be repeated for a maximum of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHYS-PHYSICS

PHYS 1111. Introductory Computational Physics**3 Credits (2+2P)**

Introduction to computational techniques for the solution of physics-related problems.

Prerequisite(s): a C- or better in MATH 1220G or MATH 1250G or MATH 1511G.

PHYS 1112. Introductory Physics for the Health Sciences**3 Credits (3)**

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

Prerequisite(s): MATH 1215 or Equivalent.

Learning Outcomes

1. The objective of the course is to familiarize the student with the concepts and methods used in the underlying physics associated with various Health Science disciplines.
2. The course will demonstrate how the basic principles of mechanics, thermodynamics, electricity, magnetism, electromagnetic waves and optics can be applied to solve particular problems in Health Sciences applications. Introduces the student to selected topics in modern physics including quantum physics, atomic and nuclear physics.

PHYS 1115G. Survey of Physics with Lab**4 Credits (3+3P)**

Overview of the concepts and basic phenomena of physics. This course provides a largely descriptive and qualitative treatment with a minimum use of elementary mathematics to solve problems. No previous knowledge of physics is assumed. Includes laboratory.

Learning Outcomes

1. Apply concepts of classical mechanics (such as velocity, acceleration, force, inertia, momentum, torque, work, energy) to simple static and dynamic systems.
2. Apply concepts of thermodynamics (such as heat, temperature, internal energy, entropy) to simple processes.
3. Apply concepts of electricity and magnetism (such as fields, potential, charge conservation, static and dynamic induction) to simple circuits, motors, and other simple contrivances.
4. Apply simple geometric and wave optics in simple situations.
5. Test ideas using modern laboratory equipment.
6. Estimate experimental uncertainties.
7. Use computers to analyze and report laboratory results.
8. Draw appropriate conclusions from quantitative scientific observations.
9. Accurately and clearly communicate the results of scientific experiments.

PHYS 1125G. Physics of Music**4 Credits (3+2P)**

Introduction for non-science majors to basic concepts, laws, and skills in physics, in the context of a study of sound, acoustics, and music.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply basic classical mechanics to static and dynamic fluids, including Archimedes' principle and Bernoulli's principle.
3. Apply the general properties of waves to simple models of musical instruments.
4. Demonstrate knowledge of basic operating principles of wind, string, and percussion instruments.
5. Demonstrate knowledge of how objectively measurable properties of sound waves correspond to the perceptions of pitch, loudness, and timbre.
6. Demonstrate understanding of the description of vibrations and waves in terms of Fourier's Theorem and normal modes.
7. Demonstrate understanding of vocalization in terms of physical principles such as resonance and fluid dynamics.
8. Demonstrate understanding of how the ear works.

PHYS 1230G. Algebra-Based Physics I**3 Credits (3)**

An algebra-based treatment of Newtonian mechanics. Topics include kinematics and dynamics in one and two dimensions, conservation of energy and momentum, rotational motion, equilibrium, and fluids.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of particles in one and two dimensions.
3. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of a rigid body in two dimensions.
4. Apply Newton's theory of gravitation to circular orbits and demonstrate understanding of how Kepler's laws of planetary motion provide the empirical foundation for Newton's theory.
5. Apply the mathematics of vectors to the principles of Newtonian mechanics.
6. Apply principles of Newtonian mechanics to the case of static and dynamic incompressible fluids, including Archimedes' and Bernoulli's principles.

PHYS 1230L. Algebra-Based Physics I Lab**1 Credit (1)**

A series of laboratory experiments associated with the material presented in PHYS 1230G.

Prerequisite(s)/Corequisite(s): PHYS 1230G.

Learning Outcomes

1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1240G. Algebra-Based Physics II**3 Credits (3)**

The second half of a two semester algebra-based introduction to Physics. This course covers electricity, magnetism and optics.

Prerequisite(s): a C- or better in PHYS 1230G or PHYS 2230G.

Learning Outcomes

1. Be able to state Coulomb's Law and Gauss's laws and apply them.
2. Apply the concepts of electric charge, electric field and electric potential to solve problems.
3. Analyze simple DC and AC circuits.
4. Apply the Lorentz force to solve problems.
5. Apply Faraday's law of induction (and Lenz's law) to solve problems.
6. Apply ray optics to practical lens systems such as microscopes and corrective lenses.
7. Apply the wave nature of light to the phenomena of reflection, refraction, and diffraction.

PHYS 1240L. Algebra-Based Physics II Lab**1 Credit (1)**

A series of laboratory experiments associated with the material presented in PHYS 1240

Prerequisite(s)/Corequisite(s): PHYS 1240G.

Learning Outcomes

1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1310G. Calculus -Based Physics I**3 Credits (3)**

A calculus level treatment of classical mechanics and waves, which is concerned with the physical motion concepts, forces, energy concepts, momentum, rotational motion, angular momentum, gravity, and static equilibrium.

Prerequisite: a C- or better in ENGR 190 or MATH 1511G or higher.

Learning Outcomes

1. Describe the relationships among position, velocity, and acceleration as functions of time.
2. Use the equations of kinematics to describe motion under constant acceleration.
3. Analyze linear motion using Newton's laws, force, and linear momentum.
4. Analyze rotational motion using torque and angular momentum.
5. Analyze motion using work and energy.

PHYS 1310L. Calculus -Based Physics I Lab**1 Credit (3P)**

A series of laboratory experiments associated with the material presented in Calculus-based Physics I. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-based Physics I.

Prerequisite(s)/Corequisite(s): PHYS 1310G.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment.

PHYS 1311. Problems in Calculus-Based Physics I**0.5-1 Credits (.5-1)**

This is a supplemental course for Calculus-based Physics I. May be repeated up to 1 credits.

Corequisite(s): PHYS 1310G.

PHYS 1320G. Calculus -Based Physics II**3 Credits (3)**

A calculus level treatment of classical electricity and magnetism. It is strongly recommended that this course is taken at the same time as Calculus-based Physics II laboratory.

Prerequisite: a C- or better in (PHYS 2110 or PHYS 1310G) and (ENGR 190 or MATH 1521G or higher).

Learning Outcomes

1. Apply the concepts of electric charge, electric field and electric potential to solve problems.
2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge.
3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current.
4. Describe the relationship between electric field and electric potential.
5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles.
6. Apply the integral forms of Maxwell's equations.
7. Calculate the energy of electromagnetic fields.
8. Analyze DC circuits.

PHYS 1320L. Calculus -Based Physics II Lab**1 Credit (3P)**

A series of Laboratory experiments associated with the material presented in Calculus-Based Physics II. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-Based Physics II.

Prerequisite(s)/Corequisite(s): PHYS 1320G. Prerequisite(s): A C- or better in PHYS 2110L or PHYS 1310L.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment

PHYS 1321. Problems in Calculus-Based Physics II**0.5-1 Credits (.5-1)**

This is a supplemental course for Calculus-based Physics II.

Corequisite(s): PHYS 1320G.

PHYS 2110. Mechanics**3 Credits (3)**

Newtonian mechanics.

Prerequisite(s)/Corequisite(s): MATH 1511G or higher.

PHYS 2110L. Experimental Mechanics**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2110. Science majors.

Prerequisite(s)/Corequisite(s): PHYS 2110.

PHYS 2111. Supplemental Instruction to PHYS 2110**1 Credit (1)**

This Optional workshop as a supplement to PHYS 2110. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credit.

Corequisite: PHYS 2110.

Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2110, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2120. Heat, Light, and Sound**3 Credits (3)**

Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound. May be repeated up to 3 credits.

Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.

PHYS 2120L. Heat, Light, and Sound Laboratory**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2120. Science majors.

Prerequisite: a C- or better in PHYS 2110L or PHYS 1310L.

Prerequisite/Corequisite: PHYS 2120.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2121. Supplemental Instruction to PHYS 2120**1 Credit (1)**

This optional workshop supplements PHYS 2120 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 2120 to problem solving and quantitative analysis. May be repeated up to 1 credit.

Corequisite: PHYS 2120.

Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2121, apply quantitative analysis to solve problems involving wave propagation and interference, geometric optics, heat transfer and thermodynamics.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline

PHYS 2140. Electricity and Magnetism**3 Credits (3)**

Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 1521G. Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.

PHYS 2140L. Electricity & Magnetism Laboratory**1 Credit (3P)**

Laboratory experiments associated with the material presented in PHYS 2140.

Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G.

Prerequisite/Corequisite: PHYS 2140.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2141. Supplemental Instruction to PHYS 2140**1 Credit (1)**

Optional workshop as a supplement to PHYS 2140. The tutorial sessions focus on reasoning and hands-on problem solving.

Corequisite: PHYS 2140.

Learning Outcomes

1. Analyze real-world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2140, apply quantitative analysis to solve problems, including the use of symmetry to study electric and magnetic fields. Practice concepts of calculus applied to charge and current distributions.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2230G. General Physics for Life Science I**3 Credits (3)**

This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

Prerequisite: A C- or better in MATH 1220G or higher.

Learning Outcomes

1. Modeling: analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain phenomena or function; use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text; critique assumptions and determine how to test the validity of a model and use the comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: describe the motion of any object in terms of displacement, velocity, and acceleration; analyze external forces acting on an object and determine if a system is in equilibrium or relate the net force to changes in motion; predict or analyze motion using conservation laws for energy and momentum; analyze forces and torques for a rigid object in static equilibrium; for a static fluid determine pressure and the buoyant force; apply idealized models of fluid flow to the circulatory system; describe the properties of pressure waves known as sound, apply the model of standing waves to musical instruments and discuss how sound is used to sense the environment; predict qualitative changes in the internal energy of a thermodynamic system when energy has been transferred due to work or heat and justify those predictions using conservation of energy (First law of thermodynamics). Identify which heat transfer processes occur in a described situation.
3. Quantitative reasoning: use a physics problem-solving strategy (Identify relevant concepts; Introduce and study simplified models; Use symmetry arguments; Establish the relation between known and unknown quantities; Calculate a quantitative result using appropriate mathematical methods; Self-check reasonableness of assumptions and solutions); use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2230L. Laboratory to General Physics for Life Science I**1 Credit (1)**

Laboratory experiments in topics associated with material presented in PHYS 2230G.

Prerequisite(s)/Corequisite(s): PHYS 2230G. Restricted to Las Cruces campus only.

PHYS 2231. Supplemental Instruction to General Physics for Life Sciences I**1 Credit (1)**

This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.

Corequisite: PHYS 2230G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2230, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2240G. General Physics for Life Science II**3 Credits (3)**

This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.

Prerequisite: a C- or better in PHYS 1230G or PHYS 2230G, and MATH 1220G or higher.

Learning Outcomes

1. Modeling: analyze real world phenomena by constructing simplified idealized models (an abstract description) that allow making predictions or explaining a phenomena or function; use multiple representations to build and communicate the model, including sketches, mathematical expressions, diagrams or graphs; decide what information is relevant and critique assumptions and models of others; determine how to test the validity of a model and use comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: electric or magnetic fields can be used to describe interactions of objects that contain charges with their surroundings; changes that occur as a result of interactions are constrained by conservation laws (such as conservation of energy, conservation of charge or conservation of nucleon number); many macroscopic properties of materials can be described using microscopic models or related to their geometry; electromagnetic radiation can be modeled as a wave or as fundamental particles (photons); the direction of propagation of a wave may change when it encounters a boundary surface between two media of different properties (reflection or refraction); the spontaneous radioactive decay of nuclei is described by probability.
3. Quantitative reasoning: apply quantitative analysis and appropriate mathematical reasoning to describe or explain phenomena; use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations (e.g. field lines, equipotential lines) and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2240L. Laboratory to General Physics for Life Science II**1 Credit (1)**

Laboratory experiments in topics associated with material presented in PHYS 2240.

Prerequisite(s)/Corequisite(s): PHYS 2240G. Restricted to Las Cruces campus only.

PHYS 2241. Supplemental Instruction to General Physics for Life Sciences II**1 Credit (1)**

This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.

Corequisite(s): PHYS 2240G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2240, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2996. Special Topics**1-3 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

PHYS 2997. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

PHYS 303V. Energy and Society in the New Millennium**3 Credits (3)**

Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

PHYS 304. Forensic Physics**4 Credits (3+3P)**

Theories, laboratory, and field techniques in the area of forensic physics.

PHYS 305V. The Search for Water in the Solar System**3 Credits (3)**

Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.

PHYS 315. Modern Physics**3 Credits (3)**

An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles.

Prerequisite(s): a C- or better in MATH 2530G and PHYS 2140 or PHYS 1320G.

Learning Outcomes

1. Communication: an ability to communicate effectively with a range of audiences.
2. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 315 L. Experimental Modern Physics**3 Credits (1+6P)**

Elementary laboratory in modern physics which supports the subject matter in PHYS 315. Required for physics majors. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or 1320L.

PHYS 316. Supplemental Instructions to PHYS 315**1 Credit (1)**

This optional workshop supplements PHYS 315 "Modern Physics". Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.

Corequisite(s): PHYS 315.

PHYS 325. Intermediate Experimental Physics**3 Credits (1+6P)**

An exploration of a variety of experimental techniques in physics with an emphasis on the proper determination of statistical and systematic uncertainties. Students will work in teams and prepare professional written and oral reports of their work. This course cannot be used to replace M E 345 for students majoring in engineering.

Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or PHYS 1320L.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 350. Special Topics**1-3 Credits**

Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

PHYS 380. Individual Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 395. Intermediate Mathematical Methods of Physics**3 Credits (3)**

Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. This course cannot be used to replace M E 228 or M E 328 for students majoring in engineering. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): MATH 392. Prerequisite(s): a C- or better in MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 400. Undergraduate Research**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 420. Capstone Project I**3 Credits (3P)**

Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

PHYS 421. Capstone Project II**3 Credits (3P)**

Continuation of PHYS 420.

PHYS 450. Selected Topics**1-3 Credits**

Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

PHYS 451. Intermediate Mechanics I**3 Credits (3)**

Newtonian mechanics, including an introduction to the Lagrangian formulation. Topics include central force motion, rigid body motion, noninertial reference frames, oscillating systems, and classical scattering.

Prerequisite(s)/Corequisite(s): MATH 392. **Prerequisite(s):** a C- or better in PHYS 2110 or PHYS 1310G, and MATH 2530G.

Learning Outcomes

1. Set up equations of motion for classical mechanical systems and solve them.
2. Identify conserved quantities and understand the circumstances under which they arise (symmetries); in particular, know how to use conservation of energy, momentum, angular momentum to solve problems.
3. Fluently use three-dimensional calculus as a language to do the above; be able to use spherical and cylindrical coordinates.
4. Understand the paradigmatic examples of the harmonic oscillator, central force (in particular, gravitational) motion and rigid body motion, which serve as starting points for investigating more complicated realistic problems.

PHYS 454. Intermediate Modern Physics I**3 Credits (3)**

Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension.

Prerequisite: a C- or better in PHYS 315.

Prerequisite/Corequisite: MATH 392 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 455. Intermediate Modern Physics II**3 Credits (3)**

Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms.

Prerequisite: a C- or better in PHYS 454, MATH 392, and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 461. Intermediate Electricity and Magnetism I**3 Credits (3)**

The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter.

Prerequisite: a C- or better in PHYS 2140 or PHYS 1320G or equivalent and a C- or better in MATH 2530G.

Prerequisite/Corequisite: MATH 392 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 462. Intermediate Electricity and Magnetism II**3 Credits (3)**

Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics.

Prerequisite: a C- or better in PHYS 461, MATH 392, and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 468. Intermediate X-ray Diffraction**3 Credits (3)**

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. **Prerequisite(s):** a C- or better in PHYS 315 and PHYS 325

Learning Outcomes

1. Knowledge of structural properties of materials
2. Experimental x-ray characterization techniques
3. Presentation and writing skills in the discipline
4. Ethics, teamwork, and career opportunities

PHYS 471. Modern Experimental Optics**3 Credits (1+6P)**

Cumulative experience course in experimental optics.

Prerequisite: a C- or better in PHYS 315 and PHYS 325.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 475. Advanced Laboratory Practices for Materials**3 Credits (1+6P)**

Cumulative experience course in advanced laboratory practices involving experiments in atomic, molecular, and condensed matter physics.

Prerequisite: a C- or better in PHYS 315 and (PHYS 315 L or PHYS 325).

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 476. Computational Physics**3 Credits (3)**

Scientific visualization, numerical differentiation and interpolation, numerical integration, root finding, linear algebra, eigensystems, ODE's, Boundary value problems, PDE's, Monte-Carlo calculations, data description and analysis, Fast Fourier Transforms, and applications to advanced physics problems. Recommended is the knowledge of a programming language.

Prerequisite(s): a C- or better in PHYS 1111 or equivalent and MATH 392.

Learning Outcomes

1. learn how to use computers for solving problems in the physical sciences,
2. obtain skills to implement numerical simulation and modeling strategies,
3. learn how to monitor and analyze data graphically, during and after computation,
4. obtain workflow organization skills needed for the solution of complicated systems.

PHYS 480. Thermodynamics**3 Credits (3)**

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases.

Prerequisite: a C- or better in PHYS 2120, PHYS 315, and MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 485. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of instructor.

PHYS 488. Introduction to Condensed Matter Physics**3 Credits (3)**

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties.

Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of solid-state physics: classification of solids, crystal structure, band structure of solids, lattice vibrations, optical and magnetic properties of solids.
2. Develop an ability to formulate and solve complex problems in solid state physics by applying the fundamental principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 489. Introduction to Modern Materials**3 Credits (3)**

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties.

Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 493. Experimental Nuclear Physics**3 Credits (1+6P)**

Cumulative experience course in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry.

Prerequisite: a C- or better in PHYS 315 and (PHYS 315L or PHYS 325).

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communications: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 495. Mathematical Methods of Physics I**3 Credits (3)**

Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.

Prerequisite(s): a C- or better in MATH 392 and PHYS 395.

Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 500. Special Topics Seminar**1-2 Credits**

Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

PHYS 511. Mathematical Methods of Physics I**3 Credits (3)**

Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.

Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 520. Selected Topics**1-3 Credits**

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetism, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: CHME 467. May be repeated up to 3 credits.

Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

PHYS 521. Individual Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

PHYS 528. Fundamentals of Photonics**4 Credits (3+3P)**

Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures.

Taught with E E 478. Crosslisted with: E E 528.

Prerequisite: (PHYS 1320G or PHYS 2120) and E E 473/PHYS 473.

Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

PHYS 551. Classical Mechanics**3 Credits (3)**

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

PHYS 554. Quantum Mechanics I**3 Credits (3)**

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

PHYS 555. Quantum Mechanics II**3 Credits (3)**

Continuation of topics in PHYS 554.

Prerequisites: PHYS 554 or consent of instructor.

PHYS 561. Electromagnetic Theory I**3 Credits (3)**

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

PHYS 562. Electromagnetic Theory II**3 Credits (3)**

Continuation of topics in PHYS 561.

Prerequisites: PHYS 561 or consent of instructor.

PHYS 568. Elements of X-ray Diffraction**3 Credits (3)**

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

PHYS 571. Advanced Experimental Optics**3 Credits (1+6P)**

Taught with PHYS 471 with additional work required at the graduate level.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 575. Advanced Physics Laboratory**3 Credits (1+6P)**

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 576. Advanced Computational Physics I**3 Credits (3)**

Advanced treatment of topics listed under PHYS 476 plus additional work. Applications of numerical methods to advanced physics problems. Recommended is the knowledge of a programming language.

Learning Outcomes

1. learn to numerically solve problems that require higher mathematical and theoretical analysis,
2. experience how graduate research will be advanced and accelerated by the use of scientific computing skills.

PHYS 584. Statistical Mechanics**3 Credits (3)**

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

PHYS 589. Modern Materials**3 Credits (3)**

Same as PHYS 489 with differentiated assignments for graduate students. PHYS 554 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 591. Advanced High-Energy Physics I**3 Credits (3)**

Taught with PHYS 491 with additional work required at the graduate level.

Prerequisite(s): PHYS 555 or consent of instructor.

PHYS 593. Advanced Experimental Nuclear Physics**3 Credits (1+6P)**

Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 597. Space Plasma Physics**3 Credits (3)**

Same as PHYS 497 but with added requirements.

PHYS 599. Master's Thesis**1-15 Credits (1-15)**

Thesis.

PHYS 600. Research**1-15 Credits**

Doctoral research. May be repeated.

PHYS 620. Advanced Topics in Physics**1-3 Credits**

Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.

Prerequisite: consent of instructor.

PHYS 650. General Relativity I**3 Credits (3)**

Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.

Prerequisite(s): PHYS 511 or PHYS 561 or consent of instructor.

PHYS 680. Independent Study**1-3 Credits**

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: graduate standing or consent of instructor.

PHYS 688. Advanced Condensed Matter Physics**3 Credits (3)**

Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

Learning Outcomes

1. Learn the fundamental concepts of advanced condensed state physics: band theory of solids, electronic structure methods, optical and magnetic properties of solids, bulk semiconductors, and properties of nano-structured materials.
2. Develop an ability to formulate and solve complex problems in advanced condensed matter physics.
3. Develop an ability to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 689. Advanced Modern Materials**3 Credits (3)**

Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. PHYS 555, PHYS 588, and PHYS 589 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystalline, amorphous, polymeric, nanostructured, layered, and composite materials.
2. Develop an ability to formulate and solve complex problems in the area of advanced physics of modern materials.
3. Develop an ability to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 691. Quantum Field Theory I**3 Credits (3)**

Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.

Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.

PHYS 692. Quantum Field Theory II**3 Credits (3)**

QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.

Prerequisite: PHYS 691 or consent of instructor.

PHYS 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation.

PL-S-PARALEGAL SERVICES

PL S 160. Legal System for the Paralegal**3 Credits (3)**

Introduction to the court system, administrative agencies, functions of law offices, and professional conduct and legal ethics. Restricted to: Community Colleges only.

Prerequisite(s): ACT standard score in English of 16 or higher or a Compass score 76 or higher; for those scoring 13-15 in English on ACT or 35-75 on Compass, successful complete of CCDE 105N or CCDE 110N; for those scoring 12 or below on the ACT standard score in English or 34 or below on the Compass, successful completion of CCDE 105N & CCDE 110N.

PL S 161. Legal Terminology**3 Credits (3)**

Survey of the language of the law that will serve either as an introductory course or as a review course to prepare students for the certification test.

PL S 162. The Virtual Law Office**3 Credits (3)**

The Virtual Law Office class is a 'hands-on', project oriented course designated to provide the student with the basic law office skills needed to function successfully in a law office setting. The student will gain a practical, working knowledge of the procedures necessary to work in a law office. The skills learned in the class will directly translate to real life situations. Restricted to: Community Colleges only.

Prerequisite(s): PL S 160.

PL S 180. Constitutional Law for the Paralegal**3 Credits (3)**

Case standing of the law of the Constitution and Bill of Rights with regard to day-to-day applications in the law practice. Documents dealing with constitutional problems in both civil and criminal areas of law will be drafted and discussed.

Prerequisite: PL S 160.

PL S 190. Criminal Law for the Paralegal**3 Credits (3)**

Introduction to federal and state criminal law; criminal proceedings, prosecution and defense, sentencing and appeal.

Prerequisite: PL S 160.

PL S 200. Legal Ethics for the Paralegal**3 Credits (3)**

Introduction to ethical dilemmas faced in the workforce and the rules of ethics developed by the American Bar Association, various national paralegal organizations, and the Supreme Court of New Mexico.

Restricted to: Community Colleges only.

Prerequisite(s): PL S 160.

PL S 203. Immigration Law**3 Credits (3)**

Survey of the basics of immigration law including the rights and obligations of citizenship and the naturalization process.

Prerequisite: PL S 160.

PL S 221. Internship I**2-4 Credits**

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships can be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. Restricted to Community Colleges campuses only.

Prerequisite(s): PL S 274.

PL S 222. Internship II**1-3 Credits**

Continuation of PL S 221. Each credit requires specified number of hours of on-the-job work experience. Restricted to Community Colleges campuses only.

Prerequisite(s): PL S 221.

PL S 231. The Law of Commerce for the Paralegal**3 Credits (3)**

Law of contracts, negotiable instruments, bank transfers, secured transactions, debtor-creditor relations, agency, and business types and their formation. Students will study the relevant statutes as well as draft documents associated with these types of legal practice. Restricted to: Community Colleges only.

Prerequisite(s): PL S 160.

PL S 272. Bankruptcy Law for the Paralegal**3 Credits (3)**

Individual and corporate bankruptcy; the basic principles and processes of bankruptcy law as a system of debtor relief and debt collection.

Prerequisite: PL S 160.

PL S 274. Legal Research and Writing for the Paralegal I**3 Credits (3)**

Legal memoranda, briefs, and pleadings will be prepared and written based on the student's original research. Research materials and techniques will be identified and studied; introduction of computer usage in legal research.

Prerequisite: PL S 160 and ENGL 1110G.

PL S 275. Tort and Insurance for the Paralegal**3 Credits (3)**

Primary legal principles of tort and insurance law and means of establishing insurance plans, types of torts and insurance, as well as use of specific forms and procedures relating to these areas.

Prerequisite: PL S 160.

PL S 276. Wills, Trusts, and Probate for the Paralegal**3 Credits (3)**

Cases and statutes dealing with wills, trusts, and probate. Emphasis on preparation and drafting of documents and the application of the law and documents to the client's problems.

Prerequisite: PL S 160.

PL S 277. Family Law for the Paralegal**3 Credits (3)**

Methods of conducting client interviews and drafting of pleadings and research relative to families. Laws relating to marriage, divorce, custody, support, adoption, name change, guardianship, and paternity.

Prerequisite: PL S 160.

PL S 278. Litigation for the Paralegal**3 Credits (3)**

The law of procedure and evidence will be considered through rules and cases. Case situations will be used to identify and solve problems.

Prerequisite: PL S 160.

PL S 279. Legal Research and Writing for the Paralegal II**3 Credits (3)**

Continuation of PL S 274. Advanced training in legal research problems with a focus on analysis, writing, and preparation of sophisticated legal memoranda and documents.

Prerequisite: PL S 274.

PL S 280. Interviewing and Investigation for the Paralegal**3 Credits (3)**

Techniques of legal interviewing and investigation with emphasis on development of human relations and communication skills.

Prerequisite: PL S 160.

PL S 298. Independent Study**1-3 Credits (1-3)**

Individual studies directed by consenting faculty with prior approval by department head. Restricted to Community Colleges campuses only.

Prerequisite(s): PL S 160.

PLEN-PLANT,ENVRMTL SCIENCES

PLEN 6110. Arid Land Water Resources**3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. Students will develop literature reviews, draft proposals, and conduct presentations. May be repeated up to 3 credits.

PLEN 6120. Instrumentation in Agronomy**3 Credits (3)**

Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. May be repeated up to 3 credits.

PLEN 6210. Scientific Writing- How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review.

PLEN 6320. Advanced Soil Physics**3 Credits (3)**

Advanced treatment of soil physics, modeling, includes working on an existing/new research project, modeling existing or new data, step by step guide on the use of some 1-D and 2-D models. Specific areas of specialization will be field scale variability of soil properties, water flow, solute transport, and plant water relations. May be repeated up to 3 credits.

PLEN 6410. Moisture Heat Contaminant Transport Modeling**3 Credits (3)**

Provides clear coverage of the basic principles of heat, moisture and contaminant transport through porous media, and a step-by-step guidance and hands on application on the use of some spreadsheet based and physically based one-and two-dimensional transport models. A similar course does not exist in the college for students that can encourage them to pursue modeling as a means of solving vadose zone and groundwater contamination and remediation problems. Consent of instructor required. May be repeated up to 3 credits.

PLEN 6415. Breeding for Plant Disease Resistance**3 Credits (3)**

A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. May be repeated up to 3 credits.

PLEN 6420. Advanced Crop Breeding**4 Credits (3+3P)**

Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. May be repeated up to 4 credits.

PLEN 6425. Biometrical Genetics and Plant Breeding**3 Credits (3)**

A statistical approach to gene action and population parameters as applied to plant improvement. May be repeated up to 3 credits.

PLEN 6810. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. May be repeated up to 3 credits.

PLEN 6910. Doctoral Seminar**1 Credit (1)**

Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. May be repeated up to 2 credits.

PLEN 6920. Doctoral Proposal**1 Credit (1)**

Current research proposal written by doctoral level graduate students. Not more than 1 credits toward the degree. May be repeated up to 1 credit.

PLEN 6991. Doctoral Research**1-15 Credits (1-15)**

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

PLEN 6996. Advanced Topics**1-6 Credits (1-6)**

Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits.

PLEN 7000. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

POLS-POLITICAL SCIENCE

POLS 1110G. Introduction to Political Science**3 Credits (3)**

This course covers fundamental concepts in political science, such as political theories, ideologies, and government systems.

Learning Outcomes

1. Construct reasoned civic discourse to advocate a stance or examine alternate positions.
2. Identify fundamental concepts and theories in political science.
3. Analyze data and information in order to gain a deeper understanding of the material.
4. Articulate how the public influence and are influenced by politics.
5. Identify and compare government systems from democracy to authoritarian, as well as models of analysis of contemporary international relations.

POLS 1111. Introductory Government Seminar**1 Credit (1)**

Introduction to the government major. Designed to assist students in planning college experience and preparing for upper division course work and research. May be repeated up to 1 credit.

Learning Outcomes

1. This course is designed for the beginning government major.
2. Its goal is to improve your educational experience at the university and within the Department of Government. In this class we hope to develop some basic skills necessary for successful completion of a degree in Government.
3. These include the skills of critical reading, critical writing, oral presentation and research methods.
4. Additionally, we will use this seminar to introduce you to Government faculty, to plan your government degree and to acquaint you with the services and opportunities the department and the university has to offer.
5. Finally, we hope to begin the discussion of where you will go next, when you complete your degree in Government.

POLS 1120G. American National Government**3 Credits (3)**

This course explains the role of American national government, its formation and principles of the Constitution; relation of state to the national government; political parties and their relationship to interest groups. This course also explains the structure of the legislative, executive, and judicial branches.

Learning Outcomes

1. Explain the historical and political foundations of the government of the United States;
2. Explain the precursors to, and the development and adoption of the United States Constitution;
3. Explain the United States federal system, the basics of federalism, and the changing relationship of state and federal power;
4. Describe the power, structure and operation of the main institutions of government, namely the legislative, executive, judicial, and the federal bureaucracy;
5. Explain the development and role of political parties and interest groups;
6. Identify the constitutional basis of civil rights and civil liberties and their changing interpretation; and
7. Describe the role of demographics, public opinion and the media in American politics.

POLS 1130G. Issues in American Politics**3 Credits (3)**

This course is designed to introduce the students to the contemporary study of American political issues. The course analysis of government policies, examining various approaches to the economy, democracy and the structure and the function of American political institutions.

Learning Outcomes

1. Explain the basic themes and concepts of political science and their application to contemporary issues.
2. Explain the major forces, interests, and institutions of American democratic politics.
3. Describe and define how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions.

POLS 2120G. International Relations**3 Credits (3)**

This course covers the analysis of significant factors in world politics, including nationalism, national interest, political economy, ideology, international conflict and collaboration, balance of power, deterrence, international law, and international organization.

Learning Outcomes

1. Explain the interrelationships between countries and people in the world,
2. Demonstrate an awareness of current events in the world.
3. Describe several theories of International Relations
4. Explain and identify theories of power and decision making among states in the world.
5. Describe and evaluate issues that relate to International Politics, and how individuals are affected by them.
6. Describe the role of Intergovernmental Organizations in International Politics.
7. Identify the role war plays in International Politics.
8. Explain how economics is intertwined with International Politics.
9. Demonstrate an understanding of role of international terrorism and its impacts on global diplomacy. 1
10. Articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, history, government, and social institutions.

POLS 2996. Special Topics**3 Credits (3)**

Specific topics to be announced in Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

POLS 300. Political Research Skills**3 Credits (3)**

Introduction to methods of political analysis and fundamentals of research design, including basic methods for the collection and analysis of political data.

POLS 308. Prepping for Law School Admissions Test**1 Credit (1)**

This workshop helps students understand the law school application process and prepare to take the Law School Admissions Test (LSAT). May be repeated up to 2 credits.

Learning Outcomes

1. To prepare students to do well in the Law School Admissions Test (LSAT).
2. To help students understand the law school application process.

POLS 313. Model United Nations**3 Credits (3)**

Issues related to the United Nations and international law/organizations through simulations, discussions and research projects.

Prerequisites: GPA of 2.5 or better and consent of instructor.

POLS 314. Advanced Model UN**3 Credits (3)**

Advanced topics, research and preparation for Model United Nations activities. Consent of instructor required. Restricted to: Main campus only.

Prerequisite(s): POLS 313, minimum GPA 2.5.

POLS 315. Politics and Film**3 Credits (3)**

Exploration of political themes, images, and representation in film and other media. May be repeated for a maximum of 6 credits under different subtitles.

POLS 320. Making Public Policy**3 Credits (3)**

The course examines how U.S. public policy is made, including the examination of the major institutional and non-institutional players, politics, issues and power critical to the policy process. Interactive discussion sessions bridge theory to policy-making and political action in substantive policy issues. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of how public policy is made in the United States at various levels of government (federal, state and local) and in relation to demands from interest groups and other stakeholders
2. Develop knowledge of specific public policy areas (such as environmental policy, energy policy, etc.
3. Develop excellence in research skills as well as written and oral communication of topics in the area of domestic policy

POLS 321. Topics in Public Policy**3 Credits (3)**

Course examines issues in public policy. May be repeated up to 6 credits.

Learning Outcomes

1. Develop knowledge and analytical skills with regard to particular topics within the subfield of public policy

POLS 324. Environmental Policy & Administration**3 Credits (3)**

This course introduces students to the history, development and formation of the central dimensions of environmental policy, politics and administration in the United States. Students also explore key substantive environmental policy issues (energy policy, natural resource and waste management policies, national parks and wildlife protection, and air and water pollution), and the global dimensions of climate change, environmental justice and sustainability. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of historical and contemporary aspects of environmental policy, politics and administration in the United States
2. Develop ability to critically analyze environmental policy debates
3. Develop ability to effectively communicate analysis of environmental policy and administration in oral and written forms

POLS 325. Education Policy and Politics**3 Credits (3)**

Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy as the main approach. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the historical development and changing federal role in education policy, including major federal education laws and reforms.
2. Examine critical issues and trends in federal education policy, as well as the various actors and perspectives involved in education debates and decision-making.
3. Explore policy process theories and apply them to the analysis of federal education events.
4. Study in depth a federal education policy issue by examining its progress through the various stages of the policy process.

POLS 326. Public Policy & Indigenous Communities**3 Credits (3)**

Study of historical and contemporary public policy and law that deals with the special legal status of Native American tribes and tribal members.

Learning Outcomes

1. Become familiar with the body of public policy and the area of law that deals with the special legal status of Native American tribes and tribal members
2. Examine the history, the public policy and the law that has impacted the ability of these indigenous communities to exercise their inherent sovereignty
3. Investigate the history, legislation, policies and landmark cases that have shaped this important area of government in the United States

POLS 330. Introduction to Public Administration**3 Credits (3)**

Public administration involves the full range of government agencies, non-profit organizations, and private contractors involved in the implementation of public policy at the federal, state, and local level. This course introduces students to the formal study of public administration and will explore major challenges in public service, the management of public and non-profit organizations, administrative ethics and law, leadership theory, and financial and personnel management. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. Gain a strong foundation in the the major issues, theories and challenges of public administration
2. Develop skills to critically analyze key problems in public administration
3. Develop ability to effectively communicate the main issues, theories and challenges of public administration in both oral and written form

POLS 331. Special Topics in Public Administration**3 Credits (3)**

Special topics in public administration. May be repeated for a maximum of 6 credits under different subtitles.

POLS 335. Management of Nonprofit Organizations**3 Credits (3)**

This course provides an introduction to the nonprofit sector, its nature, scope, and functions, and an overview of a range of nonprofit management concerns and practices. Students will confront the critical issues facing the sector. Activities are designed to expand the management skills of students by offering analytical tools and knowledge, and providing opportunities to test the application of these skills. May be repeated up to 3 credits.

Learning Outcomes

1. Gain a strong foundation in the study of nonprofit organizations and management issues
2. Expand students' management skills
3. Gain experience in application of management skills

POLS 343. Congress and the Legislative Process**3 Credits (3)**

This class reviews the history, structure, membership, operation, power and culture of the American Congress. Restricted to: Main campus only.

Learning Outcomes

1. Develop knowledge of the functions and goals of the US Congress, specifically how federal legislation is drafted, debated and passed.
2. Develop skills in debating legislative bills through in-class simulations
3. Develop excellence in research and written and oral communication of significant topics in the study of the US Congress and legislative processes

POLS 345. The Supreme Court**3 Credits (3)**

This class studies the history and operation of the Supreme Court, as well as landmark cases that have shaped American government and the Court.

POLS 348. Political Parties and Interest Groups**3 Credits (3)**

Organization, principles, and functions of political parties and interest groups in the U.S.

POLS 350. Special Topics in American Government**3 Credits (3)**

Special topics in American government. May be repeated for a maximum of 6 credits under different subtitles.

POLS 353. Women and Politics**3 Credits (3)**

An examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Also explores the influence of feminism in changing women's roles socially, legally, and politically.

POLS 354. Native American Politics**3 Credits (3)**

This course explores the rights of Native Americans and the politics, policy, and administration of tribal governments with a focus on the history and current relationship between Native Nations and the US political system. Students will learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization.

Restricted to: Main campus only.

Learning Outcomes

1. Develop a strong understanding of historical and contemporary issues in Native American policy in the United States
2. Develop skills to critically analyze debates over Native American policy
3. Develop skills to effectively communicate analysis of Native American policy in oral and written forms

POLS 360. International Relations Theory**3 Credits (3)**

Introduction to major theories and concepts for understanding fundamental problems and issues in international relations. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and critically evaluate the major concepts (theory) and practices (reality) of International Relations
2. Identify, define, and critically think about themes and key issues unique to International Relations and evaluate their pros and cons
3. Develop knowledge, analytical ability and critical thinking about global efforts and challenges to International Relations

POLS 361. Special Topics in International Relations**3 Credits (3)**

Course examines contemporary issues in international relations. May be repeated under different subtitles.

POLS 362. International Political Economy**3 Credits (3)**

Political factors in international economic relations; theories of political economy.

POLS 364. National Security**3 Credits (3)**

Analysis of theories, concepts, historical development and current issues of significance for US national security

Learning Outcomes

1. Analyze international issues from a National Security policy perspective and examine major theoretical approaches (or "paradigms") of National Security
2. Critically examine the historical evolution and the most prominent and contemporary challenges of National Security
3. Acquire abilities to synthesize and articulate important debates in the National Security literature and connect them to current national, regional, and global crises.

POLS 365. Introduction to Security Studies**3 Credits (3)**

Introduction to the field of security studies, with focus on theories and issues in the study of security in international politics, including emerging 21st century security challenges related to cyberspace, A.I., information warfare and virtual deterrence.

Learning Outcomes

1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or "paradigms") of security studies
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 366. American Foreign Policy**3 Credits (3)**

Formulation, content and rationale of current foreign policies of the U.S. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of the historical development and current practice of US foreign policy
2. Develop the skills necessary to conduct independent research and written and oral communication of significant topics in US foreign policy

POLS 367. Terrorism**3 Credits (3)**

An introductory course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism.

POLS 368. Human Security**3 Credits (3)**

Introduction to human security, its focus on security of the individual as opposed to the security of the state since the end of the Cold War and the emergence of global challenges such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes

1. Identify and critically evaluate the major concepts and practices in human security
2. Define, identify and critically think about key issue areas in human security
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 370. Comparative Politics**3 Credits (3)**

Comparative study of similarities and differences to be found in political systems across the world, with emphasis on the structure and performance of modern states, accountability of government institutions, parties and elections, social movements, and public policies. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of main issues and concepts in the study of comparative politics.
2. Increase analytical ability to explain similarities and differences between political systems
3. Promote critical thinking regarding the human and environmental consequences of government policies in addressing common public policy problems.

POLS 371. Latin American Politics**3 Credits (3)**

Comparative study of government systems and political change in Latin American countries, with focus on challenges of social inequality, democratization, regional integration, relations with the United States, and the rights of women, LGBTQ* community, Indigenous and Afro-descendent peoples. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of how historical legacies, domestic politics, and global relations shape contemporary politics in Latin America
2. Increase analytical ability to explain similarities and variation in contemporary politics in Latin America
3. Develop critical thinking regarding how to explain the persistence and political implications of socioeconomic inequalities and discrimination in Latin America
4. Develop oral and written communication skills in expressing knowledge, concepts, and comparative analysis

POLS 372. Special Topics in Comparative Politics**3 Credits (3)**

Course examines contemporary issues in comparative politics. May be repeated under different subtitles. Restricted to: Main campus only.

POLS 373. Resistance Movements in World Politics**3 Credits (3)**

Comparative study of contemporary resistance movements and social protests around the world with a focus on their origins, demands, ideologies, strategies and impacts. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of concepts of power and resistance movements and their applicability in many parts of the world.
2. Increase analytical ability to explain variation in the motives, strategies and impacts of resistance movements.
3. Promote critical thinking regarding how we choose to address inequalities, injustices and dissent.
4. Develop oral and written communication skills of key concepts and original research.

POLS 378. U.S.-Mexico Border Politics**3 Credits (3)**

Analysis of contemporary challenges facing the U.S.-Mexican border, including immigration, binational cooperation, drug trafficking, corruption, human rights violations and security. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of the main issues and controversies in US-Mexico border politics.
2. Increase analytical ability to explain the implementation and results of border policies for local communities and the environment.
3. Promote critical thinking regarding the merits of alternative policies and future possibilities.

POLS 379. Mexican Politics**3 Credits (3)**

Study of the politics and government of contemporary Mexico with focus on challenges of democratization, human rights, public policies, Mexico-US relations, and internal security. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of main issues and concepts in the study of Mexican politics.
2. Develop ability to conduct online research on current issues in Mexican politics.
3. Promote critical thinking regarding the causes and consequences of criminal violence in Mexican politics and how it may be best addressed.

POLS 380V. Contemporary World Political Ideologies**3 Credits (3)**

Introduction to the prevailing political ideologies in the modern world and the ways in which modern nations operating under one or more of these ideologies attempt to answer fundamental questions about the allocation and distribution of rights, liberties, and other things of value. In addition, the course work and discussions attempt to address recent political, social, and economic events in various areas of the world.

POLS 382. Classical Political Thought**3 Credits (3)**

Analysis of main currents in political thought from ancient Greece and Rome to the high Middle Ages.

POLS 383. Modern Political Thought**3 Credits (3)**

Historical and theoretical examination of political ideas and ideologies from Machiavelli to Nietzsche. Topics include liberalism, conservatism, romanticism, communism, and Nihilism.

POLS 385. American Political Thought**3 Credits (3)**

Introduction to major American thinkers and historical currents from colonial time to the present. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the nature of the specifically American form of constitutionalism, as compared to its alternatives;
2. To understand the idea of progress in American history, including its colonial origins and its contemporary manifestation under the terms of progressivist ideology;
3. To understand the meaning and origin of American conservatism, and its place in contemporary political life;
4. To understand the dynamics of shifting political and institutional power relationships (including issues of centralization and decentralization) in relation to the above; and
5. To understand the general relationship between cultural phenomena and questions of political order.

POLS 387. Religion and Politics**3 Credits (3)**

Survey of major points of interaction between politics and religion in the U.S., using theoretical, historical, and institutional analysis.

POLS 390. Special Topics in Public Law**3 Credits (3)**

Course examines various issues in public law. May be repeated under different subtitles.

POLS 391. Constitutional Law**3 Credits (3)**

The class explores the reasoning and political context of the Supreme Court cases that define the distribution and limits of governmental powers and duties under the U.S. Constitution, including separation of powers and federalism. Restricted to: Main campus only.

POLS 392. Civil Liberties**3 Credits (3)**

The course examines the reasoning and political context of major Supreme Court cases defining constitutional rights of free speech, religious liberty, free press and criminal procedural rights.

POLS 394. Judicial Process**3 Credits (3)**

Class examines the structure, function and purpose of the American judicial system. Restricted to: Main campus only.

POLS 395. Law and Society**3 Credits (3)**

Class critically explores the development, role and impact of law on society, covering different philosophies and theories of law, different world legal systems, and different issue areas of law and society. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the development, role and impact of law on society
2. To gain knowledge of different philosophies and theories of law
3. To gain knowledge of different legal systems around the world and key issues in law and society
4. To gain skills in critical analysis of debates in law and society
5. To gain skills in effective communication of analysis of law and society in oral and written forms

POLS 396. International Law**3 Credits (3)**

Nature, growth, and scope of law of nations, rights and obligations of states in peace and war, current issues.

POLS 399. New Mexico Law**3 Credits (3)**

Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico.

Crosslisted with: CJUS 399. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analyze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

POLS 405. Directed Readings**1-3 Credits**

Individualized readings. Course subtitled. May be repeated for a maximum of 6 credits. Graded S/U. Consent of instructor required.

POLS 406. Independent Study**1-3 Credits**

Individualized research. Course subtitled. May be repeated for a maximum of 6 credits. Consent of instructor required.

POLS 407. Workshop**1-6 Credits (1-6)**

Focus on skills related to careers in government and political science. Specific topics announced in the Schedule of Classes; Only three credits apply toward government major or minor requirements. May be repeated up to 6 credits.

Learning Outcomes

1. Develop skills related to careers in government and public service

POLS 410. Internship**1-12 Credits**

Hands-on experience working with public agencies, political campaigns, elected officials & non-profits. May be repeated for a maximum of 12 credits; only 3 credits apply toward government major or minor requirements. Consent of instructor required. Graded: S/U.

Prerequisite(s): Completion of 12 government credits, 2.5 GPA, junior and above standing.

POLS 411. Service Learning Experience**3 Credits (3)**

Experiential learning through a community service project. May be subtitled to reflect service activity. May be repeated for a total of 6 credits; only 3 credits apply toward government major or minor requirements.

Prerequisites: completion of 12 government credits, junior or above standing, and consent of instructor.

POLS 412. Practicum in Student Government**3 Credits (3)**

Research of issues in student government. Consent of instructor required. Graded: S/U.

Prerequisite(s): Student government participation, completion of 12 POLS credits, junior or senior standing.

POLS 415. Senior Seminar**2 Credits (2)**

Review and integration of political skills acquired in the Government Department. Students will focus on critical essay writing and oral presentation of a synthesis of knowledge gained from prior departmental coursework. May be repeated up to 2 credits.

Learning Outcomes

1. To integrate knowledge from various classes during the students' coursework as a Government major.
2. To effectively communicate in oral and written forms a synthesis of main issues, theories, scholars and actors in the various sub-fields of the government major.

POLS 468. Rebels, Guerrillas, and Terrorists in Modern Latin America**3 Credits (3)**

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Columbia's FARC, and Mexico's Zapatistas. Same as HIST 331.

POLS 469. Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOCI 4460. May be repeated up to 3 credits.

POLS 493. Mass Communications Law**3 Credits (3)**

Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as JOUR 493 and COMM 493.

POLS 502. Research Methods in Government**3 Credits (3)**

Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications. MPA students must complete this class with a B- or better. MA students must complete either POLS 502 or POLS 503 with a B- or better.

POLS 503. Qualitative Research Methods**3 Credits (3)**

An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology (the study of knowledge) and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects. MA students must complete either POLS 503 or POLS 502 with a B- or better.

POLS 505. Directed Readings**1-3 Credits**

Selected topics in government. May be repeated for a total of 6 credits. Graded S/U.

Prerequisite: consent of instructor.

POLS 510. Internship**1-6 Credits**

Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U.

Prerequisite: approval of graduate advisor.

POLS 517. Selected Topics in Government**3 Credits (3)**

Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.

POLS 519. Proseminar in Public Administration**3 Credits (3)**

Review of classic and contemporary theory and practice in public administration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. To be completed with a B- or better.

Prerequisite(s): 30 credits of M.P.A.

POLS 522. Public Sector Economics I**3 Credits (3)**

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as AEEC 522.

POLS 527. Issues in Public Management**3 Credits (3)**

Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.

POLS 530. Seminar in Public Policy**3 Credits (3)**

Survey of the political, administrative, and technical aspects of policy making in government. MA students taking POLS 530 as part of their core requirements must complete the class with a B- or better.

POLS 536. Public Policy and Indigenous Communities**3 Credits (3)**

Indigenous communities are found throughout North, Central and South America. This course addresses the history, development and governance of these communities. Different sections of the course may choose to focus on different indigenous communities. All courses will consider the principles of governance internal to indigenous communities as well as the governing relationships between indigenous communities and modern states.

POLS 537. Issues in Public Policy**3 Credits (3)**

Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.

POLS 540. Seminar in Public Administration**3 Credits (3)**

Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector. MA students taking POLS 540 as part of their core requirements must complete the class with a B- or better.

POLS 541. Public Budgeting**3 Credits (3)**

Budgetary processes; budget classification, analysis, and evaluation. MPA students must complete this class with a B- or better.

POLS 542. Public Sector Human Resources Management**3 Credits (3)**

Exploration of public personnel systems and practices, including job analysis, compensation, performance evaluation, recruitment, and labor-management relations. MPA students must complete this class with a B- or better.

POLS 543. Skills Workshop**1-6 Credits (1-6)**

Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specific skills related to the practice of public administration

POLS 544. Public Policy Analysis**3 Credits (3)**

Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. MPA students must complete this class with a B- or better.

Prerequisite(s): POLS 502 or consent of instructor.

POLS 547. Government Organizations**3 Credits (3)**

Historical overview and present applications of organization theory in public management. MPA students must complete this class with a B- or better.

POLS 548. Public Sector Leadership**3 Credits (3)**

Theories and styles of leadership.

POLS 549. Ethics in Government**3 Credits (3)**

Examination of standards, perspectives, and issues for ethical decision-making in public agencies. MPA students must complete this class with a B- or better.

POLS 550. Seminar in American Politics**3 Credits (3)**

Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation. MA students taking POLS 550 as part of their core requirements must complete the class with a B- or better.

POLS 560. Seminar in International Relations Theory**3 Credits (3)**

A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics. MA students taking POLS 560 as part of their core requirements must complete the class with a B- or better.

POLS 563. Issues in International Relations**3 Credits (3)**

Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.

POLS 564. Advanced National Security Policy**3 Credits (3)**

Major topical, theoretical, and regional issues in national security policy.

POLS 565. Advanced Issues in Security Studies**3 Credits (3)**

Advanced study of theories, concepts and key issues in the area of security studies, including historical security problems and emerging 21st century challenges related to cyberspace, A.I., information warfare and virtual deterrence.

Learning Outcomes

1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or "paradigms") of security studies.
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies.
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 567. Advanced Issues in Terrorism**3 Credits (3)**

Advanced study of theories of the causes of terrorism, responses to varieties of terrorism, and major issues in the study of terrorism, historically and today

Learning Outcomes

1. Examine core ideas in studies of terrorism (theoretically and factually)
2. Introduce and develop an understanding about the causes of terrorism and possible solutions
3. Acquire abilities to gain knowledge, think critically, analytically, and synthetically of countries and violence, and varieties of terrorism over time and throughout the world.

POLS 568. Advanced Issues in Human Security**3 Credits (3)**

Advanced study of major theories, concepts and issues in the study of human security, such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes

1. Identify and critically evaluate the major concepts and practices in human security;
2. Define, identify and critically think about key issue areas in human security.
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 569. Advanced Issues in Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOCI 5460. May be repeated up to 3 credits.

POLS 570. Seminar in Comparative Politics**3 Credits (3)**

Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries. MA students taking POLS 570 as part of their core requirements must complete the class with a B- or better.

POLS 574. Contemporary Comparative Studies**3 Credits (3)**

Major topical, theoretical, and regional issues in international politics. May be repeated once.

POLS 578. Seminar in the U.S.-Mexican Border**3 Credits (3)**

An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.

POLS 579. Seminar in Mexican Politics**3 Credits (3)**

Advanced research on politics and government of Mexico.

POLS 580. Seminar in Political Theory**3 Credits (3)**

Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter. MA students taking POLS 580 as part of their core requirements must complete the class with a B- or better.

POLS 587. Seminar in Religion and Politics**3 Credits (3)**

Historical, theoretical and comparative analyses of the interaction between politics and religion.

POLS 593. Issues in Public Law**3 Credits (3)**

Selected issues in public law. May be repeated under a different subtitle for a total of 6 credits.

POLS 596. International Law**3 Credits (3)**

Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.

POLS 598. Special Research Programs**1-3 Credits**

Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.

POLS 599. Master's Thesis**1-15 Credits**

Thesis.

PORT-PORTUGUESE

PORT 1110. Portuguese I**3 Credits (3)**

Designed for students with no previous exposure to Portuguese, this course develops basic listening, speaking, reading, and writing skills. This is an introductory course aimed at teaching the student to communicate in Portuguese in everyday situations.

Learning Outcomes

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can handle most short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can make connections between beliefs, behaviors and cultural artifacts of the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 1120. Portuguese II**3 Credits (3)**

A continuation of Portuguese I, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing Portuguese. Students will also gain more in-depth knowledge of Portuguese-speaking cultures.

Prerequisite: C or better in PORT 1110 or consent of instructor.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write about familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can begin to narrate and describe simple events in the past.
8. Students can make broader connections between beliefs, behaviors and cultural artifacts of the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 453. Independent Luso-Brazilian Studies**1-3 Credits (1-3)**

Individualized, self-paced projects for advanced students in Luso-Brazilian studies. May be repeated up to 12 credits. Consent of instructor required.

**PORT 513. Graduate Portuguese for Romance Language Students I
3 Credits (3)**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

**PORT 514. Graduate Portuguese for Romance Language Students II
3 Credits (3)**

Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

Prerequisite(s): Language placement exam or C or better in PORT 513, or consent of instructor.

PSYC-PSYCHOLOGY

PSYC 1110G. Introduction to Psychology

3 Credits (3)

This course will introduce students to the concepts, theories, significant findings, methodologies, and terminology that apply to the field of psychology.

Learning Outcomes

1. Explain how the scientific method and psychological research methodologies are used to study the mind and behavior.
2. Recall key terms, concepts, and theories in the areas of neuroscience, learning, memory, cognition, intelligence, motivation and emotion, development, personality, health, disorders and therapies, and social psychology.
3. Explain how information provided in this course can be applied to life in the real world.
4. Identify the major theoretical schools of thought that exist in psychology as they relate to the self, the culture, and the society.

PSYC 2110. Social Psychology

3 Credits (3)

This course is an introduction to the scientific study of human social influence and interaction, and explores how an individual's actions, emotions, attitudes and thought processes are influenced by society and other individuals. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Identify concepts, theories, scientific methods, and research findings relevant to social psychology.
2. Explain how situational, social, and individual factors influence behavior.
3. Apply social psychological concepts to real-life events, current social issues and problems, and one's own life.

PSYC 2120. Developmental Psychology

3 Credits (3)

Study of human physical and psychological change and stability from a lifespan development perspective. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Explain theories, methods and research findings of lifespan developmental psychology.
2. Describe the interaction between physical, cognitive, and psychosocial development across the lifespan.
3. Compare and contrast major developmental theories and discuss what each brings to or adds to the study of lifespan developmental psychology.
4. Identify factors that influence psychological development across the lifespan.
5. Apply basic principles of developmental psychology to one's own life experiences.
6. Analyze historical and cultural factors that influence development across the lifespan.

PSYC 2210. Abnormal Psychology

3 Credits (3)

This course provides students with an introduction to the field of abnormal psychology. Subject areas include history, methods, theories, etiologies, classification and treatment of disorders. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215 and ENGL 1110G.

Learning Outcomes

1. Recognize terms used within the field of abnormal psychology.
2. Compare various methods for defining abnormal behavior.
3. Evaluate the development of classification systems that define "normal" and "abnormal" from historical, social, and cultural contexts.
4. Critically evaluate the symptoms and etiologies of mental health disorders in the current psychological diagnostic system.
5. Describe treatment modalities for mental health disorders.
6. Identify biological and psychological processes in mental health disorders.

PSYC 2220. Cognitive Psychology

3 Credits (3)

The course provides an overview of human cognitive processes such as attention, perception, memory, language, categorization, decision-making, reasoning, and problem solving. Includes methods, theories, and applications. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Describe research findings in the major areas of human cognition.
2. Differentiate the research methods used to study the various topics in cognitive psychology.
3. Apply theories of cognition to the results of laboratory research.
4. Apply the research on cognitive psychology to topics in the real world.

PSYC 2221. Applied Psychology**3 Credits (3)**

Explanation of the psychological principles of everyday living. Emphasizes motivation, learning of intelligent behavior, and applications of psychology to social issues. Community Colleges only.

Learning Outcomes

1. The objective of this course is to orient students to the personality characteristics, interpersonal competencies, ethical decision-making skills, and other professional traits associated with pursuing a career in a helping profession.
2. Identify the requirements for becoming a helping professional, characteristics of a skilled helper, and cultural factors that impact helping professionals
3. Explain your personal strengths and weaknesses as a potential helper.
4. Demonstrate appropriate helping strategies based upon the special characteristics of clients.
5. Compare the capabilities that individual, family, group, community, and online interventions offer you as a future helper.
6. Identify the ethical and legal issues that impact helping professionals
7. Analyze the potential impact of your future ethical and professional standards as a helping professional
8. Explain how your role as a helping professional is impacted by your professional affiliation and ethical principles
9. Analyze how worsening personal problems and increasing stress can impact the kinds and quality of our responses to life and the people around us.

PSYC 2230. Psychology of Adjustment**3 Credits (3)**

This course focuses on the individual's adjustment to society, and the application of psychological principles to the understanding of adjustment.

Learning Outcomes

1. Explain the internal and external factors associated with the psychology of adjustment.
2. Evaluate contributions from psychology to adjustment concepts and processes.
3. Describe the different explanations of how individuals adjust to their environments.
4. Describe how self-identities develop and how they affect relations with others.
5. Identify resources available for assistance with adjustment-related concerns.

PSYC 2311. A Study of Substance Abuse through Learning**3 Credits (3)**

Physiological and psychological impact of drug use on human behavior. Emphasizes practical applications of intervention and prevention in the community. Community Colleges only.

Learning Outcomes

1. Through readings and discussions, students will be able to describe the role that gender, ethnicity, and age have in alcohol and drug use.
2. Through readings and discussions, students will be able to learn past and current perspectives of addiction.
3. Through readings, discussions and student presentations, students will be able to distinguish between different types of abuse-able drugs and be able to classify them.
4. Through readings, discussions, lectures and guest speaker's students will be able to describe the role of addiction and criminal behavior.
5. Through readings and discussions, students will be able to discuss the Models and Theories of Drug Dependence and Addiction.
6. Through readings, discussions and evaluation of case studies students will be able to discuss the definitions of Substance Abuse, Dependence Addiction.
7. Through readings and discussions, students will be able to acquaint themselves with the effects of Addictive Behavior on Family Systems.
8. Through readings discussions, students will be able to Discuss Disorders Co-Occurring with Substance Abuse
9. Through readings and community service learning outing, students will be able to discuss how important the concepts of Prevention, Intervention and Treatment in drug addiction.1
10. Through readings and community service learning outing students will be able to discuss Alcohol/Drug Recovery Treatment Relapse Prevention 1
11. Through completion of Service Learning and field assignment students will be able to discuss the role of AA/NA in Recovery Treatment. 1
12. Through attendance of a Drug Court Hearing students will be knowledgeable of the role of Drug Courts in prevention and treatment of drug addiction.

PSYC 301. Introduction to Psycholinguistics**3 Credits (3)**

Psychological aspects of language, including linguistic theories of grammar, psychological factors influencing language performance, primary language acquisition and the relationship of language to thought processes. Same as LING 301.

Prerequisites: PSYC 1110G and one of: MATH 1350G, MATH 2350G, or A ST 311; and PSYC 310 or consent of instructor.

PSYC 310. Experimental Methods**4 Credits (2+4P)**

The basic skills of literature search, experimental design, research methodology, and research reporting are emphasized; includes laboratory.

Prerequisite(s): PSYC 1110G, and either MATH 1350G, MATH 2350G, or A ST 311.

PSYC 311. Advanced Research Seminar**4 Credits (2+4P)**

Psychological research in conjunction with designing, conducting, writing, and presenting an independent research project. May also include various computer applications. Will discuss issues regarding application to graduate programs. Course should be taken no later than the first semester of senior year.

Prerequisite: PSYC 310.

PSYC 315. Emotion**3 Credits (3)**

An overview of the past century of research on human emotion from William James to Antonio Damasio. Explores a cognitive science perspective on emotion that includes questions about developmental, physiological, and evolutionary aspects of emotion and an exploration of the proximate and ultimate functions of emotion. Topics range from understanding the feeling component of emotion to understanding the role of facial displays of emotion.

Prerequisite(s): PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 310 or consent of instructor.

PSYC 320. Learning**3 Credits (3)**

Covers: habituation, Pavlovian conditioning, Thorndikian learning, stimulus generalization, transfer of training, and the learning and forgetting of related and unrelated material. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310.

Learning Outcomes

1. Recognize and distinguish between various learning situations, especially classical/Pavlovian and Instrumental learning and their many facets and applications.
2. Identify some of the key conditions necessary for learning to take place, and that may prevent learning from taking place – rather more nuanced than most intro psych books suggest.
3. Identify and evaluate different basic situations to suggest how learning might be structured to cause changes in behavior in both humans and other animals.

PSYC 321. Psychology of Personality**3 Credits (3)**

Introduces personality theories and supporting research. Psychoanalytic, physiological, and behavioral theories as they apply to personality are examined. Focuses on normal personality functioning.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310.

PSYC 324. Sexual Behavior**3 Credits (3)**

Examines viewpoints of the evolution, control and function of human sexual behavior. Includes human sexuality, reproduction, male-female conflicts and the social implications of sex. **Prerequisites:** PSYC 1110G, MATH 1215, and ENGL 1110G

PSYC 325. Health Psychology**3 Credits (3)**

Life stress, surgical stress, coronary-prone behavior, biofeedback, pain control, psychosocial approaches to geriatrics and cancer, behavioral treatments for addictions, obesity, and interpersonal issues in health care.

Prerequisite: PSYC 1110G.

PSYC 330. Psychology and the Law**3 Credits (3)**

Discretionary practices in the judicial system including pretrial procedures, jury selection, jury decision making, eyewitness testimony, insanity, expert witnesses, and probation judgments.

Prerequisite: PSYC 1110G.

PSYC 359. Psychology of Gender**3 Credits (3)**

Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: GNDR 359.

Prerequisite: PSYC 1110G.

PSYC 370. Special Topics**1-3 Credits**

May be taken under different subtitles announced in the Schedule of Classes for unlimited credit. May be repeated for a maximum of 12 credits.

Prerequisite: PSYC 1110G.

PSYC 375. Psychology and the Brain**3 Credits (3)**

An exploration of how the brain produces thinking, emotion, and behavior. May be repeated up to 3 credits.

Prerequisite(s): PSYC 1110G, MATH 1215 and ENGL 1110G.

PSYC 376. Evolutionary Psychology**3 Credits (3)**

This course introduces the student to the science of Evolutionary Psychology. In this class we will explore how evolutionary psychologists think about a variety of topics ranging from our capacity for (and appreciation of) art, emotions, and beauty to an exploration of the "design" of our minds in regards to mating, status striving, social behavior and cultural production.

Prerequisite(s): PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 310 or consent of instructor.

PSYC 380. Perception**4 Credits (4+4P)**

Primary emphasis on vision. Topics include measurement of sensations, development of visual-motor coordination, reading, speech perception, picture perception, illusions, 3-dimensional space, and causes and consequences of visual abnormalities.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310.

PSYC 383. Memory**3 Credits (3)**

Examines facets of human memory from the information processing viewpoint, including encoding, storage, and retrieval and memory-aiding techniques.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310 or consent of instructor.

PSYC 400. Research**1-3 Credits**

Individual research projects supervised by a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisites: PSYC 310 and consent of instructor.

PSYC 401. Directed Readings**1-3 Credits**

May be repeated for a maximum of 6 credits.

Prerequisites: PSYC 1110G and consent of instructor.

PSYC 402. Field Experience**1-3 Credits**

Working with preschool, juvenile delinquent, handicapped, aged, convict, or mentally ill. Approximately five hours scheduled work per week per credit. May be repeated to 6 credits.

Prerequisites: 6 psychology credits and consent of instructor.

PSYC 430. Human-Computer Psychology**3 Credits (3)**

Theories, methodologies, and data from psychology applicable to interface design, with an emphasis on construction and application of conceptual psychological models.

Prerequisites: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 310 or consent of instructor.

PSYC 441. History & Systems of Psychology**3 Credits (3)**

History of the scientific study of the mind and behavior. Covers the historical origins of philosophical and scientific approaches to Psychology and the development of influential schools of thought in psychology from the Classical Period through the Modern Era.

Prerequisite: PSYC 1110G and PSYC 310.

Learning Outcomes

1. Apply knowledge of important historical events/figures in scientific psychology by demonstrating an ability to explain how past ideas/thinkers/events have shaped current theory and methodology in scientific psychology.
2. Explain key ideas and concepts in contemporary scientific psychology by demonstrating an ability to draw connections between our current understanding and earlier approaches to the study of the mind.
3. Generate sophisticated arguments/opinions regarding contemporary questions in scientific psychology by demonstrating an ability to frame questions that draw upon a sophisticated understanding of the history of scientific psychology, while also being able to distinguish between well-informed and naïve answers to those questions.

PSYC 442. Thinking**3 Credits (3)**

Research and theory pertaining to human thinking and problem solving. Effective problem-solving methods and common obstacles to problem solving are analyzed.

Prerequisites: PSYC 1110G and PSYC 310.

PSYC 450. Senior Thesis**3 Credits (3)**

A laboratory or field research project conducted under faculty supervision. Requires written research proposal, conduct of research, data analysis, and final written report. May be repeated for a maximum of 6 credits.

Prerequisites: PSYC 310, 6 additional psychology credits, consent of supervising faculty member, and junior or above standing.

PSYC 470. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

PSYC 507. Quantitative Methods in Psychology I**3 Credits (3)**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on distributions, probability and basic inferential statistics in Psychological research. Includes basics of Analysis of Variance (ANOVA) and Multiple Regression in Psychological research. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to recognize appropriate usage of, and be able to implement, basic statistical techniques: Central tendency, variability, z-scores, t-tests, ANOVA, correlation, two predictor regression.

PSYC 508. Quantitative Methods in Psychology II**3 Credits (3)**

Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on advanced ANOVA and Multiple Regression in Psychological research. May be repeated up to 3 credits.

Prerequisite(s): PSYC 507 or equivalent.

Learning Outcomes

1. Students will become familiar with situations and applications of advanced ANOVA techniques and Multiple Regression and Correlation.

PSYC 509. Quantitative Methods in Psychology III**3 Credits (3)**

Advanced quantitative methods as applied to research in Psychology. Topics may include: Multivariate techniques, advanced Bayesian analyses, Random walk modelling etc. May be repeated up to 3 credits.

Prerequisite(s): PSYC 507 or equivalent.

PSYC 510. Computer Methodology**3 Credits (3)**

Use of computers in psychological research with emphasis on developing experimental control programs.

PSYC 520. Learning**3 Credits (3)**

Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.

PSYC 522. Sensation and Perception**3 Credits (3)**

Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.

PSYC 523. Methods in Cognitive Psychology**3 Credits (3)**

Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems.

Prerequisite(s): PSYC 524 or consent of instructor.

PSYC 524. Cognitive Psychology**3 Credits (3)**

Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.

PSYC 527. Social Psychology**3 Credits (3)**

Current and traditional theories, research findings, and research methodologies of social psychology.

PSYC 529. Methods in Social Psychology**3 Credits (3)**

Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems.

Prerequisite(s): Graduate student in psychology or consent of instructor.

PSYC 540. History and Systems of Psychology**3 Credits (3)**

History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.

PSYC 547. Engineering Psychology**3 Credits (3)**

Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.

PSYC 550. Teaching of Psychology**3 Credits (3)**

This class serves both new and experienced teachers. It will help new teachers design and conduct a successful course and help experienced teachers improve their teaching.

PSYC 570. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes.

PSYC 590. Research Seminar in Psychology**1 Credit (1)**

Presentations on research by students, faculty, and guest speakers. May be repeated for credit.

PSYC 598. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

PSYC 599. Master's Thesis**1-15 Credits**

Thesis.

PSYC 600. Doctoral Research**1-15 Credits**

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

PSYC 698. Special Research Programs**1-3 Credits**

Individual investigations either analytical or experimental. May be repeated for credit.

PSYC 700. Doctoral Dissertation**1-15 Credits**

Dissertation.

RADT-RADIOLOGIC TECHNOLOGY

RADT 100. Introduction to Radiologic Technology and Patient Care**3 Credits (3)**

Overview of the profession, including ethics, terminology, and basic radiation protection. Addresses basic and specialized procedures and topics related to the care of the patient. Restricted to: Community Colleges only. Restricted to Majors.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images
2. Students will demonstrate effective communication skills
3. Students will accurately document/record data in accordance with clinical site policies and procedures.
4. Students will demonstrate the ability to use independent judgment.
5. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 101. Radiographic Positioning I**2 Credits (2)**

Covers radiographic procedure and positioning concepts, techniques, terminology, and mechanics related to the thorax, abdomen, extremities, spine and pelvis. Includes positioning lab and clinical observation.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills. (CO-three, CO-four alignment)
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.

RADT 101 L. Radiographic Positioning I Applied Clinical Skills**1 Credit (3P)**

Applied clinical skills lab in radiographic procedures and positioning concepts, techniques, terminology, and mechanics related to the thorax, abdomen, extremities, spine and pelvis.

Corequisite: RADT 101.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills. (CO-three, CO-four alignment)
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.

RADT 102. Radiographic Positioning II**2 Credits (2)**

Continuation of RADT 101. Includes skull, gastrointestinal, urinary, reproductive, biliary systems, and more advanced skeletal positions. Includes positioning lab and clinical observation. Restricted to: Dona Ana campus only. Restricted to Majors.

Prerequisite: RADT 101.

Learning Outcomes

1. Students will demonstrate the ability to safely produce quality diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgment.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 102 L. Radiographic Positioning II Applied Clinical Skills**1 Credit (3P)**

Continuation of RADT 101. Applied Clinical Skills lab: Includes skull, gastrointestinal, urinary, reproductive, biliary systems, and more advanced skeletal positions.

Corequisite: RADT 102.

Learning Outcomes

1. Students will demonstrate the ability to safely produce quality diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgment.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 103. Introduction to Radiographic Imaging**2 Credits (2)**

Provides the student with an in-depth knowledge of radiographic exposure technique and the factors affecting radiographic image quality. Restricted to majors.

Learning Outcomes

1. Students will demonstrate the ability to safely produce quality diagnostic radiographic images.
2. Students will demonstrate effective communication skills.
3. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.

RADT 103 L. Intro to Radiographic Imaging Applied Clinic Skills**1 Credit (3P)**

Applied clinical skills lab to provide the student with an in-depth knowledge of radiographic exposure technique and the factors affecting radiographic image quality. Restricted to majors.

Corequisite: RADT 103.

Learning Outcomes

1. Students will demonstrate the ability to safely produce quality diagnostic radiographic images.
2. Students will demonstrate effective communication skills.
3. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.

RADT 104. Special Radiologic Modalities**2-3 Credits (2-3)**

Discussion of various special procedures used in medical imaging such as, angiography, ultrasound, computerized tomography, magnetic resonance imaging, digital imaging, nuclear medicine, radiation therapy, etc.

Prerequisite: RADT 103.

Learning Outcomes

1. Students will be able to appropriately position patients and to identify radiographic anatomy and pathological conditions.
2. Students will demonstrate appropriate and effective communication skills.
3. Students will conduct themselves in an ethical and professional manner and function effectively as a member of the healthcare team in accordance with the American Registry of Radiologic Technologists (ARRT) Standards and the American Society of Radiologic Technologist (ASRT) Code of Ethics.

RADT 105. Radiographic Physics and Equipment**3 Credits (3)**

Fundamentals of radiographic physics and imaging theory. Includes the atom, electromagnetism, x-ray production and interaction, electric x-ray circuitry, digital fluoroscopic units and digital x-ray equipment, and quality assurance/control. With brief overview of mammography, computed tomography (CT), and MRI imaging. May be repeated up to 3 credits.

Prerequisite/Corequisite: RADT 103.

Learning Outcomes

1. Students will have knowledge of and be able to operate radiographic equipment to produce quality diagnostic radiographic images
2. Students will demonstrate radiation safety application through ALARA Principles

RADT 110. Radiographic Pathology**3 Credits (3)**

Overview of pathology demonstrated by radiographic procedures. Restricted to RADT majors.

Prerequisite: RADT 154.

Learning Outcomes

1. Students will be able to appropriately position patients based on pathological findings and suspicions
2. Students will be able to identify radiographic anatomy and pathological conditions on radiographs.
3. Students will demonstrate the ability to make decisions and use independent judgment based on human pathologies.

RADT 111. Radiographic Positioning I Practicum**1 Credit (4P)**

Practicum in radiographic procedures and positioning concepts, techniques, terminology, and mechanics related to the thorax, abdomen, extremities, spine and pelvis. Includes

Corequisite: RADT 101.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills. (CO-three, CO-four alignment)
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.

RADT 112. Radiographic Positioning II Practicums**1 Credit (4P)**

Continuation of RADT 101. Practicum: Includes skull, gastrointestinal, urinary, reproductive, biliary systems, and more advanced skeletal positions.

Corequisite: RADT 102.

Learning Outcomes

1. Students will demonstrate the ability to safely produce quality diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgment.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 154. Radiographic Anatomy and Physiology**3 Credits (3)**

Basic A&P for radiographic application. Includes a systems approach to body structures and organs as they relate to anatomical projections, radiographic identification, and various imaging modalities. Restricted to: RADT majors. Restricted to: Community Colleges only.

Prerequisite(s): AHS 153 or AHS 140 or BIOL 2210 or BIOL 1130, or consent of instructor.

RADT 156. Independent Study**1-6 Credits (1-6)**

Individual studies/research on topics related to the radiological sciences. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.

RADT 190. CT Equipment and Methodology**3 Credits (3)**

Skill development in the operation of computed tomographic equipment, focusing on routine protocols, image quality, and quality assurance and radiation protection. Restricted to CTOM (Certificate) and/or RADT Majors. Restricted to Community College Campuses only. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate acquisition of comprehensive technical knowledge by obtaining a seventy-five percent or greater on all quizzes and exam assessments (this is in alignment with the scoring expectations for the national registry exam).
2. Manipulate and choose the appropriate scan parameters and technical factors on CT equipment while applying the technical science supporting the decision.
3. Demonstrate appropriate use of post-processing options and provide diagnostic quality images.
4. Abide by radiation safety and dosimetry standards for patient care by demonstrating ALARA standards.
5. Select CT scan manipulations for optimal demonstration of anatomic region, according to protocol (i.e. delayed imaging, multiplanar reconstructions, filters, etc.) and with safe use of iodinated contrast mediums.
6. Recognize and reduce factors that may inhibit diagnostic image quality.

RADT 191. Computed Tomography (CT) Imaging and Equipment**4 Credits (4)**

This course serves as an introduction to computed tomography (CT) for current radiologic technology students. Course will include information on clinical equipment and application of x-rays in CT, CT image formation, evaluation, and archiving, patient radiation safety and dose, and patient interactions and management for imaging. Restricted to CTOM (Certificate) and/or RADT Majors. Restricted to Dona Ana Campus only.

Learning Outcomes

1. Demonstrate acquisition of comprehensive technical knowledge by obtaining a seventy-five percent or greater on all quizzes and exam assessments (this is in alignment with the scoring expectations for the national registry exam).
2. Identify critical components of CT system equipment and what their purposes are in creating a CT image.
3. Identify CT parameters which allow for safely administering radiation dose; particularly to pediatric patients.
4. List and define the steps required to acquire a CT image, including the theory behind x-ray interaction/absorption/attenuation, detector capabilities, appropriate reconstruction options, and computer equipment.
5. Identify image display functions and radiology informatic options.
6. Identify the major technical components of image display in CT and common artifacts, including how to reduce artifacts.

RADT 200. Radiation Biology and Protection**2 Credits (2)**

Biological effects of ionizing radiation on cells and tissues. Includes radiation measurements, policies and protection measures for self, patients, and others. Restricted to majors. Restricted to: Community Colleges only.

Prerequisite(s): RADT 103.

RADT 201. Clinical Practicum I**4 Credits (32P)**

Supervised practice in a radiology department under direct supervision of a registered technician. Includes film critiques.

Prerequisite: RADT 105.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.
8. Students will identify various opportunities for professional growth within medical imaging sciences.

RADT 202. Clinical Practicum II**6-11 Credits (32P)**

Continuation of RADT 201. Student will work under indirect supervision of registered personnel.

Prerequisite: RADT 201.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.
8. Students will identify various opportunities for professional growth within medical imaging sciences.

RADT 203. Clinical Practicum III**3-11 Credits (32-33P)**

Continuation of RADT 202: Student will work under indirect supervision of registered personnel.

Prerequisite: RADT 202.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.
8. Students will identify various opportunities for professional growth within medical imaging sciences.

RADT 205. Radiographic Image Critique**1-2 Credits (1-2)**

Review of radiographs produced in clinical settings to evaluate anatomy and technical issues. Restricted to RADT majors.

Prerequisite: RADT 201.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 206. Applied Radiographic Procedures**2-3 Credits (2-3)**

Capstone course : Advanced course which integrates the principles and techniques of radiologic technology. Restricted to RADT Majors. May be repeated up to 2 credits.

Prerequisite: RADT 202.

Learning Outcomes

1. Students will demonstrate the ability to safely produce quality diagnostic radiographic images.
2. Students will be able to appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Students will demonstrate effective communication skills.
4. Students will accurately document/record data in accordance with clinical site policies and procedures.
5. Students will demonstrate the ability to use independent judgement.
6. Students will analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Students will conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 207. Cross Sectional Anatomy for Medical Imaging**3 Credits (3)**

Anatomic relationships that are present under various sectional orientations as depicted by computed tomography or magnetic resonance imaging. Restricted to CTOM (Certificate) and/or RADT Majors. Restricted to Community College Campuses only. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize course format and expectations by achieving at least a ninety-percent each on the Syllabus Quiz, Netiquette and Introductory Discussions.
2. Identify and label the anatomy associated with the topical outline in diagnostic CT images.
3. Critique CT images for the presence or absence of anatomy and pathology in deciding whether the image is appropriately positioned and diagnostic for radiologist assessment.
4. Locate anatomical systems and possible pathology based on background knowledge of typical anatomical locations and identify normal course of system function for appropriate positioning, patient instructions, and CT imaging.
5. Apply knowledge in testing environment mimicking that which is expected for the ARRT Registry.

RADT 208. Practicum I (Computed Tomography)**2 Credits (8P)**

A health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. Restricted to Restricted to CTOM (Certificate) and/or RADT Majors. Restricted to Community College Campuses only.

Learning Outcomes

1. Navigate this Canvas course and demonstrate understanding of clinic and course expectations by attending live Orientation and completing the Syllabus Quiz with at least a ninety percent. (CO-one)
2. Communicate effectively with patients to successfully perform CT procedures. (CO-two): Examples of communication include: gathering patient history and any known allergies, screening for pre-existing conditions such as diabetes, gaining an understanding the location of the patient's pain (if applicable) and what may be the cause of it (i.e. trauma, strain, family history, etc.), and ensuring the patient's exam is warranted and is not a duplicate).
3. Properly prepare patients for the type of exam they are scheduled for. (CO-three)
4. Demonstrate competence in intravenous procedures. (CO-four). Competence includes: checking blood for kidney function and understanding normal vs. out-of-range lab values, safely and cleanly starting an IV, choosing the correct type and amount of contrast media, choosing the correct method of injection (either by hand or at a controlled pace via a bolus injector), monitoring the patient during and after the IV injection, and responding to any reactions.
5. Recognize iodinated contrast composition, risks, and proper use (including bolus timing) according to type of CT procedure. (CO-five)
6. Follow radiation safety and dosimetry standards for patient care. (CO-six)
7. Select appropriate CT protocols for respective patient exams. (CO-seven)
8. Exhibit competence in CT physics and instrumentation through safe CT scanner operation. (CO-eight)
9. Perform complete, diagnostic quality CT imaging procedures. (CO-nine)

RADT 209. Practicum II (Computed Tomography)**2 Credits (8P)**

A health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. (Capstone Course). Restricted to Restricted to CTOM (Certificate) and/or RADT Majors. Restricted to Community College Campuses only.

Learning Outcomes

1. To qualify as a complete, diagnostic quality CT imaging procedure the candidate must demonstrate appropriate: Evaluation of requisition and/or medical record; Preparation of examination room; Identification of patient; Patient assessment and education concerning the procedure; Documentation of patient history including allergies; Patient position; Protocol selection; Parameter selection; Image display, filming and archiving; Documentation of procedure, treatment and patient data in appropriate record; Patient discharge with post-procedure instructions; Standard precautions /radiation protection; Preparation and/or administration of contrast media; Initiate scan and evaluate the resulting images for: Image quality (e.g., motion, artifacts, noise); Optimal demonstration of anatomic region (e.g, delayed imaging, reconstruction spacing, algorithm, slice thickness); Exam completeness

RADT 210. Practicum III (Computed Tomography)**2 Credits (8P)**

Continuation of RADT 209: Advanced health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. Upon completion, students will be able to assume most of the duties of an experienced imaging professional in Computed Tomography.

Prerequisite: RADT 209.

Learning Outcomes

1. To qualify as a complete, diagnostic quality CT imaging procedure the candidate must demonstrate appropriate: Evaluation of requisition and/or medical record; Preparation of examination room; Identification of patient; Patient assessment and education concerning the procedure; Documentation of patient history including allergies; Patient position; Protocol selection; Parameter selection; Image display, filming and archiving; Documentation of procedure, treatment and patient data in appropriate record; Patient discharge with post-procedure instructions; Standard precautions /radiation protection; Preparation and/or administration of contrast media; Initiate scan and evaluate the resulting images for: Image quality (e.g., motion, artifacts, noise); Optimal demonstration of anatomic region (e.g. delayed imaging, reconstruction spacing, algorithm, slice thickness); Exam completeness

READ-READING

READ 3110. Instruction for Special Reading Needs**3 Credits (3)**

Emphasizes appropriate techniques for teaching reading to learners with special needs. Restricted to: TEP, EED, ECED, SED, and SPED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate basic knowledge of the five domains of reading;
2. Students will demonstrate knowledge of characteristics of reading disabilities (including dyslexia) and the cognitive and linguistic difficulties that may underlie these disabilities;
3. Students will recognize the cultural, environmental and social factors that can impact reading success;
4. Students will explore instructional practices in phonological awareness, phonics, spelling, vocabulary and comprehension that are consistent with current scientific research findings;
5. Students will use or analyze informal and/or criterion-based assessments for determining students' skills in phonological awareness, word identification, and reading fluency and for determining appropriate instructional goals for students;
6. Students will be able to develop a Professional Learning Community by researching and sharing the effectiveness of various strategies/methods/commercial programs for different domains of reading.

READ 3996. Special Topics**1-3 Credits (1-3)**

Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic.

READ 4310. Elementary School Literacy I**3 Credits (2+2P)**

Reading development, curriculum, and instruction in the elementary grades. Required of all elementary education majors. Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading;
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework;
3. Provide and use anti-bias literacy materials and experiences, including primary language materials;
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer;
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning;
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society;
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 4320. Elementary School Literacy II**3 Credits (2+2P)**

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K 8). Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Prerequisite: READ 4310.

Learning Outcomes

1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process, and the role of literacy in schools and our society;
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so that they reflect an appreciation for child-centeredness and cultural diversity in learning;
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment;
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding;
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 4330. Content Area Literacy**3 Credits (2+2P)**

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Taught with READ 5330. Restricted to: TEP-SED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 5210. Language and Literacy Acquisition**3 Credits (3)**

Framework and strategies of language and literacy acquisition with attention to bilingual learners and the interrelationship among reading, writing, and oral language. May be repeated up to 3 credits.

READ 5220. Sociopsycholinguistics of Reading**3 Credits (3)**

Examines current research on reading process, learning to read, and teaching children to read and evaluates current programs and materials. May be repeated up to 3 credits.

READ 5310. Elementary School Literacy I**3 Credits (2+2P)**

Reading development, curriculum, and instruction in the elementary grades. Same as READ 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810, EDUC 5310, and EDUC 5320.

Learning Outcomes

1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading;
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework;
3. Provide and use anti-bias literacy materials and experiences, including primary language materials;
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer;
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning;
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society;
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 5320. Elementary School Literacy II**3 Credits (2+2P)**

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). Same as READ 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: READ 5310.

Corequisite: EDUC 5330.

Learning Outcomes

1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process, and the role of literacy in schools and our society;
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so that they reflect an appreciation for child-centeredness and cultural diversity in learning;
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment;
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding;
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 5330. Content Area Literacy**3 Credits (3)**

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. "Master' plus Secondary Licensure students Only" and "TEP admission required" May be repeated up to 3 credits.

Prerequisite: SPED 5105, EDUC 5120, EDUC 5110.

Learning Outcomes

1. Define the purpose of schooling begin to articulate the implications for the teacher, youth, teaching, and learning.
2. Explore the historical dimensions of reading instruction in secondary education.
3. Explore the quality and character of life in schools along with the implications for all stakeholders.
4. Explore the roles of reading, writing, listening, and speaking in the content areas.
5. Discuss general pedagogical considerations that extend across all subject matter.
6. Promote the concept that learning in all areas is more authentic and meaningful when knowledge of diverse youth and their communities, content, and pedagogy are valued.
7. Practice strategies that integrate literacy, content, and knowledge of youth.
8. Explore literature in the content area.
9. Develop lesson plans that combine reading, writing, listening, and speaking in the content area that support diversity, integrate technology, and promote effective communication 1
10. Examine the needs of struggling readers. 1
11. Examine the Common Core Standards. 1
12. Engage in research and writing that supports the development of your professional identity as an educator and graduate-level student.

READ 5340. Literacy Assessment and Evaluation**3 Credits (3)**

Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5350. Adult and Family Literacy**3 Credits (3)**

Principles, practices, and instructional materials for adult and family literacy. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and implement various strategies for engaging students and their families through literacy practices in a variety of classroom and home settings.

READ 5360. Digital Literacies**3 Credits (3)**

Digital Literacies study focuses on the multiple relationships between how we express ourselves to one another and the multiple technological systems and networks that provide context, meaning, and shape to those expressions in both social and academic spaces. This course is designed to examine new literacies theory as it applies to teaching applications and current research on digital literacies within K-12 education. As 21st Century practitioner scholars, we are concerned with both the social aspects of literacy practices, understanding that school-based operations are inseparable from the sociocultural contexts in which they are enacted. Must be an NMSU graduate student to participate in this course.

Prerequisite: READ 5340 with a B- or better.

Learning Outcomes

1. Critically assess K-12 implementation of digital literacies across content area curriculum and instruction.
2. Examine seminal and current research on digital literacies' theory, pedagogy, and practice.
3. Determine the level of cultural relevance in schools and pedagogies for 21st Century students.
4. Interpret how social categories relevant to digital literacy contribute to construction of identity.
5. Develop a critical digital pedagogy that addresses the literacy practices of all learners.

READ 5410. Theory and Pedagogy of Literature for Children and Adolescents**3 Credits (3)**

This course provides an in-depth exploration of pedagogy and theory related to literature for adolescents. Students must be in Graduate Standing. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 5420. Theory and Pedagogy of Writing**3 Credits (3)**

This course is designed to examine critical writing theory and pedagogy for K-12 teaching and learning, including inclusive and multicultural approaches, with an emphasis in constructive, collaborative practices, and the integration of digital tools across several genres of writing. Through sequential, thematic units, coursework will emphasize: 1) the study of formative theories along with the development of instructional practices to promote achievement and equity in writing education; 2) the application of these skills through pedagogy and curriculum building, and 3) the construction of broad understandings of craft within the context of the current policies and standards which impact education both regionally and nationally.

Learning Outcomes

1. Critically assess writing curriculum and instruction in K-12 learning environments.
2. Develop a critical writing pedagogy that addresses the literacy practices of all learners.
3. Measure the alignment of writing structures in schools with students' cultural literacies.
4. Interpret how social categories relevant to education contribute to construction of identity.
5. Formulate engaging strategies that develop writers who are competent in multiple genres.

READ 5990. Practicum in Literacy Education**1-6 Credits (1-6)**

Supervised laboratory experience with children with reading difficulties. The student implements a program of specific procedures to aid the disabled reader. May be repeated up to 6 credits.

Prerequisite: READ 5340.

Learning Outcomes

1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5992. Special Studies in Literacy**1-6 Credits (1-6)**

Each study will be designated by a qualifying subtitle. Taught with READ 6992. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in a specific literacy topic.

READ 5996. Selected Topics in Literacy**1-6 Credits (1-6)**

Offered under different subtitles in the Schedule of Classes. Taught with READ 6996 with differentiated subjects for doctoral students. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic.

READ 6110. Critical Issues in Literacy Education**3 Credits (3)**

Critical issues from historical to current perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the multiple critical issues central to literacy education from both a historical and contemporary perspective.

READ 6120. Multiple Critical Literacies**3 Credits (3)**

An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels. Same as BLED 6120. May be repeated up to 3 credits.

READ 6130. Multiculturalism, Literature, and Inquiry**3 Credits (3)**

Advanced exploration and examination of critical multicultural language education vis-a-vis children's adolescent, young adult, and adult literature, with an eye toward problematizing assumptions about literacy, articulating issues of social justice and enacting transactive, transformative pedagogy. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the theories and approaches necessary for conducting inquiry reading and writing.

READ 6210. Ethnography of Reading and Writing**3 Credits (3)**

Covers the dynamics of data interpretation and critical analysis in the study of literacy. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the theories and approaches necessary for conducting ethnographic studies in reading and writing.

READ 6320. Praxis and Reflexivity**3 Credits (3)**

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, EDUC 6220. May be repeated up to 3 credits.

READ 6991. Doctoral Research in Literacy**1-15 Credits (1-15)**

Research on topic of interest. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6992. Special Studies in Literacy**1-6 Credits (1-6)**

Offered under different subtitles in the Schedule of Classes. Taught with READ 5992 with differentiated assignments for doctoral students. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6996. Selected Topics in Literacy**1-6 Credits (1-6)**

Offered under various subtitles that indicate the subject matter. Same as READ 5996. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6997. Independent Study Topics in Reading**1-6 Credits (1-6)**

A problem and seminar course for those pursuing an advanced degree. Each course will have an appropriate subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6999. Research Project**1-15 Credits (1-15)**

Offered primarily for those pursuing the research requirement for the Ed.S. degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

RESP - RESPIRATORY THERAPY

RESP 110. Respiratory Therapy I**3 Credits (3)**

Introduction to basic respiratory care techniques. Includes history, professional organizations, medical gas administration, oxygen therapy, cardiopulmonary AP, patient assessments, and medical terminology. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 110 L. Respiratory Therapy I Lab**2 Credits (2)**

Laboratory practice of basic respiratory care procedures. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 115. Respiratory Therapy Pharmacology**3 Credits (3)**

Concepts of physics as they apply to the physiology of the lungs. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 120. Respiratory Therapy II**4 Credits (4)**

Advanced respiratory care techniques. Emphasis on airway management, aerosol treatment, chest physiotherapy, pharmacology, posture pressure breathing, and pulmonary rehabilitation. Requires a C or better to remain in program. May be repeated up to 4 credits. Students must be admitted into program to enroll in this course. Restricted to Community Colleges campuses only.

Prerequisite(s): RESP 110.

Corequisite(s): RESP 120 L.

RESP 120 L. Respiratory Therapy II Lab**2 Credits (6P)**

Continuation of lab practices and procedures learned in RESP 120, Respiratory Care II, using equipment and simulations. Requires a C or better to remain in program. Students must be admitted to the program to enroll in this course. **Corequisite(s):** RESP 120. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 110, RESP 110L and RESP 112.

RESP 124. Respiratory Therapy II Clinical**3 Credits (9P)**

Supervised practice and application in a hospital setting. Requires a C or better to remain in program. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 110, RESP 110L and RESP 112.

Corequisite(s): RESP 120 and RESP 120L.

RESP 155. Respiratory Therapy Special Topics**1-4 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 10 credits. Consent of instructor required. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): Admission to program.

RESP 210. Respiratory Therapy III**2 Credits (2)**

Introduction to adult, mechanical, neonatal ventilator theory and concepts of critical care medicine. Requires a C or better to remain in program. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 115, RESP 120, RESP 120L, and RESP 124.

Corequisite(s): RESP 210L.

RESP 210 L. Respiratory Therapy III Lab**2 Credits (2)**

Advanced practice procedures using mechanical ventilation devices. Requires a C or better to remain in program. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 115, RESP 120, RESP 120 L, and RESP 124.

Corequisite(s): RESP 210.

RESP 224. Respiratory Therapy IV Clinical**3 Credits (9P)**

Continuation of RESP 124. Emphasis on mechanical ventilators. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): Admission to program, and RESP 115, RESP 120, RESP 120 L, and RESP 124.

RESP 230. Respiratory Therapy V**3 Credits (3)**

Continuation of RESP 215. Emphasis on special modalities. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 230 L. Respiratory Therapy V Lab**2 Credits (2)**

Advanced practice and procedures of respiratory care. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 233. Respiratory Therapy Cardiopulmonary**2 Credits (2)**

Concepts of physics as they apply to the physiology of the lung. Emphasis on laws pertaining to gas flow, humidity, and the mechanics of the breathing process. Requires a C or better to remain in program. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 234. Respiratory Therapy V Clinical**3 Credits (3)**

Continuation of RESP 214. Emphasis on special modalities. Restricted to: Community Colleges only. Restricted to DA-RESP-AA majors.

RESP 240. Respiratory Therapy VI**3 Credits (3)**

Advanced theory of hemodynamics, neonate, pediatric, and new specialties that apply to respiratory care. Requires a C or better to remain in program. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 230, RESP 230L, RESP 233 and RESP 234.

Corequisite(s): RESP 240L.

RESP 240 L. Respiratory Therapy VI Lab**2 Credits (6P)**

Advanced laboratory practice and procedures. Requires a C or better to remain in program. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 230, RESP 230L, RESP 233 and RESP 234.

Corequisite(s): RESP 240.

RESP 242. Pediatric Advanced Life Support (PALS)**1 Credit (1)**

Etiology, diagnosis, clinical manifestations, and management of cardiopulmonary disorders related to respiratory care. Restricted to majors.

Corequisite(s): RESP 230.

RESP 243. Respiratory Therapy Neonatal Resuscitation**1 Credit (1)**

Advanced practice of the neonatal resuscitation and certification. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 230, RESP 230L, RESP 233, and RESP 234.

Corequisite(s): RESP 240 and RESP 244.

RESP 244. Respiratory Therapy VI Clinical**3 Credits (9P)**

Clinical experience on special modalities. Requires a C or better to remain in program. Students must be admitted into program to enroll in this course. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): RESP 230, RESP 230L, RESP 233 and RESP 234.

Corequisite(s): RESP 240.

RESP 255. Respiratory Therapy Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 4 credits. Consent of instructor required. Restricted to: Community Colleges only. Restricted to RESP majors.

Prerequisite(s): Admission to program.

RGSC-RANGE SCIENCE

RGSC 1110. The Range Science Profession**1 Credit (1)**

Introduction to scientific disciplines and career opportunities in rangeland science and management.

Learning Outcomes

1. To introduce students to the Range Science program and to a variety of career opportunities in Range Science.
2. To develop an individualized course curriculum that prepares the student to achieve their career goals.
3. To examine opportunities to gain practical work experience through internships and cooperative employment.

RGSC 2110. Introduction to Rangeland Management**3 Credits (3)**

This course covers the principles of managing and understanding pasture and rangelands. Plant physiology and ecology, plant communities and rangeland sustainability and how they relate to livestock production and wildlife management will be discussed. Restricted to: Main campus only.

Learning Outcomes

1. Understand rangeland management operations.
2. Identify rangeland plants.
3. Gain a perspective of watershed management.
4. Discuss the management of rangeland resources.
5. Understand the process of rangeland evaluation through a broad understanding of monitoring and production of these rangelands.
6. Gain a perspective of the correlation of rangelands and the economic principles guiding resource management.
7. Understand the process of rangeland condition.
8. Understand the concepts of stocking rates and usage of rangelands.
9. Gain a broad perspective of different classes of land ownership; Tribal, federal, private and state. 1
10. Recognize vegetative communities, ecological sites, plant physiology and application to rangeland management considerations.

RGSC 2996. Special Topics**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes.

Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

RGSC 302V. Forestry and Society**3 Credits (3)**

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.

RGSC 316. Rangeland Plants**3 Credits (2+3P)**

Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants.

RGSC 317. Rangeland Communities**3 Credits (3)**

Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

RGSC 318. Watershed Management**3 Credits (2+2P)**

Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality.

RGSC 325. Rangeland Restoration Ecology**3 Credits (3)**

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.

Prerequisite(s): Sophomore standing or consent of instructor.

RGSC 350. Special Topics**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

RGSC 357. Grass Taxonomy and Identification**3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Students must be Junior standing to enroll in this course.

RGSC 390. Internship**1-3 Credits**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.

Prerequisite(s): consent of instructor.

RGSC 402. Seminar**1 Credit (1)**

A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.

Prerequisite(s): Senior standing.

RGSC 402 H. Range Science Seminar**1 Credit (1)**

Taught with RGSC 402 with additional work.

Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status and senior standing.

RGSC 406. Rangeland Team Competition**1 Credit (1)**

Description and characteristics of range plants. May be repeated for a maximum of 4 credits.

RGSC 440. Rangeland Resource Ecology**3 Credits (3)**

Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.

Prerequisite(s): Senior standing.

RGSC 440 L. Rangeland Resource Ecology Lab**1 Credit (2P)**

Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. Corerequisite(s): RGSC 440.

RGSC 448. Problems**1-4 Credits (1-4)**

Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

RGSC 452. Vegetation Measurements for Rangeland Assessment**4 Credits (2+4P)**

Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results.

Prerequisite(s): RGSC 294 and A ST 311.

RGSC 458. Livestock Behavior, Welfare and Handling**3 Credits (2+3P)**

Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458

Prerequisite(s): RGSC 2110 or ANSC 1120.

RGSC 460. Rangeland and Natural Resource Planning and Management**4 Credits (3+3P)**

Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues.

Prerequisite(s): Senior or graduate student standing.

RGSC 485. Land Cover Analysis for Natural Resources**3 Credits (3)**

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis.

RGSC 509. Approaches to Rangeland Research**3 Credits (3)**

Experimental design and statistical analysis of experimental results.

Prerequisite(s): A ST 505 or consent of instructor.

RGSC 513. Advanced Rangeland Ecology**3 Credits (3)**

Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.

Prerequisite(s): RGSC 440 or equivalent.

RGSC 515. Graduate Seminar**1 Credit (1)**

Current topics. Graded S/U.

RGSC 516. Arid Land Management**3 Credits (3)**

Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.

RGSC 518. Watershed Methods and Management**3 Credits (3)**

Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.

RGSC 520. Arid Land Plant Herbivore Interactions**3 Credits (3)**

Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

RGSC 525. Advanced Rangeland Restoration Ecology**3 Credits (3)**

Theory and application of restoration ecology and the principles and practices of ecological restoration. Course emphasizes problems associated with rangeland degradation and highlights current restoration management actions. May be repeated up to 3 credits.

RGSC 550. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

RGSC 551. Earth Data Retrieval**3 Credits (3)**

This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: WSAM 551.

RGSC 557. Advanced Grass Taxonomy and Identification**3 Credits (1+4P)**

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit.

RGSC 575. Climate Studies, Water and Society**3 Credits (3)**

The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies. Crosslisted with: WSAM 575.

RGSC 585. Land Cover Analysis for Natural Resources**3 Credits (3)**

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: WSAM 585.

RGSC 589. Landscape Hydrology Modeling**3 Credits (3)**

The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools. Consent of Instructor required. Crosslisted with: WSAM 589.

RGSC 590. System Dynamics**3 Credits (3)**

This course takes a system dynamics approach to the study of economics and natural resources management. We will examine some of the example theories such as Solow-Swan model and endogenous growth theories as well as the tragedy of the commons, using system dynamics tools to uncover the feedback and explicitly examine its impact on the dynamic behavior of the system. Through these examples, we will learn how to develop, validate, and use system dynamics models for policy design and analysis. Crosslisted with: WSAM 590.

Learning Outcomes

1. identify common generic structures and behavioral modes in socioeconomic and ecological systems,
2. define important feedback theories that explain the behavioral modes in socioeconomic and ecological systems, and
3. implement the system dynamics method to translate the feedback theories into dynamic simulation models.

RGSC 598. Special Research Program**1-4 Credits**

Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 599. Master's Thesis**15 Credits**

Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 600. Doctoral Research**1-15 Credits**

Research. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 616. Advanced Arid Land Management**3 Credits (3)**

In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

RGSC 620. Advanced Arid Land Plant-Herbivore Interactions**3 Credits (3)**

In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

RGSC 698. Special Research Programs**1-4 Credits (1-4)**

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 700. Doctoral Dissertation**15 Credits**

Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

RXPP-PRESCRIP PRIV PRAC PSYCH

RXPP 6110. Introduction to Psychopharmacology for Psychologists I
3 Credits (3)

This course is an introduction to physiology and an overview of gross and microanatomy, with a focus on gross, micro, and chemical anatomy of the nervous system. By the end of the course, psychologists will have an up-to-date understanding of human psychology, anatomy, and neuroanatomy. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6120. Introduction to Psychopharmacology for Psychologists II
3 Credits (3)

Principles of organic chemistry and human biochemistry necessary for the understanding of psychopharmacology are discussed and related to the major transmitter systems and dynamics of transmission. By the end of the course, students will have an up-to-date understanding of biochemistry on which to base further didactic study in psychopharmacology. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6210. Clinical Psychopharmacology I
3 Credits (3)

This course begins with an introduction to the scope of pharmacology; pharmacoepidemiology, ethical, and legal issues (informed consent, State and Federal regulation of drugs and prescribing, sources of drug information and computer aids) and continues with the principles of pharmacokinetics and pharmacodynamics as they relate to the use of psychotropic medications. It concludes with an introduction to the treatment of anxiety disorders from a biopsychosocial model of care with special emphasis on psychopharmacology for anxiety disorders. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6220. Clinical Psychopharmacology II
3 Credits (3)

This course is a thorough investigation of the diagnosis and treatment of affective disorders from a biopsychosocial model of care. Particular emphasis is given to psychopharmacological treatment of depressive disorders and bipolar disorders. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6230. Clinical Psychopharmacology III
3 Credits (3)

This course is an intensive study of the treatment of psychosis from a biopsychosocial model of care. Special consideration is given to: first, second, and third generation antipsychotic drugs and their pharmacology and clinical uses; neurological and metabolic disorders associated with antipsychotic use; and appropriate use of antipsychotics in children and the elderly. Special attention is then given to child and adolescent psychopharmacology, including drugs used in pregnancy and lactation, teratogenicity, embryotoxicity, developmental disorders, conduct disorders, ADHD, and special considerations in use of approved drugs in children. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to the Clinical Psychopharmacology program. May be repeated up to 3 credits.

Learning Outcomes

1. Delineate the biochemical mechanisms underlying the pharmacological efficacy of the three generations of antipsychotic drugs.
2. Differentiate the effects and side effects of first, second and third generation of antipsychotic drugs.
3. Describe the effects of various antipsychotic drugs on the positive and negative symptoms of schizophrenia; including the neurological projections within the Central Nervous System.
4. Describe the biochemical and physiological basis of adverse reactions with antipsychotic treatments.
5. Select anti-psychotics using evidence based criteria and manage the medical issues that arise from their use.
6. Identify the various signs of side effects to antipsychotic drugs and use the appropriate techniques for assessing their severity including the administration of appropriate rating scales assessing those side effects (e.g. AIMS, BMI)
7. Examine the cost-benefit ratio of psychotropic use for adult, child, adolescent and elderly patients with psychotic disorders.
8. Become familiar with current treatment algorithms for the management of psychotic disorders and their limitations.
9. Learn which anti-psychotics that have FDA approval, as well as those that are used off-label in the treatment of children, adolescents and the elderly.

RXPP 6310. Pathophysiology for Psychologists I
3 Credits (3)

This course is an introduction to human clinical physical assessment, history taking, charting, and laboratory testing and neuroimaging. An important emphasis is in functional neuroanatomy and diagnosis and assessment of neurological disorders; role of different components of human nervous system in health and disease; stroke, seizures, and movement disorders (chorea, athetosis, dystonias, dyskinesias, Parkinsonism, akathisia, iatrogenic neurological disorders). Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6320. Pathophysiology for Psychologists II**1-6 Credits (1-6)**

Physical assessment and pathophysiology of the cardiovascular system is studied in depth: structure and function of the heart and major blood vessels; innervation of the heart and vessels; electrocardiogram; components of blood; lymphatics; and physical assessment of cardiac function. The physical assessment and pathophysiology of eyes, ears, nose, and the immune system are studied in depth; anatomy and physiology of special senses; assessment of cranial nerves and sensory function; immune function and psychoimmunology. The physical examination and pathophysiology of the chest and pulmonary system and its relationship to the cardiac system is also studied. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 6 credits.

RXPP 6330. Pathophysiology for Psychologists III**3 Credits (3)**

This course continues with an in-depth study of the chest and pulmonary system: pulmonary function and assessment; respiratory exchange and respiratory involvement in acid: base regulation, disorders of respiratory function. The physical assessment of pathophysiology of the gastrointestinal system is discussed in depth: digestion, absorption and excretion of drugs and nutrients from the GI system; disorders of GI function; hepatic function; innervation of GI tract; endocrine and exocrine functions of GI system; physical assessment of GI function. The functions and pathophysiology of the male and female reproductive system, endocrine system, and renal system are discussed as they relate to psychopharmacology. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6410. Psychopharmacological Treatment in Special Populations I
3 Credits (3)

The psychopharmacology of several special populations are discussed in detail in this course. Geriatric psychopharmacology includes: geriatric physiology; cardiac, renal, hepatic changes with aging; pharmacokinetics/dynamics in the elderly; cognition enhancers in Alzheimer's and other dementias. Special treatment of personality disorders, eating disorders, the importance of racial, ethnic, and gender differences and culturally sensitive practice is presented with applications. Pain management psychopharmacology is over-viewed, including: pharmacology of opioid and non-opioid analgesics; pain syndromes; acute and chronic pain; headache; pharmacological and non-pharmacological approaches to pain management; pharmacology and actions of abused substances: acute effects, withdrawal, biochemistry of tolerance and dependence, brain central reward pathways. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Use a GFR calculator to assess the renal function of an elderly patient.
2. Select the most appropriate antidepressant medication for an elderly patient considering the patient's current level of renal function.
3. Analyze a patient's medication list and calculate the Beers score for the patients' medication list.
4. Use knowledge gained from analysis of the patient's Beers score to select an appropriate medication for the following conditions: insomnia; psychosis; depression anxiety.
5. List three psychotropic medications that do not require a dose adjustment based on the patient's GFR.
6. Analyze an elderly patient's current medication list using the STOPP/START guidelines.
7. Select the most appropriate medication for a patient experiencing delirium consistent with the STOPP/START guidelines.
8. Calculate an elderly patient's vulnerability score using the VES – thirteen.
9. List three psychotropic medications that are hepatotoxic and should not be used in patients with cirrhosis. 1
10. List the 10 most common medical illnesses in the elderly. 1
11. Calculate the Child-Turcotte-Pugh Score of hepatic function for a patient. 1
12. Review the current availability of empirically validated Decision Support Tools (DST's) for the treatment of Late Life Depression (LLD) and decide whether the use of DST is supported by the evidence. 1
13. Defend a risk/benefit analysis for the use of the following medication classes in the elderly: SGA's; AZD Rx's; hypnotics; mood stabilizers. 1
14. Explain the relationship between outcome and sponsorship in studies of the comparative efficacy of psychotropic medications and psychotherapy in older adults. 1
15. List expected dosage adjustments for benzodiazepines, SSRI's, anticonvulsants, and hypnotics in older adults. 1
16. Select the appropriate medication for each of 5 patients in cases presented during the class.

**RXPP 6420. Psychopharmacological Treatment in Special Populations II
3 Credits (3)**

The pathophysiology and treatment of substance use disorders from a biopsychosocial model is presented. Issues of medical comorbidity are studied: psychopharmacological treatment in the medically compromised patient, including case studies and review of comprehensive treatment models; mental disorders due to a general medical condition and/or adverse drug reactions; and referral practices to specialists. Diagnostic rating scales and psychiatric instruments of use to the prescribing psychologist are presented. The course ends with an integration of psychotherapy and pharmacotherapy, including ethical issues such as the right to refuse treatment, treatment compliance/adherence, risk management, and the role of the medical psychologist in the modern, integrated healthcare system. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

**RXPP 6510. Supervised Experience in Psychopharmacology I
1-3 Credits (1-3)**

In this applied course, students employ their knowledge of psychopharmacology in treatment setting. Students will participate in the treatment of 50 patients for a minimum of 200 hours under the supervision of a physician. Number of credits taken to be determined in consultation with RXPP Training Director. Maximum of 3 credit hours required by degree program. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will complete eighty hours of practicum in a health care setting while supervised by a licensed physician.
2. Students will demonstrate expertise in providing basic vitals, physical assessment, and laboratory interpretation skills they have been taught in class.
3. Students will demonstrate expertise in performing diagnostics (e.g. imagining studies), differential diagnoses, clinical medicine, and instrumentation.

**RXPP 6520. Supervised Experience in Psychopharmacology II
1-3 Credits (1-3)**

Continuation and completion of supervised experience in RXPP 6510. Students will participate in the treatment of 50 additional patients for a minimum of 200 hours under the supervision of a physician. The RXPP 6510/6520 sequence must be completed no sooner than three months and no later than three years from initiation. Number of credit hours taken to be determined in consultation with RXPP Training Director. Maximum of 3 credit hours required by degree program. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be monitoring the psycho-biosocial treatment of 100 patients, for a minimum of 400 hours.
2. Students will demonstrate expertise in combining psychotropic medication along with psychotherapy.
3. Students will demonstrate knowledge and expertise in practicing enhanced patient education; and making psychotropic medication recommendations, management, and/or consulting with, as needed, allied health professionals.

RXPP 6996. Selected Topics**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits.

SIGN-SIGN LANGUAGE

SIGN 1110. American Sign Language I**3 Credits (3)**

American Sign Language I is an introductory level language course in the language of the American Deaf Culture. Content includes ASL vocabulary and conversational skills; linguistic features of ASL; and skills in narrative/storytelling. In-class activities, comprehension and expressive examinations, narrative and storytelling assignments in addition to semester projects are venues for students to demonstrate their learning. In addition, Deaf Culture and Deaf Community issues are addressed. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in basic conversations using ASL, such as introducing oneself, exchanging personnel information, and talking about one's surroundings.
2. Demonstrate the use of grammatical structures, including spatial referencing, use of classifiers, role shifting, ASL syntax, and non-manual signals (NMS).
3. Demonstrate clear sign production using an understanding of sign parameters: handshapes, movement, location, palm orientation, and NMS in targeted lexicon.
4. Demonstrate the use of basic ASL vocabulary and expressions necessary for conversations about real-life situations.
5. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
6. Develop culturally-appropriate behaviors and conversation strategies within a variety of contexts for interacting with people who are Deaf.
7. Demonstrate effective use of comprehension and expressive ASL skills through narrative and/or storytelling activities.
8. Describe issues of the American Deaf community and Culture.

SIGN 1120. American Sign Language II**3 Credits (3)**

American Sign Language II is a continuation course that builds on concepts and skills developed in American Sign Language I. Students gain further exposure to ASL structure and grammar, and Deaf Culture and the Deaf community. Emphasis is on increasing students' ability to comprehend other signers and express themselves with more elaboration when conversing or presenting in ASL. May be repeated up to 3 credits.

Prerequisite: SIGN 1110 or consent of instructor.

Learning Outcomes

1. Further develop basic conversational skills in ASL, taking on more complicated topics.
2. Apply knowledge of ASL grammar, including classifiers, spatial referencing and agreement, role shifting, and non-manual markers.
3. Develop ASL vocabulary, fingerspelling, number, narrative and storytelling skills.
4. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
5. Demonstrate effective use of comprehension and expressive ASL skills through conversation, discussion, narrative and/or storytelling activities.
6. Demonstrate knowledge and appreciation of the American Deaf community and ASL.
7. Through first-hand experience in the American Deaf community and ASL, relate and reflect on perspectives of the community.

SIGN 2110. American Sign Language III**3 Credits (3)**

This is an intermediate level course in American Sign Language (ASL). Expected areas of intermediate skill and knowledge development include: language comprehension and production, conversational use, narratives, ASL language features and further knowledge of and interaction with Deaf culture and the Deaf community. May be repeated up to 3 credits.

Prerequisite: SIGN 1120.

Learning Outcomes

1. Demonstrate intermediate ASL vocabulary, conversation and narrative/storytelling skills.
2. Demonstrate fundamental ASL features including visual/spatial orientation, constructed dialogue and action, spatial referencing, classifiers, non-manual behaviors and syntax/word order.
3. Demonstrate appropriate use of cultural behaviors and conversational strategies.
4. Translate written and spoken English to ASL and vice versa.
5. Self-evaluate and provide feedback to peers concerning ASL usage.
6. Examine the culture of the American Deaf community through engaging in community activities and its language.

SMET-SCIENCE/MATH/ENG/TECH**SMET 101. Introduction to Science, Mathematics, Engineering, and Technology****1 Credit (1)**

An introductory course for science, mathematics, engineering, or technology students, emphasizing introduction to their disciplines. Development of critical thinking and academic success skills for technical disciplines, as well as degree planning for the major.

Learning Outcomes

1. Apply the scientific method of constructing and testing hypotheses.
2. Design and conduct an experiment using Radio Jove.
3. Apply astrobiological knowledge to solve human problems.
4. Develop competence in appropriate scientific laboratory techniques.

SMET 102. Introduction to Engineering Design.**1 Credit (1)**

Fundamental concepts of engineering design developed through analysis of case studies and hands-on design projects.

Learning Outcomes

1. Identify assumptions within a given context and be able to predict outcomes through data analysis.
2. Obtain, interpret and analyze numerical information through the use of appropriate tables, diagrams, and algorithms.
3. Develop competency in conveying astrobiological knowledge through laboratory reports and/or written assignments following proper APA documentation style.
4. Design antenna configurations to increase the frequency of the radio Jove.

SMET 201. Research for Visiting Community College Students**1 Credit (1)**

Research experience for visiting community college students. Consent of instructor required. Restricted to: Main campus only.

SMET 301. Undergraduate Research Assistantship**0.5 Credits (.5)**

Undergraduate research experience in science, technology, engineering, and mathematics. Consent of instructor required. Graded: S/U.

SOCI-SOCIOLOGY

SOCI 1110G. Introduction to Sociology

3 Credits (3)

This course will introduce students to the basic concepts and theories of sociology, as well as to the methods utilized in sociological research. The course will address how sociological concepts and theories can be utilized to analyze and interpret our social world, and how profoundly our society and the groups to which students belong influence them. Students will be given the opportunity to challenge their “taken-for-granted” or “common sense” understandings about society, social institutions, and social issues. Special attention will also be paid to the intimate connections between their personal lives and the larger structural features of social life. In addition, the implications of social inequalities, such as race/ethnicity, gender, and social class will be central to the course's examination of social life in the United States.

Learning Outcomes

1. Define sociological perspectives and the contributions that sociological knowledge can bring to the social sciences.
2. Understand the sociological imagination and explain the relationships between social structures, social forces and individuals.
3. Demonstrate the ability to apply the perspectives of symbolic interactionist theory, conflict theory, and structural-functionalist theory to qualitative and/or quantitative data.
4. Understand and explain intersectionality and the connections between race, class, gender, disability, sexual identity and other forms of structural inequality.

SOCI 2230. Sociology of Sexuality

3 Credits (3)

This course explores all aspects of human sexuality from a sociological perspective. Topics include, but are not limited to, sex work, intimate relationships, sexual response, political movements, power, and the social construction of sexuality. The course also considers how various social statuses such as ethnicity, gender, and social class intersect with sexuality.

Learning Outcomes

1. Identify the central research questions, theories, and methodologies used in the study of human sexuality.
2. Identify and describe biological, cultural, social, and psychological sexual behaviors and response across the lifespan.
3. Identify and describe trends and changes that influence sexual attitudes and values in the U.S. and globally.
4. Describe how sexuality is influenced by contextual factors, such as race/ethnicity, gender, socioeconomic status, disability, and nationality.

SOCI 2240. Sociology of Intimate Relationships and Family

3 Credits (3)

This course provides an overview of contemporary intimate relationships and families from sociological perspectives. We will examine intimate relationships and families as social constructions whose meanings have changed over time and from place to place. This course will aid students in developing a greater understanding of intimate relationships and families as institutions in contemporary U.S. society. Intersections of race, class, gender, sexual orientation, nationality, and other factors within these institutions will be addressed. Community Colleges only.

Learning Outcomes

1. Explain the sociological approaches to researching intimate relationships and families.
2. Describe important sociological research findings concerning intimate relationships and families.
3. Explain how intimate and familial relationships are affected by multiple intersecting inequalities and ongoing events in other social institutions.

SOCI 2261. Issues in Death and Dying

3 Credits (3)

Major personal and social issues related to the process of dying in our culture. Community Colleges only.

Learning Outcomes

1. be able to understand the diversity of the death experience and the various options available in coping with death and bereavement as shown by the student's participation in class discussions and field trips.
2. better understand death and dying as social phenomena as shown by the student's reaction papers.
3. have taken an in-depth look at her or his own death with a researched paper. Comprehension will be shown by the student's grade on the paper.

SOCI 2310G. Contemporary Social Problems

3 Credits (3)

This course studies the nature, scope, and effects of social problems and their solutions. The course will concentrate on sociological perspectives, theories, and key concepts when investigating problems, such as inequality, poverty, racism, alienation, family life, sexuality, gender, urbanization, work, aging, crime, war and terrorism, environmental degradation, and mass media. This course is designed to build students' sociological understanding of how sociological approaches attempt to clarify various issues confronting contemporary life, as well as how sociologists view solutions to these problems.

Learning Outcomes

1. Identify and explain major social problems in the United States, and how social problems become constructed as problems.
2. Describe and analyze policy related solutions associated with social problems from various perspectives.
3. Critically examine social problems through the use of sociological theories, methods, and empirical techniques.
4. Identify connections, both national and global, between social problems and social inequalities (e.g., social class, race/ethnicity, and gender/sexuality).

SOCI 3110V. Sociology of Religion**3 Credits (3)**

Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. May be repeated up to 3 credits.

SOCI 3120V. Introduction to Population Studies**3 Credits (3)**

Determinants and consequences of changes in fertility, mortality and migration patterns. Introduction to techniques of demographic analysis. Focus on U.S. and world population issues and their relation to social, cultural, and economic systems. May be repeated up to 3 credits.

SOCI 3150. Social Research: Methods**3 Credits (3)**

An introduction to research design and data collection strategies commonly employed in the social sciences. Topics include experiments, survey research and various other quantitative and qualitative methods. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 3160. Sociological Research: Analysis**3 Credits (3)**

Elementary data analysis class emphasizing descriptive and inferential statistical techniques commonly employed in the social sciences. Topics range from one variable analysis through regression and correlation analysis of two variables. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

Learning Outcomes

1. Critically evaluate understand social statistics from various common sources such as TV, newspapers, research reports, and scholarly articles. –Assessed via discussion, assignments and exams.

SOCI 3165. Sociological Theory**3 Credits (3)**

Analysis of the main historical themes underlying contemporary sociological theory. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 3240. Sociology of the Family**3 Credits (3)**

Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity. May be repeated up to 3 credits.

Learning Outcomes

1. Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity.

SOCI 3245V. Comparative Family Systems**3 Credits (3)**

A comparative analysis of family forms and characteristics in various societies. An examination of the diversity of family practices among ethnic and class groups in the United States. May be repeated up to 3 credits.

SOCI 3250. Sociology of Childhood**3 Credits (3)**

This course examines theories, methods, and empirical research in several areas of the sociology of childhood. Major themes are: (1) how social structure constrains children's lives, (2) how children negotiate, share, and create culture, and (3) how children's experiences vary within and across societies. May be repeated up to 3 credits.

SOCI 3255. Youth and Society**3 Credits (3)**

Comparative historical analysis of social, economic and cultural forces affecting young people. Emphasis on organizational and institutional effects on the well being of children and young adults. May be repeated up to 3 credits.

SOCI 3270. Gender and Society**3 Credits (3)**

Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives. May be repeated up to 3 credits.

SOCI 3310V. Social Issues in the Rural Americas**3 Credits (3)**

Discussion of the major social issues facing the rural United States and borderland areas. Topics include the social history, governmental policies, water rights, land issues and labor. May be repeated up to 3 credits.

SOCI 3315. Urban Society in a Global World: Problems, Prospects, and Promises**3 Credits (3)**

Identification and analysis of the causes and consequences of social issues in urban environments including poverty, crime, terrorism, urban social policy, suburban flight, disinvestment, and deindustrialization. Special emphasis on global forces affecting global urban environments around the world. May be repeated up to 3 credits.

SOCI 3330. Environmental Sociology**3 Credits (3)**

This course provides a sociological examination of the interconnections of human social organization and the biophysical environment. The goal is to make sense of these complex interconnections between society and the environment—including examination of potential causes and solutions to environmental problems in real world settings. May be repeated up to 3 credits.

SOCI 3340V. Social Change**3 Credits (3)**

Explanations of autonomous and directed social change as occurring at the individual, organizational, societal, and international levels. Case studies from around the world. May be repeated up to 3 credits.

SOCI 3410. Race and Ethnic Relations**3 Credits (3)**

Dynamics of racial prejudice and patterns of racial and ethnic interaction in the United States. May be repeated up to 3 credits.

SOCI 3415. Social Inequality**3 Credits (3)**

Analysis of the social distinctions arising from sex, age, occupation, and ethnicity. Emphasis on indicators of social class and patterns of social mobility. May be repeated up to 3 credits.

SOCI 3510. Crime and Society**3 Credits (3)**

Analysis of crime at the interpersonal, organizational, and social structure levels in society. Exploration of contemporary images of crime in mass media. Examination of connections between race, class, gender, and crime in U.S. society. May be repeated up to 3 credits.

SOCI 3520. Juvenile Delinquency**3 Credits (3)**

Nature, extent, and causes of juvenile delinquency; juvenile justice; modern methods of treatment; programs of prevention. May be repeated up to 3 credits.

SOCI 3610V. Sociology of Pop Culture**3 Credits (3)**

This course will provide students with a sociological look at creation, distribution, and effects of popular culture that have shaped, preserved, and conveyed distorted images of social class, race, gender and history to unwary consumers. May be repeated up to 3 credits.

SOCI 3620V. Sports and Society: A Global Perspective**3 Credits (3)**

A critical examination of sports in a global context, emphasizing the social and cultural factors that shape the world of sports and the consequences of sports for societies. Course examines issues of social inequality, violence, media and corporate influence, religion and sports, and the student-athlete experience. May be repeated up to 3 credits.

SOCI 3630. Culture and Social Life**3 Credits (3)**

What exactly does culture look like, and how precisely does it shape—and is shaped by—social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.

Learning Outcomes

1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to include cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 4150. Networked and Connected**3 Credits (3)**

Introduction to social network analysis in sociology. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties.

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 4155. Textual Analysis of Digital and Social Media**3 Credits (3)**

Introduction to some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects.

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 4160. Visualizing Social Life**3 Credits (3)**

Introduction to how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends.

Learning Outcomes

1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 4240V. Comparative Global Family Systems**3 Credits (3)**

The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today. May be repeated up to 3 credits.

SOCI 4310. Community Development**3 Credits (3)**

This is a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Topics include examining what 'community' means, community development versus economic development, and alternative economic activities. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4315. Public Sociology**3 Credits (3)**

This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.

Learning Outcomes

1. Understand the theoretical foundations and debates within public sociology 2) Understand various ways public sociology can be practiced outside academia

SOCI 4320. Collective Behavior and Social Movements**3 Credits (3)**

An overview and exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.

SOCI 4335V. Advanced Environmental Sociology**3 Credits (3)**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 4337. Human Society and the Environment**3 Credits (3)**

This course explores the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4410. Diversity in Alternative Families**3 Credits (3)**

Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life. May be repeated up to 3 credits.

SOCI 4420. Sociology of Latinos/as in the United States**3 Credits (3)**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women's issues. Recommended preparatory courses: SOCI 1110G, SOCI 3410, or HIST 367. May be repeated up to 3 credits.

SOCI 4430. International Migration**3 Credits (3)**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4450. Power and Politics in America**3 Credits (3)**

This course provides an introduction to the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems and facilitates the understanding of the processes and consequences of power distributions in the United States. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

SOCI 4460. Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as POLS 469. May be repeated up to 3 credits.

SOCI 4510. Social Deviance**3 Credits (3)**

Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control. May be repeated up to 3 credits.

SOCI 4555. Sociology of Education**3 Credits (3)**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 4992. Directed Readings**1-3 Credits (1-3)**

Individual readings or research for either majors or nonmajors. Consent of Instructor required. May be repeated up to 6 credits.

SOCI 4996. Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

SOCI 4998. Internship**1-6 Credits (1-6)**

Supervised participation in an appropriate community setting. Taught with SOCI 5998. May be repeated up to 9 credits.

SOCI 4999. Sociology Senior Seminar**3 Credits (3)**

The main goal of this course is to provide Sociology students the opportunity to integrate the knowledge acquired from the classroom with personal real-world experiences in order to explore how a sociological perspective can be applied to one's everyday life and work. Students must be in senior standing to enroll in this course. May be repeated up to 3 credits.

Prerequisite: SOCI 1110G.

Learning Outcomes

1. Refine and demonstrate students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to a real-world setting.
4. Have the opportunity to critically apply and evaluate the utility of select social theories to a real-world setting.
5. Refine critical writing and thinking skills through class discussions.

SOCI 5110. Perspectives on Sociology**3 Credits (3)**

Overview of Sociology and development of students' sociological imaginations. Understanding the place of sociology in career development and the application of Sociology and sociological concepts to the real world. May be repeated up to 3 credits.

Learning Outcomes

1. Refine students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to the real world.
4. Explore how students can utilize sociology in achieving their career goals.
5. Refine students' critical writing and thinking skills through class discussions.

SOCI 5150. Advanced Seminar in Social Networks**3 Credits (3)**

Advanced introduction to social network methods. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties. Includes hands-on experience with the R statistical computing environment

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 5153. Seminar in Sociological Research**3 Credits (3)**

Exploration of research methods, issues, and practical application. Restricted to: Sociology Majors May be repeated up to 3 credits.

SOCI 5155. Advanced Seminar in Text Analysis for the Social Sciences**3 Credits (3)**

Advanced exploration into some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects. Includes hands-on experience with the R statistical computing environment.

Learning Outcomes

1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 5157. Seminar in Qualitative Research Methods**3 Credits (3)**

This course provides an in-depth examination of qualitative research methods, including the logic, time, and purpose of using such methods.

Prerequisite: Graduate standing.

SOCI 5158. Advanced Seminar in Visual Methodology**3 Credits (3)**

This course focuses on the potential and the qualities of visual data collection in research and will start with a review of the diversity of research strategies and ethics that incorporate visual data. We will discuss different ways of using visual methods in research alongside epistemological theory of understanding what it means to look at the world. We will use our own experiences of looking and feeling to consider what visual methods can contribute to effective ethnographic research. Students must be graduate students to enroll.

Learning Outcomes

1. Learn the basic fundamentals of visual qualitative inquiry.
2. Learn the concept of ethics and reflexivity in qualitative research.
3. Learn how to design visual qualitative research.
4. Understand the different methods used in visual qualitative research.
5. Select and use appropriate visual qualitative methods to answer research questions.

SOCI 5160. Advanced Seminar in Data Visualization**3 Credits (3)**

Advanced exploration into how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends. Includes hands-on experience with the R statistical computing environment, especially the ggplot2 package.

Learning Outcomes

1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 5163. Issues in Advanced Quantitative Analysis**3 Credits (3)**

Advanced methods of sociological analysis are examined in detail. Restricted to: Sociology majors. May be repeated up to 3 credits.

SOCI 5165. Seminar in Classical Social Theory**3 Credits (3)**

Analysis of classical social thought within the discipline. Restricted to: Sociology majors. May be repeated up to 3 credits.

SOCI 5170. Advanced Individual and Society**3 Credits (3)**

Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict. May be repeated up to 3 credits.

SOCI 5175. Symbolic Interaction**3 Credits (3)**

This seminar will provide you a backdrop on Symbolic Interactionism, focusing on the direct and indirect antecedents of the theory, as well as current research and theoretical development up to the present. May be repeated up to 3 credits.

SOCI 5270. Graduate Seminar in Sex and Gender**3 Credits (3)**

Comprehensive examination of current gender identity and gender stratification issues. May be repeated up to 3 credits.

SOCI 5310. Advanced Seminar in Community Development**3 Credits (3)**

This is in an advanced seminar addressing a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Students must be in a graduate student to enroll. May be repeated up to 3 credits.

SOCI 5315. Public Sociology**3 Credits (3)**

This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.

Learning Outcomes

1. Understand the theoretical foundations and debates within public sociology
2. Understand various ways public sociology can be practiced outside academia

SOCI 5320. Advanced Collective Behavior and Social Movements**3 Credits (3)**

An advanced exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.

SOCI 5335. Seminar Environmental Sociology**3 Credits (3)**

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 5337. Seminar in Human Society and the Environment**3 Credits (3)**

This is an advanced seminar exploring the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.

Prerequisite: Graduate Student Status.

SOCI 5410. Advanced Race and Ethnic Relations**3 Credits (3)**

In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S. May be repeated up to 3 credits.

SOCI 5415. Graduate Social Stratification**3 Credits (3)**

Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender. May be repeated up to 3 credits.

SOCI 5420. Advanced Sociology of Latinos/as in the United States**3 Credits (3)**

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women's issues. May be repeated up to 3 credits.

SOCI 5430. Advanced International Migration**3 Credits (3)**

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. Students must be Graduate students to enroll. May be repeated up to 3 credits.

SOCI 5440. Advanced Sociological Perspectives on the U.S.-Mexico Border**3 Credits (3)**

Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment. May be repeated up to 3 credits.

SOCI 5450. Advanced Seminar in Power and Politics in the United States**3 Credits (3)**

This is an advanced seminar addressing the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems. It facilitates an understanding of the processes and consequences of power distributions in the United States. Students must be Graduate students to enroll. May be repeated up to 3 credits.

SOCI 5460. Advanced Issues in Globalization**3 Credits (3)**

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as POLS 569. May be repeated up to 3 credits.

SOCI 5510. Issues in Social Deviance**3 Credits (3)**

Selected forms of deviant behavior, social issues, and social problems. May be repeated up to 3 credits.

SOCI 5515. Sociology of Organizations**3 Credits (3)**

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment. May be repeated up to 3 credits.

SOCI 5555. Advanced Sociology of Education**3 Credits (3)**

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 5610. Advanced Seminar in Popular Culture**3 Credits (3)**

This course delves into Popular Culture and how Sociologists define and evaluate Popular Culture in the world today. Students will learn about diverse forms of Popular Culture, their meanings, and how social theory is applied to how Popular Culture is commodified and consumed. Students must be a graduate student to enroll.

Learning Outcomes

1. Explain and show an advanced understanding of the relationship of popular to culture.
2. Have an in-depth knowledge of Critical Theory as it applies to the culture industry.
3. Understand the relationship of the individual and social issues to both popular culture and technologically driven cultural changes.
4. Apply critical thinking about the popular culture experienced in your day-to-day existence and its meaning to everyday life.
5. Read empirical and theoretical writings, summarize and expand upon their core ideas.
6. Be able to discuss as well as compare and contrast various issues associated with popular culture.

SOCI 5630. Advanced Seminar in Culture and Social Life**3 Credits (3)**

What exactly does culture look like, and how precisely does it shape—and is shaped by—social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.

Learning Outcomes

1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to included cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 5991. Special Research Problems**1-3 Credits (1-3)**

Individual analytic or experimental investigations. May be repeated up to 6 credits.

SOCI 5996. Graduate Special Topics**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

SOCI 5998. Internship**1-6 Credits (1-6)**

Supervised participation in appropriate occupational setting. Taught with SOCI 4998 with additional work required at the graduate level. May be repeated up to 12 credits.

Learning Outcomes

1. Various

SOCI 5999. Master's Thesis**1-6 Credits (1-6)**

Thesis. Consent of instructor required. Restricted to Sociology majors. May be repeated up to 88 credits.

Learning Outcomes

1. Various

SOIL-SOIL

SOIL 2110. Introduction to Soil Science**3 Credits (3)**

An overview of fundamental concepts in soil science and soils as a natural resource. Students will be introduced to the physical, chemical, and biological properties as it relates to soil management in environmental science, conservation, and agronomy. May be repeated up to 3 credits.

Prerequisite: (CHEM 1120G and MATH 1215 or higher) or CHEM 1215G.

Learning Outcomes

1. Understand and use the technical terminology associated with the use and management of soils.
2. Understand the classification of soils and the processes leading to their formation.
3. Identify key physical, chemical, and biological properties of soils.
4. Explain the impact of land use and management decisions as it relates to soil degradation and environmental problems.

SOIL 2110L. Introduction to Soil Science Laboratory**1 Credit (1)**

Morphological, chemical, physical and biological properties of soil in the laboratory and field.

Corequisite(s): SOIL 2110.

Learning Outcomes

1. Learn techniques for sampling and characterizing soils in the region.
2. Understand how soils are formed and the processes that occur within the soil profile.
3. Gain fundamental knowledge on soil physical, chemical, and biological properties and how each can influence the overall function of a particular soil.
4. Develop critical thinking and analytical skills within laboratory and field settings.
5. Encourage collaboration, inclusiveness and critical thinking.

SOIL 2996. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

SOIL 300. Special Topics**1-4 Credits**

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

SOIL 312. Soil Management and Fertility**3 Credits (3)**

Management, conservation, and fertility of soils; physical conditions affecting growth, nutrition, and plant production.

Prerequisite(s): SOIL 2110.

Corequisite(s): SOIL 312L.

SOIL 312 L. Soil Management and Fertility Lab**1 Credit (1)**

Hands-on experience. Includes field trips, videos, calculations, visiting lecturers and other lab activities as possible.

Prerequisite(s): SOIL 2110.

Corequisite(s): SOIL 312.

SOIL 370. Environmental Soil Science**3 Credits (3)**

Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as ENVS 370.

Prerequisite: SOIL 2110.

SOIL 391. Internship**1-6 Credits (1-6)**

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/ U, Audit).

SOIL 424. Soil Chemistry**3 Credits (3)**

Basic elements of soil chemistry including clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

Prerequisite(s): SOIL 2110L or CHEM 1215G and CHEM 1225G.

SOIL 447. Seminar**1 Credit (1)**

Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and ENVS 447.

SOIL 449. Special Problems**1-3 Credits**

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

SOIL 450. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree. May be repeated up to 9 credits. Consent of Instructor required.

SOIL 456. Irrigation and Drainage**3 Credits (3)**

Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.

SOIL 472. Soil Morphology and Classification**4 Credits (2+2P)**

Same as SOIL 472. Crosslisted with: SOIL 472.

SOIL 476. Soil Microbiology**3 Credits (3)**

Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as BIOL 476.

SOIL 476 L. Soil Microbiology Laboratory**1 Credit (3P)**

Enumeration of soil microorganisms, their activities, and transformations they mediate. May be repeated up to 1 credit.

Corequisite: SOIL 476.

Learning Outcomes

1. Collect, store, and characterize soil samples using appropriate and sterile techniques of soil microbiology.
2. Observe, describe, and recognize major groups of microbial organisms
3. Develop skills in basic microscopy, isolation and culturing of soil microbes
4. Acquire basic DNA-based molecular skills in soil microbiology.
5. Compare and evaluate soil samples from different microhabitats regarding their soil microbiota.
6. Apply the scientific method including the following steps: developing a research question, constructing a testable hypothesis, design a research study to test the hypothesis, perform the experiment and collect data, analyze the results, evaluate the results and support/ reject the hypothesis, and report the results.

SOIL 477. Environmental Soil Physics**3 Credits (3)**

A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.

SOIL 477 L. Environmental Soil Physics Laboratory**1 Credit (1)**

Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity.

Prerequisite(s): SOIL 2110.

SOIL 479. Environmental Soil Chemistry**3 Credits (3)**

Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.

Prerequisite(s): SOIL 2110L or CHEM 1215G and CHEM 1225G.

SOIL 500. Special Topics**1-4 Credits**

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

SOIL 505. Research Orientation**4 Credits (3+2P)**

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, AGRO 505 and ENVS 505.

SOIL 525. Scientific Writing- How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, HORT 525, HORT 625, SOIL 625 and EPWS 525.

SOIL 590. Graduate Seminar**1 Credit (1)**

Current research discussions presented by master level graduate students. Not more than one credit toward the degree. Same as AGRO/HORT 590. Crosslisted with: AGRO 590 and HORT 590.

SOIL 596. Masters Proposal**1 Credit (1)**

Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and HORT 596. Students must be a Master level graduate student to enroll in this course. Restricted to: Masters HORT; Masters PLEN majors.

SOIL 597. University Teaching Experience**1-3 Credits (1-3)**

Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. Crosslisted with: AGRO 597 and HORT 597

SOIL 598. Special Research Programs**1-6 Credits**

Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

SOIL 625. Scientific Writing- How to be a Productive and Effective Writer**1-3 Credits (1-3)**

Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive.

SOWK-SOCIAL WORK

SOWK 2110G. Introduction to Human Services & Social Work**3 Credits (3)**

This course is for students who are interested in social welfare issues and/or are considering entering a social service profession. The course presents an overview of social problems, issues and trends, and the network of social agencies developed to address these concerns. The course examines the influence of personal and professional values and ethics on the helping relationship. The concept of social welfare will be discussed from a social work perspective (with an emphasis on social justice), and students will gain a basic understanding of social work in U.S. society, social work career opportunities, and contemporary issues facing social workers. Approaches relevant to work with individuals, families, groups and communities are presented, with special emphasis on Hispanic and Indigenous populations of New Mexico and the Southwest. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the interactions of social institutions, cultural factors, dimensions of identity, and environment with the human development and behavior of individuals.
2. Demonstrate knowledge of the social work profession's focus on addressing contemporary social issues in the United States.
3. Describe the mission and services provided by social service agencies at the regional, national, and global levels.
4. Demonstrate a basic understanding of the social work profession, its history, career opportunities, and contemporary issues facing social workers in the United States today.
5. Recognize how students' knowledge, skills, and attitudes impact their competence as helping professionals.

SOWK 2111. Women's Issues in Social Work**3 Credits (3)**

Examines gender-specific social problems and their identification and resolution through the use of social agencies and community resources. Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the commonalities among all women, identifying commonalities and differences among oppressed and dominant groups, recognize multiple oppressions, and respect diversity while conducting social work practice through readings, class discussions, and/or written assignments.
2. Identify the various needs of women as individuals, family members and community members through readings, class discussions, and/or written assignments.
3. Demonstrate skills in working effectively with diverse issues involving women with an emphasis on building strengths, interdependence, self-direction, shared power, and cooperation through experiential exercises, written assignments, companion book, and instructor presentations.
4. Demonstrate skills in addressing issues that affect women such as parental issues, relationship problems, physical abuse, sexual abuse, crime, substance abuse, eating disorders, housing concerns, psychological issues and physical abilities written reports.
5. Understand the importance of and demonstrating skills in caring and empathetic connection in the change process through written assignments, experiential activities in the companion book.
6. Understanding the Importance of the Professionals Self-Care through experiential activities and journaling in the companion book.

SOWK 3110. Sociocultural Concepts**3 Credits (3)**

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are examined. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the role culture, gender, sexual orientation, and socio-economic class play in the way people think, feel, and behave.
2. Examine how diverse populations have been oppressed and exploited by dominant groups throughout U.S. history.
3. Analyze the effects of stereotypes, fallacies, and misconceptions about groups that experience oppression such as the LGBTQIA2S + community, the Elderly, People with Disabilities, BIPOC and people from low socio economic backgrounds and other socially marginalized groups.
4. Recognize theoretical models that describe various forms of discrimination, oppression, privilege and power.
5. Be familiar with relevant knowledge regarding the Southwest, border issues, Native American and Latinx/Chicanx/Hispanic content.
6. Recognize and implement anti racist, anti oppressive, and practice decolonization/indigenization and cultural humility in social work practice and social justice.

SOWK 3120. Human Behavior and the Social Environment I**3 Credits (3)**

Major theories of human behavior and the life span from conception to adolescence. May be repeated up to 3 credits.

Learning Outcomes

1. Apply knowledge of and be able to critique the major theories of human behavior and development processes in the social environment.
2. Introduce knowledge and understanding of the influence of environmental systems (groups and communities) and the complex interplay of biological, psychological, social, spiritual, and cultural dimensions for human development and functioning across the life span.
3. Explore and discuss knowledge and appreciation for human diversity (race/ethnicity, culture, gender, physical/mental disabilities, rural/urban differences, sexual orientation and socioeconomic status) and their impact on human development and functioning.
4. Identify and analyze factors and/events that affect ethnic minorities, women, and other vulnerable and/or oppressed populations.
5. Become familiar with current research of human behavior and the social environment as well as principal based ethics and social work values involved.
6. Examine and explore awareness of the ethical dilemmas, controversies and values inherent in work with diverse populations and various social systems and the implications for practice with emphasis on the Southwest.
7. Explore biases and stereotypes that can affect the understanding of human behavior and change in the social environment

SOWK 3130. Human Behavior and the Social Environment II**3 Credits (3)**

Continuation of S WK 3120. Major theories of human behavior and the life span from young adulthood through old age. Restricted to: S WK majors.

May be repeated up to 3 credits.

Prerequisite: SOWK 3120.

SOWK 3140V. Introduction to Social Policy: History**3 Credits (3)**

Historical overview of the economic, political, and cultural impact on social welfare policy, institutions, and professions with international content. May be repeated up to 3 credits.

Learning Outcomes

1. Students will use reflection and self-regulation to manage personal values as they engage in discussion and written reflection around underlying values in social welfare.
2. Students will apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the macro level through written reflection.
3. Students will apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies through self-reflective discussions.
4. Students will apply their understanding of social, economic, and environmental justice to analyze social policy and advocate for just policies.
5. Through policy analysis and review of policy research, students will identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services; assess how social welfare and economic policies impact the delivery of and access to social services, and apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice.

SOWK 3150. Social Work Research**3 Credits (3)**

This undergraduate course is designed to prepare students to be effective consumers of research and to evaluate their own practice. Students will learn to read, critically evaluate and use the research of others to select interventions that are based on evidence of effectiveness. Students will demonstrate the knowledge, values and skills to be critical consumers of research for effective and ethical practice as well as possess the basic skills necessary to evaluate their own social work professional practice. Restricted to Social Work majors. May be repeated up to 3 credits.

Prerequisite: MATH 1350G or STAT 2350G.

SOWK 3210. Social Work Practice Skills**3 Credits (3)**

Introduction to generalist social work practice. Interpersonal skills, values, and ethics required in the helping relationship. Taught in a small-group format. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate and apply knowledge and skills of entry-level generalist social work practice which focus on the interaction between client-systems and the social environment.
2. Demonstrate and apply the integration of social work values and ethics with one's own personal values and apply ethical decision making in practice.
3. Demonstrate and apply worker-client relationship building and maintenance skills which can be applied across client-systems and populations.
4. Demonstrate and apply knowledge and skills of entry-level generalist social work practice with populations that are targeted and most vulnerable
5. Demonstrate and apply knowledge and skills of entry-level generalist social work practice with populations-at-risk including skills for engagement, assessment, intervention, and evaluation.
6. Demonstrate and apply both critical thinking and evidence-based practice skills in entry-level generalist social work practice.
7. Identify and apply methods of evaluating effectiveness in practice skills, assessment, and intervention across client systems.

SOWK 3220. Social Work Practice with Individuals**3 Credits (3)**

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with individual client systems. Restricted to: S WK majors. May be repeated up to 3 credits.

Prerequisite: SOWK 3210.

SOWK 3230. Social Work Practice with Families**3 Credits (3)**

Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with multicultural family systems. May be repeated up to 3 credits.

Prerequisite: SOWK 3210.

Learning Outcomes

1. Students will apply ethical principles in social work and frameworks for ethical decision making to case scenarios involving families.
2. Students will assess their family of origin and its potential impact on their own work with families.
3. Students will model stages of the helping process with diverse families using cultural humility and a transcultural perspective.
4. Students will explain how family identity intersects with social factors to impact family functioning.
5. Students will plan and execute role plays modeling engagement with diverse families that reflect transcultural awareness and cultural humility.
6. Students will integrate discussion of their own experiences in their planning for family engagement.
7. Students will plan and execute role plays modeling assessment with diverse families that reflect transcultural awareness and cultural humility.
8. Students will conduct a family biopsychosocial assessment and treatment plan. Students will conduct a family biopsychosocial assessment and treatment plan. Students will plan and execute role plays modeling practice evaluation.

SOWK 4110. Social Welfare Policy: Legislation**3 Credits (3)**

Policy practice related to the formation of current social welfare policies that promote social and economic justice. Emphasis is on the development and influences of social policy, policy analysis, and the policy change process. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the social policy development and influence process.
2. Apply a framework for the analysis of current and proposed social policy.
3. Identify and discuss current legislation which addresses social and economic justice.
4. Articulate gaps and/or problems in existing social welfare policies and in social welfare programs.
5. Identify strategies which are appropriate to baccalaureate level practice that may influence policymakers on behalf of people in need.

SOWK 4210. Generalist Social Work Practice with Organizations and Communities

3 Credits (3)

This course focuses on generalist social work values, knowledge and skills regarding practice with larger systems. Course content will include theories of community and organizational assessment and intervention. Strategies for advocacy and change, leadership for community and organizational change. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze various macro theories and apply two or more to a particular issue within a local community or organization.
2. Describe the historical context/foundation of macro practice in social work and identify its application in the community.
3. Identify ethical principles related to macro practice.
4. Describe the use of macro level practice in empowering diverse and oppressed populations
5. Describe an evidence-based practice framework for social work intervention with communities and organizations.

SOWK 4220. Generalist Social Work Practice with Groups

3 Credits (3)

Generalist social work practice skills with group client systems focusing on the planned change process and the empowerment of oppressed populations. Restricted to: S WK majors. May be repeated up to 3 credits.

SOWK 4230. Family and Child Welfare Practice

3 Credits (3)

Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning. May be repeated up to 3 credits.

SOWK 4240. Professionalism in the Field of Social Work

3 Credits (3)

Students will use the field experience as the backdrop for assessing their own progress toward entry level generalist social work practice; to integrate coursework and field experience to develop their professional foundation. Restricted to: S WK majors. May be repeated up to 3 credits.

Corequisite: SOWK 4321.

SOWK 4310. Practicum I

3 Credits (3)

Supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.

Corequisite: SOWK 4311.

SOWK 4311. Practicum Seminar I

3 Credits (3)

The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to develop social work competencies. Restricted to: S WK majors.

Corequisite: SOWK 4310.

SOWK 4320. Practicum II

3 Credits (3)

This course is a continuation of a supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.

Corequisite: SOWK 4321.

SOWK 4321. Practicum Seminar II

3 Credits (3)

The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to demonstrate social work competencies. Restricted to: S WK majors. May be repeated up to 3 credits.

Corequisite: SOWK 4320.

SOWK 4510. Family and Child Welfare Policy

3 Credits (3)

This course is designed to provide students with an understanding of the history and evolution of child welfare policies, initiatives and factors that influence advocacy and practices within the child welfare system. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

SOWK 4996. Special Topics

3 Credits (3)

Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Junior or above standing, majors or consent of instructor. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

SOWK 4997. Independent Study

1-6 Credits (1-6)

Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOWK 5110. Sociocultural Concepts and Populations of the Southwest

3 Credits (3)

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are emphasized. May be repeated up to 3 credits.

Learning Outcomes

1. Explain and compare various theoretical and historical perspectives on discrimination, oppression and economic deprivation, as well as theories of human need and social justice as they relate to marginalized populations in the U.S., especially within the U.S. Southwest.
2. Describe the forms and mechanisms of oppression and discrimination, including the extent to which a culture's structures and values, including social, economic, political, and cultural exclusions, may oppress, marginalize, alienate, or create privilege and power.
3. Analyze the impact of discrimination, oppression and disenfranchisement as well as privilege, power, and acclaim on the human experience and formation of identity.
4. Evaluate dimensions of diversity as the intersectionality of multiple factors including but not limited to age, class, color, culture, disability and ability, ethnicity, gender, gender identity and expression, immigration status, marital status, political ideology, race, religion/spirituality, sex, sexual orientation, and tribal sovereign status.
5. Propose strategies designed to eliminate oppressive structural barriers to ensure that social goods, rights, and responsibilities are distributed equitably and that civil, political, environmental, economic, social, and cultural human rights are protected.

SOWK 5120. Social Work Research I**3 Credits (3)**

Introduction to analytical skills used in social work research: problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human participants in research, and application of research knowledge and professional ethics to social work practice. Restricted to: MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the application of research methodologies for conducting both qualitative and quantitative empirical studies.
2. Students will select relevant peer-reviewed journal articles representative of the generalist social work practice model that contribute to their understanding of social work as an evidenced-based practice.
3. Students will analyze the roles that the Belmont Report, Health and Human Services Office for Human Research Protections, and Institutional Review Boards have in the ethical treatment and protection of human subject participants in conducting research.
4. Students will integrate the professional standards of CSWE Competency 4 into the implications section of the article critiques and research proposal assignment.
5. Students will connect their field practicum experiences to identify the role of generalizable results from empirical research applying to their area of practice client population.
6. Students will propose an empirical research study that details the steps necessary to apply for Institutional Review Board approval.

SOWK 5130. Human Behavior and the Social Environment I**3 Credits (3)**

The major theories of human behavior and the life span from conception to adolescence. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Restricted to MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Describe key theories of human behavior in the social environment.
2. Compare stage theories to recognize typical human development
3. Apply theoretical perspectives to explain a range of various human behaviors.
4. Identify key biological, psychological, and spiritual characteristics of a client (and) subsequently apply appropriate intervention strategies.
5. Identify ways one's physical environment may promote and/or deter optimal health/well-being.

SOWK 5140. Human Behavior & the Social Environment II**3 Credits (3)**

The major theories of human behavior from young adulthood to old age. This course will focus on both areas of concern and risk for client systems and on the opportunities and strengths in the social environment. Restricted to: MSW majors.

Prerequisite: SOWK 5130.

Learning Outcomes

1. Describe the biological and psychological elements and impacts of adverse childhood experiences and trauma.
2. Identify typical physical, cognitive, and socioemotional development of infants, children, adolescents, adults and older adults (as well atypical developmental issues for each age/stage).
3. Recognize the sociocultural context of childbearing, child rearing, adolescence, partnership, and aging.
4. Apply knowledge of human development to guide social work assessment and intervention.

SOWK 5150. Social Problems and Social Welfare Policy**3 Credits (3)**

An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to change policies that impact vulnerable populations. May be repeated up to 3 credits.

Learning Outcomes

1. Summarize the history of the social work profession in social welfare policy and the major roles that social workers perform in policy practice.
2. Analyze the values, institutional, political and economic forces that drive social problems and social welfare policy in the U.S.
3. Analyze past, current and future social policies developed to respond to social problems from a lens that considers the historical, social, cultural, economic, organizational, environmental, and global influences on social problems, and the impact on diverse populations of the Southwest.
4. Evaluate how social work values, ethics, and research, impact the development, evaluation, and implementation of social policy.

SOWK 5160. Generalist Social Work Practice I**3 Credits (3)**

This is the first course of a two-course sequence. An introduction to the generalist crosscultural, social work practice perspective with individuals and families, focusing on social work as a profession, social work knowledge base, professional development, relationship building and assessment with individuals and families within a framework of social work values and ethics. Restricted to: MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will apply the NASW Code of Ethics and frameworks for ethical reasoning to ethical dilemmas encountered in social work practice
2. Students will analyze the strengths and limitations of social work at the micro, mezzo, and macro levels.
3. Students will demonstrate client engagement through the process of motivational interviewing
4. Students will apply skills for effective client assessment through interviews and written biopsychosocial-spiritual assessments
5. Students will create effective, measurable client-centered goals and objectives
6. Students will engage in interprofessional collaboration around a current topic
7. Students will apply knowledge of theory and their own positionality to assessment information to formulate a case

SOWK 5170. Generalist Social Work Practice II**3 Credits (3)**

This is the second course of a two-course sequence. A continuation of the generalist crosscultural, social work practice perspective with individuals and families, focusing on goal setting, contracting, implementation, and outcome assessment. The course also applies the generalist practice perspective and methods to larger systems: groups, organizations, and communities and includes relationship building, assessment, goal setting, contracting, implementation and outcome assessment within a framework of social work values and ethics. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5160.

Learning Outcomes

1. Students will analyze strategies for integrating micro, mezzo, and macro approaches to meet client needs
2. Students will select relevant, evidence-based interventions to meet client goals
3. Students will monitor progress and evaluate treatment outcomes using effective measurement tools and strategies
4. Students will demonstrate foundational skills for engagement and intervention with groups and/or families
5. Students will describe the rationale and basic skills for intervention with communities and organizations.
6. Students will propose a project that applies the planned change process at the community level
7. Students will integrate their learning across all nine social work competencies and apply this learning to a given case.

SOWK 5180. Generalist Practicum Experience I**3 Credits (3)**

Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Restricted to: MSW majors.

SOWK 5190. Generalist Practicum Experience II**3 Credits (3)**

Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Restricted to: MSW majors.

Prerequisite: SOWK 5180.

SOWK 5220. Social Work Research II**3 Credits (3)**

Focused on advanced generalist practice research in multicultural settings. Advanced skills to evaluate practice with individuals, families, groups, organizations, and communities in multicultural settings. Needs assessment as well as program and practice evaluation are emphasized. Restricted to: MSW majors.

Prerequisite: SOWK 5120.

Learning Outcomes

1. Demonstrate understanding of qualitative and quantitative analysis methods used in advanced generalist social work practice.
2. Apply qualitative and quantitative analytical methods to evaluate the effectiveness of advanced generalist social work practice, for: a. advanced generalist program evaluation, b advanced generalist needs assessment, and c. evaluation of one's own practice.
3. Develop competencies in critical analysis of empirical literature related to advanced generalist social work practice.
4. Demonstrate sensitivity to ethical, value, and cultural issues in the application of social work research methods.

SOWK 5250. Policy Analysis and Change**3 Credits (3)**

This course will emphasize policy practice focusing on policy analysis and creating and implementing policy change. Restricted to MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5150.

Learning Outcomes

1. Analyze the role of policy advocacy in addressing social problems in accordance with the NASW Code of Ethics.
2. Use a multilevel policy advocacy framework to advocate for policies which promote human rights, social and economic justice, and addresses culturally influenced barriers to services presented by practitioners, organizations, and larger systems for populations of the Southwest.
3. Identify interconnections between micro policy advocacy interventions, mezzo policy advocacy interventions, and macro policy advocacy interventions.
4. Develop a plan for engagement in micro, mezzo and macro policy advocacy for local, state and federal policies that address social problems impacting diverse populations and constituencies of the Southwest.
5. Apply policy advocacy skills across complex social problems across social sectors that includes collaboration with colleagues and clients.

SOWK 5280. Advanced Generalist Practicum Experience I**3 Credits (3)**

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.

Prerequisite: SOWK 5190.

SOWK 5290. Advanced Generalist Practicum Experience II
3 Credits (3)

Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.

Prerequisite: SOWK 5280.

SOWK 5310. Advanced Social Work Mental Health Practice
3 Credits (3)

This course is designed to add to the practice sequence for Masters Level students in Social Work. It addresses social work assessment of major mental health issues across the life span with an emphasis on resiliency and coping skills. Culturally responsive practices are applied to the major issues of mental health. Basic psychopharmacology, neurobiology and the ways in which Social Workers interact with clients to aid education and effective treatment of medical interventions will be a prominent part of this course. Evidence-based practices useful for work in various disorders will be incorporated. Restricted to: MSW majors. May be repeated up to 3 credits.

Learning Outcomes

1. Critically analyze the concepts of mental health and psychopathology
2. Assess social, political, and economic conditions which interfere with mental health, focusing on populations at risk for discrimination and oppression
3. Conduct assessments of mental and emotional functioning using approved models and tools
4. Apply DSM five criteria across a range of ages and cultures
5. Differentiate culturally based behaviors from psychopathology
6. Promote strengths-based approaches to avoid labeling,
7. Recognize connections between psychopharmacological interventions, symptom reduction, and side effects
8. Identify evidence-based practices for work with clients exhibiting a range of mental disorders

SOWK 5320. Advanced Practice with Individuals
3 Credits (3)

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Students will integrate key social work theories for direct practice into work with individuals
2. Students will select, apply and evaluate culturally-relevant interventions for practice with individuals
3. Students will describe and demonstrate the application of key approaches for direct practice with individuals
4. Students will apply skills for clinical case formulation

SOWK 5330. Advanced Practice with Groups
3 Credits (3)

This course will address the knowledge, values and skills needed to work effectively with diverse populations in group settings. The course will build on Foundation Year courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Demonstrate the ability to conduct a group
2. Apply a theoretically informed knowledge base of group development as it is executed across systems
3. Demonstrate knowledge of the variety of roles that group leaders and participants need to address in accomplishing the successful mission of the group
4. Establish a process that encourages clients to embrace the mutual aid function of groups, embracing an attention to multiple helping relationships
5. Advocate for a democratic process within all groups, encouraging a mutual emphasis on empowerment
6. Apply skills for social work assessment to group assessments

SOWK 5340. Advanced Practice with Families
3 Credits (3)

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Describe a range of approaches to and issues in social work practice with families
2. Apply social work assessment and planning skills to work with family systems
3. Critically analyze the role of personal experiences in our perceptions of and work with families
4. Describe key features of core approaches to family therapy and critique their application in models
5. Demonstrate the application of at least one core approach to family therapy
6. Apply considerations for ethical decision making to work with families

**SOWK 5350. Advanced Practice with Organizations and Communities
3 Credits (3)**

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. . Restricted to: MSW majors. May be repeated up to 3 credits.

Prerequisite: SOWK 5170.

Learning Outcomes

1. Identify key theories, history, and ideological influences for macro social work practice.
2. Describe and apply methodology of Root Cause Analysis for a selected community/social issue of concern.
3. Use a range of approaches to assess a community/social issue of concern.
4. Create a community Power Map for the purposes of advocacy and social change.
5. Conduct an Organizational Capacity Assessment.
6. Present a strategic plan for implementing a data-informed initiative.
7. Describe formal methods/techniques for program assessment.

SOWK 5510. Family and Child Welfare Policy**3 Credits (3)**

This course will enhance students' ability to offer child welfare services that respect cultural differences, reflect current policy knowledge concerning child maltreatment, build on the advocacy and protective capacities of individuals, families and communities and encourage permanency for children and preservation of families. Required basic knowledge of child welfare and assessment skills. Outside majors require instructor permission. May be repeated up to 3 credits.

SOWK 5996. Special Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields.

May be repeated up to 99 credits.

Learning Outcomes

1. Varies

SOWK 5997. Independent Study**1-3 Credits (1-3)**

Individual study to augment depth of knowledge in area related to course of study. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOWK 5999. Graduate Thesis**1-6 Credits (1-6)**

Required for thesis option. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPAN-SPANISH

SPAN 1110. Spanish I**4 Credits (4)**

Designed for students with little exposure to Spanish, this course develops basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication at the Novice Level of proficiency based on ACTFL guidelines. During this course, students perform better and stronger in the Novice Mid level while some abilities emerge in the Novice High range. This is an introductory course aimed at helping the student to communicate in Spanish in everyday familiar situations via recognition and production of practiced or memorized words, phrases, and simple sentences.

Prerequisite(s): language placement and/or assessment by departmental examination.

Learning Outcomes

1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can present information about myself and some other very familiar topics using a variety of words, phrases, and memorized expressions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and some-times understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.

SPAN 1120. Spanish II**4 Credits (4)**

Designed for students with some degree of exposure to Spanish in high school and/or at home, this course continues to develop basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication based at the Novice High Level of proficiency based on ACTFL guidelines, although a few abilities may emerge in the Intermediate Low Level.

Students in this course communicate in Spanish in familiar topics using a variety of words, phrases, simple sentences and questions that have been highly practiced and memorized.

Prerequisite: language placement and/or assessment by departmental examination or a C- or better in SPAN 1110.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can present basic information on familiar topics using language they have practiced using phrases and simple sentences.
4. Students can write briefly about most familiar topics and present information using a series of simple sentences.
5. Students can understand the main idea in short, simple messages and presentations on familiar topics.
6. Students can understand the main idea of simple conversations that they overhear.
7. Students can understand the main idea of short and simple texts when the topic is familiar.

SPAN 1210. Elementary Spanish for Heritage Learners I**3 Credits (3)**

This is a beginning-level Spanish course designed for students who have a cultural connection to the Spanish language. Some students have had very little exposure to the language and enter the class to develop beginning-level skills. Other students may have grown up hearing the heritage language in the community and may understand some Spanish and speak at a basic level as a result. The objective is to draw upon the connection to the heritage language as a source of motivation and engagement for our learning communities. At the same time, we build upon the language base that students may already have as a result of their heritage learner experience in order to develop new proficiencies in Spanish and reactivate the Spanish that students have learned previously. By the end of this course, students will be able to describe their home, campus surroundings and common activities including cultural traditions. At the same time, students gain cultural competency and develop a critical understanding of their linguistic and cultural background. Students who have previously earned a C or better in SPAN 1110 or SPAN 1120 may not receive credit for this course.

Learning Outcomes

1. Interpersonal Communication: Students can engage in exchanges in culturally appropriate ways using understandable pronunciation on familiar topics using contextualized words, phrases, common idiomatic expressions, and simple sentences.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language that describes a past/present/future (fictional) event to the reader.
3. Interpretive listening: Students can understand familiar questions and statements from simple sentences in conversations.
4. Interpretive reading: Students can identify the topic and some isolated facts from simple sentences in informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with subsequent courses.

SPAN 1220. Spanish for Heritage Learners II**3 Credits (3)**

Spanish as a Heritage Language II is a second semester class designed for students who have developed some basic Spanish proficiency from previous classes and/or from community experiences. This course provides students with the opportunity to develop their proficiency in the four language skills (speaking, listening, reading, and writing). Class activities are designed to strengthen oral communication skills (speaking and listening) through a variety of group activities. By the end of the course students will be able to understand and produce narrations of past events in oral and written Spanish. In order to foster a desire to revitalize and maintain the Spanish language in the US context we attempt to raise students' critical awareness of what it means to be part of a specific speech community.

Learning Outcomes

1. Interpersonal Communication: Students can engage in basic but authentic conversations through providing and obtaining information, expressing likes and dislikes, describing their daily lives, and narrating simple events in the past.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that describes a past (fictional) event to the reader.
3. Interpretive listening: can identify the main idea in short conversations.
4. Interpretive reading: Students can identify the topic and related information from simple sentences in short informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 2110. Spanish III**3 Credits (3)**

This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.

Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 1120.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can handle short social interactions in everyday situations by asking and answering a variety of questions.
3. Students can usually say what they want to say about themselves and their everyday life.
4. Students can make presentations on a wide variety of familiar topics using connected sentences
5. Students can write on a wide variety of familiar topics using connected sentences.
6. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
7. Students can understand the main idea in conversations that they overhear.
8. Students can understand the main idea of texts related to everyday life and personal interests or studies.

SPAN 2120. Spanish IV**3 Credits (3)**

This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.

Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 2110.

Learning Outcomes

1. Students can participate with ease and confidence in conversations on familiar topics.
2. Students can usually talk about events and experiences in various time frames.
3. Students can usually describe people, places, and things.
4. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
5. Students can make presentations in a generally organized way on school, work, and community topics, and on topics they have researched.
6. Students can make presentations on some events and experiences in various time frames.
7. Students can write on topics related to school, work, and community in a generally organized way.
8. Students can write some simple paragraphs about events and experiences in various time frames.
9. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies. 1
10. Students can usually understand a few details of what they overhear in conversations, even when something unexpected is expressed. 1
11. Students can sometimes follow what they hear about events and experiences in various time frames. 1
12. Students can easily understand the main idea of texts related to everyday life, personal interests, and studies. 1
13. Students can sometimes follow stories and descriptions about events and experiences in various time frames.

SPAN 2210. Spanish for Heritage Learners III**3 Credits (3)**

Intermediate Spanish for Heritage Speakers I is a third semester course designed for students who have been raised in a Spanish-speaking environment and speak, or understand, some Spanish as a result of hearing it in the home, and in the community by family, friends, and neighbors. Students in this course will continue to develop their ability to narrate events in the past and will be able to describe hypothetical situations. Students will also develop their ability to express wishes, desires, and necessities. This course will help the student build confidence in their Spanish abilities and expand the language use in the areas of writing, reading, oral production and listening comprehension. In order to foster a desire to revitalize and maintain the Spanish language we attempt to raise students' critical awareness of wider issues facing Spanish speakers in the US context. May be repeated up to 3 credits.

Learning Outcomes

1. Interpersonal Communication: Students can exchange information on a wide variety of familiar topics in which the students use appropriate vocabulary to describe their daily lives and narrate events in the past with some degree of ease and confidence.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that effectively conveys a series of past (fictional) events to the reader that may include recent and distant past.
3. Interpretive listening: Students can identify the main idea and key information in short straightforward conversations.
4. Interpretive reading: Students can understand the main idea and key information in short straightforward informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 305. Topics in Hispanic Civilization**3 Credits (3)**

Group study of selected topics focusing on Hispanic culture and civilization. Topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 306. Special Topics**3 Credits (3)**

Group study of Spanish for specialized purposes (e.g. court interpreting, professional language for bilingual teachers, technical writing for the business community). Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 316. Grammar for Non-Native Speakers of Spanish
3 Credits (3)

For students who did not grow up speaking Spanish. A review of the rules of Spanish grammar. Students cannot receive credit for both SPAN 316 and SPAN 318.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in Spanish by becoming more adept at using a variety of grammatical structures.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 317. Composition for Non-Native Speakers of Spanish
3 Credits (3)

For students who did not grow up speaking Spanish. Development of professional and academic writing skills in Spanish. Students cannot receive credit for both SPAN 317 and SPAN 319.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanish by employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 318. Grammar for Heritage/Native Speakers of Spanish
3 Credits (3)

For students who speak or have been exposed to Spanish at home or in the community. A review of grammatical concepts and analysis of both spoken and written Spanish. Students cannot receive credit for both SPAN 316 and SPAN 318.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written and spoken Spanish by using a variety of grammatical structures.
3. Students will sharpen their Spanish communication skills, which will assist them in securing employment as bilingual speakers.
4. Students will develop a stronger appreciation for the Spanish communication skills and cultural awareness which will assist them in contributing to their communities in meaningful ways.
5. Students will gain critical thinking skills as they sharpen their bilingual abilities.

SPAN 319. Composition for Heritage/Native Speakers of Spanish
3 Credits (3)

For students who speak or have been exposed to Spanish at home or in the community. Development of writing strategies, styles and techniques in the Spanish language. Students cannot receive credit for both SPAN 317 and SPAN 319.

Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanish by employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 325. Advanced Conversation**3 Credits (3)**

Intensive oral practice. Not open to heritage/native speakers of Spanish.

Prerequisite(s): SPAN 2120 or consent of instructor.

SPAN 327. Spanish in the Community**3 Credits (3)**

Emphasis on use of Spanish outside the classroom in the local communities. Activities include but are not limited to oral histories, language mentoring in schools, assisting with cultural activities and language research.

Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to apply bilingual and bicultural skills to serve the community.

SPAN 330. Variations in Spanish**3 Credits (3)**

The study of social variation within the Spanish language, examining both social and linguistic factors that affect language change.

Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to linguistic variations.
5. Students will learn about variations in the Spanish language and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 340. Introduction to Spanish Linguistics**3 Credits (3)**

General aspects of Spanish linguistics: traditional, descriptive, historical and dialectal.

Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to Spanish linguistics.
5. Students will learn about a wide range of linguistics topics and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 350. Introduction to Chicano Studies**3 Credits (3)**

Covers Mexican-American life including language, history, education, politics and literature.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano Studies.
5. Students will learn about various Chicano cultural and historical themes and how they affect the Chicano community today.

SPAN 361. US-Mexico Border Culture & Literature**3 Credits (3)**

Study of major authors and/or cultural trends in the U.S.-Mexico border. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of border literature and culture.
5. Students will learn about the value of US-Mexico border culture and literature and how they help form unique border communities.

SPAN 364V. Culture and Civilization of Mexico**3 Credits (3)**

Familiarization with culture, civilization and regions of Mexico. History, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Mexican culture and civilization on the Southwest United States. Taught in English. Does not satisfy Arts and Sciences second language requirement.

SPAN 365V. Culture and Civilization of Spanish America**3 Credits (3)**

Familiarization with culture, civilization and regions of Spanish America. Study of history, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Spanish American culture and civilization on the Southwest United States. Taught in English. Does not satisfy College of Arts and Sciences second language requirement.

SPAN 380. Introduction to Hispanic Literature**3 Credits (3)**

Works in Spanish, all genres and periods. How to read literature in all forms.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature.
5. Students will read foundational Hispanic texts of various genres and periods and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 385. Introduction to Chicano/US-Mexican Literature**3 Credits (3)**

Introduction to the study of major works by Chicano/US-Mexican authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres and learn how they create and sustain a national Chicano consciousness.

SPAN 388. Contemporary Hispanic Literature**3 Credits (3)**

Study of Peninsular and Spanish-American literature from the 20th century to the present.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature.
5. Students will read foundational Hispanic texts of various genres from the 20th and 21st centuries and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 393. Introduction to Translation and Interpretation**3 Credits (3)**

General aspects of translation and interpretation from English to Spanish and Spanish to English. Selected subject to be identified by subtitle in the Schedule of Classes.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms, concepts, and strategies related to translation and interpretation.
5. Students will learn how to translate written texts and/or interpret live communication between the Spanish and English languages. However, other languages may be included at instructor's discretion.

SPAN 399. Independent Studies in Literature, Language, or Culture**1-3 Credits**

Individualized, self-paced projects for advanced students. Students must present formal proposal of study.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to connect the value between literature, language, and culture and how to apply this knowledge to serve their community.

SPAN 411. Creative Writing**3 Credits (3)**

Creative writing in Spanish.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of creative writing and the publication process.
5. Students will read and learn about the process and types of creative writing and publication, how to create original texts, and how to edit and publish creating works.

SPAN 412. Spanish-American Poetry**3 Credits (3)**

Study of major works by Spanish-American poets.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the poetry genre.
5. Students will read foundational Hispanic poetry from different periods and learn how poets and poetry create and inform Hispanic histories, identities, and nations.

SPAN 418. Spanish-American Short Story**3 Credits (3)**

Study of major short stories by Spanish-American authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the short story genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 419. Spanish American Drama**3 Credits (3)**

Study of major works by Spanish-American dramatists.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the drama genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 420. The Art of Storytelling**3 Credits (3)**

The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of oral storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 421. New Mexico Culture and Literature**3 Credits (3)**

The study of the development and flourishing of New Mexican culture and literature.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about key cultural, literary, and historical elements of New Mexico.
5. Students will learn how to apply knowledge about New Mexico to serve their communities.

SPAN 422. Cultural Production of Hispanic Revolutions and Wars**3 Credits (3)**

The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form our regional and national identities, especially through a cultural production lens.

SPAN 424. Post-Modern Hispanic Literature**3 Credits (3)**

The study of Post-Modern experimental literary genres, from Post-boom to the present.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of post-modernism, especially in relation to Hispanic literary production.
5. Students will read a variety of post-modern Hispanic texts from various genres and learn how they help develop regional and national identities.

SPAN 426. Spanish-American Novel**3 Credits (3)**

Study of major works by Spanish-American novelists.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the novel genre.
5. Students will read foundational Hispanic novels from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 427. Chicano Literature**3 Credits (3)**

Study of Chicano/US-Mexican authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop advanced comprehension of the terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres, but with a focus on narratives, and learn how they create and sustain a national Chicano consciousness.

SPAN 439. Topics in Applied Spanish Linguistics**3 Credits (3)**

Group study of selected topics to be identified by subtitle in the Schedule of Classes. May be repeated once under different subtitle for a maximum of 6 credits.

Prerequisite: SPAN 340.

SPAN 442. Formation of Hispanic National Identities**3 Credits (3)**

Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 444. Body Studies**3 Credits (3)**

Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 446. Speculative Fiction**3 Credits (3)**

Study of Hispanic speculative fiction and its related utopian/dystopian societies.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 447. Hispanic Film**3 Credits (3)**

Study of major films from Spain and Spanish-America. Restricted to: Main campus only.

SPAN 448. U.S.-Hispanic Film**3 Credits (3)**

Study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 449. Special Problems**1-3 Credits**

Directed reading for graduate students in their specific fields to satisfy language requirement for master's or doctoral programs. May be repeated for a maximum of 6 credits.

SPAN 451. Hispanic Cultures**3 Credits (3)**

Issues in Hispanic cultures of the U.S., Spanish-America and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various modes of Hispanic cultural production and how they create regional and national Hispanic identities.

SPAN 457. Strategies for Teaching Spanish for Heritage/Native Speakers**3 Credits (3)**

Overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers. Taught with SPAN 597.

Prerequisite: SPAN 317 or SPAN 319 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop advanced comprehension of the terms and concepts related to the study and application of Spanish for Heritage/Native Speakers of Spanish.
5. Students will learn how to become more effective teachers of Spanish for Heritage/Native Speakers of Spanish.

SPAN 461. Introduction to Spanish Phonetics**3 Credits (3)**

An introduction to Spanish phonetics including basic dialectal variation and comparison with English.

Prerequisite: SPAN 340.

SPAN 474. Pragmatics**3 Credits (3)**

The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.

Prerequisite(s): SPAN 340.

SPAN 476. Semantics**3 Credits (3)**

The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.

Prerequisite(s): SPAN 340.

SPAN 483. Literature and Law**3 Credits (3)**

The advanced study of Latin American and Latino literature and its historical and cultural connections to the development of laws and the influence of both on modern society.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of legal themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies legal issues that affect the Hispanic community.

SPAN 485. Literature and Mental Health**3 Credits (3)**

The advanced study of Latin American and Latino literature and how storytelling, through various literary genres, can inform our understanding of mental health issues and propose possible solutions to improve our quality of mental health.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of mental health themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies mental health issues that affect the Hispanic community.

SPAN 490. Special Topics**3 Credits (3)**

Selected topic to be identified by subtitle in the Schedule of Classes.

Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various topics of Hispanic literature or linguistics that can be applied to advanced research projects.

SPAN 491. History of the Spanish Language**3 Credits (3)**

The development of Spanish from its origins.

Prerequisite(s): SPAN 340.

SPAN 492. Structure of Spanish**3 Credits (3)**

Topics in Spanish linguistics including phonology, morphology, syntax and semantics.

Prerequisite: SPAN 316 or SPAN 318 or SPAN 340.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to the structure of Spanish.
5. Students will learn about the formation of the structure of Spanish and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 493. Espanol de los Estados Unidos**3 Credits (3)**

Linguistic issues and studies of U.S. Spanish-speaking communities.

Taught with SPAN 593. May be repeated up to 3 credits.

Prerequisite(s): SPAN 340.

SPAN 500. Methods of Research and Literary Criticism**3 Credits (3)**

Advanced methods of research and literary criticism.

SPAN 507. Technology Enhanced Language Learning**3 Credits (3)**

Strategies for enhancing language learning with emerging technologies.

Course is taught in Spanish.

SPAN 508. Teaching Literature with Technology**3 Credits (3)**

Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/

Prerequisite(s): SPAN 507, and/or consent of instructor.

SPAN 509. Teaching Culture with Technology**3 Credits (3)**

Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/

Prerequisite(s): SPAN 507, and/or consent of instructor.

SPAN 510. Assessing the National Standards**3 Credits (3)**

Analysis of the National Standards for Foreign Language Learning (the 5 Cs) in the 21st Century. Course will also cover the Integrated Performance Assessment as applied to the national standards. Other assessments will be reviewed to evaluate effectiveness in all levels of Spanish language classrooms.

SPAN 512. Contemporary Spanish-American Poetry**3 Credits (3)**

Readings and interpretation of Spanish-American poetry from the 20th century to the present.

SPAN 520. Adv. The Art of Storytelling**3 Credits (3)**

The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts of storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 521. Advanced Culture and Literature of New Mexico**3 Credits (3)**

The advanced study of the development and flourishing of New Mexican culture and literature.

**SPAN 522. Adv. Cultural Production of Hispanic Revolutions and Wars
3 Credits (3)**

The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form regional and national identities, especially through a cultural production lens

**SPAN 528. Advanced U.S. Latino Culture and Literature
3 Credits (3)**

The advanced study of major works by Latino writers in the U.S.

**SPAN 540. Introduccion a la Linguistica
3 Credits (3)**

Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change.

Prerequisite(s): Eligibility to take graduate level courses.

**SPAN 542. Adv. Formation of Hispanic National Identities
3 Credits (3)**

Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

**SPAN 544. Adv. Body Studies
3 Credits (3)**

Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

**SPAN 545. Advanced Dialectos del Espanol
3 Credits (3)**

Advanced research of Spanish dialects including their formal characteristics, historical formation and regional variation.

**SPAN 546. Adv. Speculative Fiction
3 Credits (3)**

Study of Hispanic speculative fiction and its related utopian/dystopian societies.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

**SPAN 547. Advanced Hispanic Film
3 Credits (3)**

Advanced study of major films from Spain and Spanish-America. Restricted to: Main campus only.

**SPAN 548. Advanced U.S.-Hispanic Film
3 Credits (3)**

Advanced study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 550. Advanced Chicana and Chicano Studies**3 Credits (3)**

Multidisciplinary examination of issues that have historically affected/influenced the Chicana/o community regionally, in the borderlands, and beyond borders.

Learning Outcomes

1. Students will become better equipped to teach this material at the high school or community college levels.
2. Students will become better equipped to attend a PhD program in a related field.
3. Students will gain access to a more diverse curriculum which broaden their educational and cultural perspectives.
4. Students will be able to develop their scholarship on a more creative level.
5. Students will strengthen their academic writing, which will help in their graduate studies and/or post-graduate careers.

SPAN 551. Advanced Hispanic Cultures**3 Credits (3)**

Advanced study on Hispanic cultures of the U.S., Spanish-America and/or Spain. Selected topic to be identified by subtitle. Taught with SPAN 451. May be repeated up to 6 credits.

SPAN 552. Advanced Literature of the Mexican Revolution**3 Credits (3)**

Study of Mexican authors dealing with the Mexican Revolution. Restricted to: Main campus only.

SPAN 558. Bilinguismo**3 Credits (3)**

Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence.

Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 561. Advanced Spanish Phonetics**3 Credits (3)**

Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.

SPAN 562. Advanced Spanish Phonology**3 Credits (3)**

An advanced formal examination of the sound system of Spanish including formal characterizations, dialectal variation and laboratory data. May be repeated up to 3 credits.

Prerequisite(s): SPAN 561 or consent of instructor.

SPAN 563. Advanced Study in Mexican Literature**3 Credits (3)**

Mexican literature from the Pre-Columbian period to the present.

SPAN 564. Advanced Post-Modern Hispanic Literature**3 Credits (3)**

The advanced study of Post-Modern experimental literary genres, from Post-boom to the present.

SPAN 566. Contemporary Spanish-American Novel**3 Credits (3)**

The Spanish-American novel from the 20th century to the present.

SPAN 567. Advanced Study in Chicano Literature**3 Credits (3)**

Study of all genres of Chicano literature.

SPAN 570. Advanced Study in Technical Translation**3 Credits (3)**

Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.

SPAN 573. Advanced Study in Creative Writing**3 Credits (3)**

Advanced creative writing in Spanish.

SPAN 574. Advanced Pragmatics**3 Credits (3)**

The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.

Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 576. Advanced Semantics**3 Credits (3)**

The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.

Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 580. Research Methodology in Spanish Linguistics**3 Credits (3)**

Study and practical application of techniques in linguistic research.

SPAN 583. Advanced Study in Spanish-American Women Writers**3 Credits (3)**

All genres of Spanish-American literature written by women. Research paper required.

SPAN 584. Spanish Morphosyntax**3 Credits (3)**

Examination of the morphological and syntactic structure of the Spanish language as well as their interaction. Practical applications are also explored.

SPAN 586. Contemporary Spanish-American Essay**3 Credits (3)**

Main currents in the Spanish-American thought from the 20th century to the present.

SPAN 587. Contemporary Spanish-American Short Story**3 Credits (3)**

The Spanish-American short story from the 20th century to the present.

SPAN 588. Contemporary Spanish-American Drama**3 Credits (3)**

The Spanish-American drama from the 20th century to the present.

SPAN 589. Spanish Sociolinguistics**3 Credits (3)**

Relationship between language and society in the Spanish-speaking world.

SPAN 590. Advanced Special Topics**3 Credits (3)**

Specific subject to be announced in the Schedule of Classes. May be repeated up to 6 credits.

SPAN 591. Advanced Study in History of the Spanish Language**3 Credits (3)**

The development of Spanish from its origins.

SPAN 592. Advanced Structure of Spanish**3 Credits (3)**

Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.

SPAN 594. Theory and Methodology of Spanish Pedagogy
3 Credits (3)

Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.

SPAN 595. Advanced Topics in Applied Spanish Linguistics
3 Credits (3)

Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.

SPAN 597. Advanced Strategies for Teaching Spanish for Heritage/Native Speakers
3 Credits (3)

Advanced overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers.

SPAN 598. Independent Reading, Research, and/or Creative Writing
1-3 Credits

Individual study of selected readings and problems; or individual research, either analytical or experimental, or creative writing. May be repeated for unlimited credits.

SPAN 599. Master's Thesis
15 Credits
 Thesis.

SPED-SPECIAL EDUCATION

SPED 2996. Topics
3 Credits (3)

Offered under various subtitles that indicate the subject matter to be covered. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 3105. Introduction to Special Education in a Diverse Society
3 Credits (3)

Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 3110. Bilingual/Multicultural Special Education
3 Credits (3)

Introduction to issues related to the provision of services to culturally and linguistically diverse students with exceptionalities.

Learning Outcomes

1. Students will identify implicit and explicit biases.
2. Students will discuss the cultural characteristics of families from culturally and linguistically diverse backgrounds and the barriers of parent engagement in their child's education.
3. Students will identify how privilege, power, and inequities exist in the school system and how it impacts the academic achievement of students from culturally linguistically diverse (CLD) backgrounds.
4. Students will identify culturally relevant strategies to employ in the classroom to meet the individual learner needs of students from culturally and linguistically diverse backgrounds.
5. Students will develop a lesson plan that embeds culturally responsive pedagogy that addresses the individual needs of students from culturally and linguistically diverse backgrounds.

SPED 3120. Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society**3 Credits (3)**

Curriculum theory and development for special education programs. Various teaching methods utilized with elementary exceptional learners and techniques involved in identifying, adapting, and developing materials will be addressed. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 4110. Low Incidence Disabilities in a Diverse Society**3 Credits (3)**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 4120. High Incidence Disabilities in a Diverse Society**3 Credits (3)**

Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 4130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6**3 Credits (3)**

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 5130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 4140. Reading for Elementary Exceptional Learners in a Diverse Society, 7-12**3 Credits (3)**

Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 4150. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society**3 Credits (3)**

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 5150. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.)
2. Apply effective methods for planning and implementing culturally responsive secondary differentiated content area instruction for exceptional learners in inclusive settings.
3. Identify demands of learning environments of secondary exceptional learners.
4. Identify basic classroom management theories and strategies for individuals with diverse learning needs in secondary environments.
5. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.

SPED 4210. Introduction to Assessment of Diverse Exceptional Learners 3 Credits (3)

Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs. May be repeated up to 3 credits.

Learning Outcomes

1. Compare and contrast the different types of assessment and their purposes.
2. Identify legislation and litigation, which has impacted assessment.
3. Explain the applications and uses of assessments results.
4. Identify widely used (common) measures of psycho-educational assessment and their appropriate application.
5. Identify a variety of techniques for obtaining information regarding students' academic functioning and learning techniques.
6. Identify techniques for assessing students' socio-emotional functioning.
7. Outline the process for identifying exceptional learners and subsequent educational planning utilizing learning theories.
8. Analyze and identify assessment strategies for specific populations (Culturally and Linguistically Diverse, Preschool, Elementary School, etc.)
9. Integrate information gathered through comprehensive assessment procedures into a whole picture of the student's areas of strength, weakness and needs.

SPED 4220. Classroom Management for Diverse Learners**3 Credits (3)**

Behavior-change strategies for exceptional learners. May be repeated up to 3 credits.

Learning Outcomes

1. Plan the organization of a classroom illustrating optimum use of instructional resources (computers, books, writing materials, reference material, manipulatives, creative constructive materials, etc.) that facilitates efficiency and effectiveness of access, use, maintenance, and storage of such resources.
2. Manage student progress data electronically for visual representation of performance for individual students and whole class averages.
3. Design the organization of the physical aspects of a classroom (furniture, areas, etc) for ease of transition, use, safety and traffic flow based on effective designs presented in the literature.
4. Establish classroom procedures and expectation (rules) to promote a positive, effective and efficient learning environment.
5. Construct the organization of a classroom schedule/time management plan that includes various content areas, instructional strategies, grouping strategies, levels of energy use, etc. Within large blocks of time or for an entire day school day.
6. Demonstrate knowledge and skill of affective domain-based theoretical models for (1) setting and managing the emotional tone of a classroom, (2) managing the psycho-social atmosphere of the classroom and individual students, and (3) managing motivation of students to succeed in learning academic content, social skills, self-responsibility skills, and inter-relationship skills with other class members.
7. Analyze a given classroom situation for legal, ethical and professional issues and concerns, by applying legal, ethical, and professional reactions to the situation and provide resolutions to align the classroom legally, ethically, and professionally. This will include all legal bases (state and federal) involving all students, including students with disabilities, ESL and at-risk students.
8. Observe, analyze and document student behavior to match an appropriate intervention strategy to change behavior in a desired direction. This will also include the successful implementation of behavior management strategies for entire classes, small groups, and individual students along with development and maintenance of electronic data collection graphing and analysis.

SPED 4310. Introduction to Autism**3 Credits (3)**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 5310 and SPED 6310. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 4320. Behavior and Autism**3 Credits (3)**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 532 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 4330. Social Skills and Autism**3 Credits (3)**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 5330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 4340. Communication and Autism**3 Credits (3)**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 5340 and SPED 640 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 4810. Early Childhood SPED Student Teaching**9 Credits (9P)**

Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings. Restricted to: TEP-ECED majors. Grading (S/U, Audit). Students must be Admitted into student teaching May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 4811. Practicum in Education, Equity and Cultural Diversity**3 Credits (3)**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. Restricted to: SPED majors.

Prerequisite: SPED 3105 and SPED 3120 or consent of instructor.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

SPED 4820. Student Teaching SPED**9 Credits (9)**

Supervised teaching in a special education classroom and participation in a required seminar. Students must be admitted to student teaching program in order to enroll. Restricted to: SPED majors.

Prerequisite: SPED 4811.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 4830. Special Education/Elementary Student Teaching Seminar**3 Credits (3)**

Discussion of elementary Special Education school issues related to student teaching.

Prerequisite: SPED 4811.

Corequisite: SPED 4820.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

**SPED 4840. Special Education/ Secondary Student Teaching Seminar
3 Credits (3)**

Discussion of secondary school issues related to student teaching.

Prerequisite: SPED 4821.

Corequisite: SPED 4820.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

SPED 4992. Directed Study courses in Special Education**1-3 Credits (1-3)**

Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 4996. Topics**3 Credits (3)**

Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPED 5105. Introduction to Special Education in a Diverse Society**3 Credits (3)**

This course introduces the field of special education to regular educators.

May be repeated up to 3 credits.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 5110. Low Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 6110 with differentiated assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 5120. High Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 5130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6
3 Credits (3)

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 4130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 5140. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12
3 Credits (3)

Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 4140. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 5150. Curriculum, Methods, and Materials for Secondary Special Education
3 Credits (3)

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. May be repeated up to 3 credits.

SPED 5160. Technology and Exceptionality in a Diverse Society
3 Credits (3)

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate familiarity in variety of assistive technology devices and services that are available for students with diverse range of disabilities
2. Demonstrate an understanding of functional approaches to the assessment of assistive technology needs.
3. Describe and implement inter disciplinary approaches to the assessment, selection and the use of technology to meet the educational and transitional demands of individuals with diverse range of disabilities.
4. Identify and describe the function of the range of assistive technology devices and services in diverse settings.
5. Demonstrate an understanding of the legal obligations of different entities in providing training and services that are relevant to assistive technologies.

SPED 5210. Introduction to Assessment of Diverse Exceptional Learners
3 Credits (3)

Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students. Restricted to: SPED majors.

SPED 5220. Classroom Management for Diverse Learners
3 Credits (3)

Behavior-change strategies for exceptional learners. Taught with SPED 4220 with differentiated assignments for graduate students. May be repeated up to 3 credits.

SPED 5230. Advanced Curriculum for Diverse Exceptional Learners
3 Credits (3)

Strategies for developing curricula appropriate to handicapped and gifted learners. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 5310. Introduction to Autism
3 Credits (3)

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 4310 and SPED 6310. Differentiated Assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 5320. Behavior and Autism**3 Credits (3)**

This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 4320 and SPED 6320 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 5330. Social Skills and Autism**3 Credits (3)**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Understand and explore the foundations of TESOL instruction.
2. Analyze the sociocultural theory of teaching English as a second/foreign language.
3. Demonstrate an understanding of culturally responsive pedagogy in language teaching and academic achievement.
4. Evaluate principles of best practices instruction and applications of TESOL methods.
5. Explore assessment issues and concepts related to English Language Learners.
6. Examine the impact of policies, national laws, school and community partnerships, and personal professional development on TESOL instruction.
7. Develop, select, and implement second language teaching methods.

SPED 5340. Communication and Autism**3 Credits (3)**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 6340 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 5405. Foundations of Visual Impairment**3 Credits (3)**

This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. May be repeated up to 3 credits.

Learning Outcomes

1. Differentiate between the impact that visual impairment (both congenital and adventitious) has on a child's/youth's cognitive, language, communication, motor, social-emotional, and autonomous development.
2. Predict the impact that familial, societal, cultural, and professional attitudes have on the self-esteem/self-identity of a child/youth who has a visual impairment and propose culturally responsive strategies to combat low self-esteem/lack of self-acceptance.
3. Identify appropriate educational adaptations, including universal design for learning principles, for teaching students with visual impairments based on predominant sensory channel(s).
4. Describe the prevalence and incidence of visual impairment, educational and legal classifications, service delivery options and regulations, and the roles of educational staff.
5. Analyze how historical foundations shape current issues and trends in the education of students who are visually impaired.
6. Locate sources of specialized materials, service networks, consumer/parent organizations, and professional associations and publications.

SPED 5410. Functional Implications of Low Vision**3 Credits (3)**

This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5405.

Learning Outcomes

1. Use basic terminology to describe the structure and functions of the visual system and describe how the visual system typically develops.
2. Identify the etiology and characteristics of the most common eye conditions and their impact on the development and education of individuals who have these conditions.
3. Describe effects of medications on the visual system and on visual performance. Select, adapt, and use appropriate instruments for assessing functional vision. Follow legal, ethical, and technical procedures while conducting vision screenings or functional vision evaluations in order to determine educational services (including eligibility) and supports.
4. Interpret the results of vision screenings, eye reports, and functional vision evaluations in ways that help students, families and other members of the educational team understand the impact the visual impairment has on learning, experience, and social-emotional well-being.
5. Select individualized strategies for the enhancement of visual/sensory efficiency (including the use of environmental modifications, print material adaptations, optical aids, and non-optical aids) based on performance/assessment data

SPED 5420. Strategies for Teaching Students with Visual and Multiple Impairments**3 Credits (3)**

This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5410.

Learning Outcomes

1. Describe the impact that a concomitant visual impairment and additional disability has on a child's/youth's cognitive, language, communication, motor, social-emotional, autonomous, and sensory development.
2. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the core curriculum (especially literacy) that are based on their unique needs, which transcend the effects of each individual disability.
3. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the expanded core curriculum that are based on their unique needs, which transcend the effects of each individual disability.
4. Choose specialized assessment tools appropriate for learners with visual impairments and additional disabilities.
5. Summarize special considerations related to eligibility determination, educational placement, and service delivery models for students with visual impairments and additional disabilities.
6. Describe special considerations related to effective collaboration with educators, related service providers, educational assistants, community agencies, and families of students with visual impairments and additional disabilities

**SPED 5430. Braille I: Literacy for Students with Visual Impairments
3 Credits (3)**

This course facilitates an in depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5450.

Learning Outcomes

1. Transcribe print content into Unified English Braille following appropriate formatting rules.
2. Read, interline, and proof materials transcribed in Unified English Braille.
3. Read, interline, and proof materials produced in English Braille American Edition.
4. Transcribe, print content into a foreign language using the appropriate braille code.
5. Read, interline, and proof materials produced in foreign language braille.
6. Transcribe a simple score in music braille.
7. Read and interline a simple score in music braille.
8. Produce braille materials using various tools, including a Perkins Brailler, slate and stylus, and six-key keyboard entry.
9. Delineate the ways that congenital and adventitious visual impairments impact literacy and the unique instructional strategies used with each of these groups. 1
10. Identify pre-braille activities that develop essential tactual, motor, and reading readiness skills. 1
11. Compare language arts and braille curricula/assessments for different types of tactual learners. 1
12. Identify sources for obtaining braille resources, services and supports

**SPED 5440. Braille II: Numeracy for Students with Visual Impairments
3 Credits (3)**

This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braille codes for computers, music, and foreign languages will be introduced. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5430.

Learning Outcomes

1. Transcribe mathematical and scientific notation into Nemeth Braille following appropriate rules.
2. Read, and proof materials transcribed in Nemeth Braille
3. Transcribe, print content into a foreign language using the appropriate braille code.
4. Read, interline, and proof materials produced in foreign language braille.
5. Transcribe a simple score in music braille.
6. Read and interline a simple score in music braille.
7. Produce braille materials, including tactile graphics, using various tools, including a Perkins Brailler, six-key keyboard entry, braille translation software, and tactile graphics.
8. Create different task analysis on computational steps for solving problems with the Cranmer abacus using both the counting and indirect methods for beginning abacus users and aligning them to numeracy standards.
9. Delineate the ways that visual impairment impacts literacy and numeracy and describe adapted instructional and assessment materials and resources that make math meaningfully accessible. 1
10. Delineate the ways that visual impairment impacts scientific understandings and describe adapted instructional and assessment materials and resources that make science and social studies meaningfully accessible. 1
11. Delineate the ways that visual impairment impacts understanding of health and sexuality and describe adapted instructional and assessment materials and resources that make health and sex education meaningfully accessible

**SPED 5450. Strategies for Teaching Students with Visual Impairments
3 Credits (3)**

This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptations, IFSP/IEP/ITP planning, and evidence-based practices. Restricted to: SPED majors. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5410.

Learning Outcomes

1. The learner will analyze core curriculum standards and benchmarks in order to determine necessary instruction in the expanded core curriculum so that learners with visual impairments can meaningfully participate in the common core curriculum.
2. The learner will describe professional roles and ethical responsibilities of the teacher of students with visual impairments in relation to effective collaboration with all members of the educational team (particularly families, para educators, and general educators).
3. The learner will select, adapt, and use appropriate assessments for determining effective and efficient primary and secondary learning modalities, literacy media, and access technologies needed for reading and writing.
4. The learner will follow legal, ethical, and technical procedures while conducting learning media assessments and access technology evaluations, reporting findings, and making recommendations regarding necessary educational services and supports.
5. The learner will demonstrate the procurement and use of different access technologies needed to make educational materials and learning activities accessible to learners with visual impairments

**SPED 5460. Introduction to Orientation and Mobility
3 Credits (3)**

This course provides an overview of the history and theory of formalized orientation and mobility instruction as it relates to the ability to live independently. The impact of visual impairment and concomitant impairments on the development of spatial concepts and motor skills in relation to independent locomotion is emphasized. Topics covered include mobility aids; navigation, familiarization, and protective techniques; structured pre-cane assessment and instruction; the development and use of tactual maps; and the relationship of orientation and mobility to other areas of the expanded core curriculum. Consent of Instructor required. Restricted to: SPED, EDUC majors. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: SPED 5420.

Learning Outcomes

1. Describe components of orientation and mobility, the role of the certified orientation and mobility specialist, and the role of the teacher of students with visual impairments/developmental vision specialist in teaching travel skills to students who are blind and visually impaired, including those with additional disabilities.
2. Describe significant historical events and legal provisions related to the formalized profession of orientation and mobility and how this affects the provision of orientation and mobility services.
3. Identify the pros, cons, and prerequisite skills related to different modes of mobility and use of different mobility aids and transportation systems.
4. Describe the impact of impaired vision on cognitive, motor, language, social, and self-help skills and effective interventions that promotes the development of independent locomotion and personal autonomy.
5. Execute (and teach the execution of) basic orientation and mobility techniques under conditions that simulate various degrees of visual and additional impairments using all available sensory information (with and without optical aids) in a variety of environments.
6. Task analyze and adapt activities of daily living to allow individuals with visual impairments to lead productive and healthy lifestyles.
7. Identify sources of adapted products and specialized assessments related to the Expanded Core Curriculum that facilitate participation in home, work, and community activities for employment, self-care, and leisure

SPED 5470. Beginning Orientation and Mobility**3 Credits (3)**

This course provides an overview of the profession of orientation and mobility and how sensory, motor, and psychosocial function affects movement and spatial orientation. Consent of Instructor required.

Restricted to: SPED majors. May be repeated up to 3 credits.

Prerequisite: SPED 5460.

Learning Outcomes

1. Describe how perception and movement develops and is used to enhance safe and independent travel
2. Describe how a traveler is able to acquire, maintain and improve orientation
3. Describe the most common functional mobility problems for students with low vision and what a COMS should consider when providing OM instruction to students with low vision.
4. Describe how development impacts movement and describe issues that impact gait and posture. Describe ways to support and improve sensorimotor development.
5. Describe the psychosocial factors that impact behavior as one learns how to travel and describe ways to teach travelers to deal with
6. Describe the fundamentals of hearing including principles of sound, audition, localization and traffic sounds. Describe ways to develop and improve orientation using hearing
7. Describe the origins of the OM profession and its progression into the present, how OM services are provided around the world and the fundamentals of research in the profession.
8. Evaluate and synthesize literature (publications, research literature) on a selected topic of their choice

SPED 5480. Intermediate Orientation and Mobility**3 Credits (3)**

This course focuses on strategies and methods for conducting assessments and appropriately sequencing skill acquisition for learners across the lifespan who may or may not have additional disabilities.

Adaptive technology and other aids that assist with travel in a variety of environmental conditions using different mobility systems will also be covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.

Prerequisite: SPED 5470.

Learning Outcomes

1. Determine how to modify orientation and mobility instruction, depending on the age of the students, in the following ways: A) describe ways to teach OM to very young children; B) describe ways to teach OM to school age children; C) describe ways to teach OM to adults; and D) describe ways to teach OM to older adults.
2. Demonstrate an understanding of mobility systems and adaptations used by blind and visually impaired travelers in the following ways: A) describe how adaptive technology is used in travel; B) describe how dog guides are used in travel; C) describe orientation aids that can be used for students with vision loss; D) describe issues around environmental accessibility for student with vision loss; and E) describe how to teach OM in adverse weather conditions
3. Demonstrate understanding of how to teach OM to students who have different disabilities in the following ways: A) describe ways to teach OM to learners with vision and hearing loss; B) describe ways to teach OM to learners with vision, physical and health impairments; C) describe ways to teach OM to learners with cognitive impairments and vision loss; D) describe ways to teach OM to learners with cortical visual impairments; and E) describe how to teach travel skills to learners with nonvisual disabilities
4. Conduct an OM assessment and teach OM in the following ways: A) describe the components of a comprehensive OM assessment; B) describe creative ways to provide OM instruction; C) describe theories and best practices for teaching orientation and mobility; and D) describe ways to teach concepts creatively

**SPED 5490. Advanced Orientation and Mobility
3 Credits (3)**

This course focuses on the development and monitoring of cane skills needed for safe and efficient travel in indoor, residential, and business districts, including the use of public transportation systems. Development, administration, and supervision of orientation and mobility services is also covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.

Prerequisite: SPED 5480.

Learning Outcomes

1. Use orientation and mobility techniques to travel independently, safely and efficiently in a variety of environments including indoor, residential, small business and business areas while blindfolded or under low vision simulator.
2. Provide appropriate and safe orientation and mobility instruction to fellow students, who are blindfolded or wearing low vision simulators, while traveling in indoor, residential, small business and business areas
3. Describe modifications to traditional OM techniques for diverse learners of various ages with different degrees of visual functioning and with a variety of additional disabilities
4. Use public transportation while blindfolded or under low vision simulator and provide instruction to fellow students who are blindfolded or wearing low vision simulators in the use of public transportation
5. Critically analyze one's teaching and monitoring through self-observation and reflective practices

**SPED 5810. Student Teaching SPED
6 Credits (6)**

Culminating course required for graduate level students seeking initial licensure. Students must have completed a Bachelor's degree and be admitted to student teaching program to enroll. Restricted to: SPED majors.

Prerequisite: SPED 5811.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

**SPED 5811. Field Experience in Education, Equity & Cultural Diversity
3 Credits (3)**

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. This experience is designed for both the practicing general education classroom teacher pursuing special education licensure and for graduate teacher candidates pursuing initial special education licensure. Restricted to: SPED majors.

Prerequisite: SPED 3105 and SPED 3120, or SPED 5105 and SPED 5230, or consent of instructor.

Learning Outcomes

1. Learners will demonstrate critical thinking skills and critical reflection and use current special education research to make and evaluate instructional decisions across the full range of learning tasks (including identifying appropriate learning objectives, selecting methods and materials, assessing student progress in relation to learning objectives, making classroom management decisions, and evaluating the results of decisions and implementation of lessons).
2. Learners will create access to grade level general education curriculum for a broad range of students with diverse learning needs. This will be accomplished by using grade level standards and extended standards (as appropriate), following the requirements expressed in IEP's, and designing and implementing appropriate instruction that addresses students' needs, learning styles, motivation, and cultural and linguistic differences. Universal design, differentiation, accommodation, and modification will be used to address diverse learning needs.
3. Learners will further develop, refine, and demonstrate the dispositions necessary to enter student teaching, with the ultimate goal of entering and advancing the teaching profession. This includes a) building rapport, positive communication, and a cooperative work environment with students, families, teachers, supervisors, instructors, educational/instructional assistants, service providers, and others in the school community b) demonstrating respectful and responsive attitudes toward individuals with exceptionalities from diverse backgrounds, as well as their families and service providers c) demonstrating responsible task performance d) adhering to the CEC code of ethics and university/site policies and procedures.
4. Learners will select and use appropriate technology to support student learning.
5. Learners will apply knowledge of the historical background and current laws and procedures within the field of special education to contextualize, explain, and evaluate special education services.

**SPED 5820. Masters Degree Seminar
3 Credits (3)**

Capstone review of current issues in special education. Each student will participate in a practice comprehensive oral exam. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

**SPED 5830. Special Education/Elementary Student Teaching Seminar
3 Credits (3)**

Discussion of elementary Special Education school issues related to student teaching.

Prerequisite: SPED 5811.

Corequisite: SPED 5810.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

**SPED 5840. Special Education/Secondary Student Teaching Seminar
3 Credits (3)**

Discussion of secondary Special Education school issues related to student teaching.

Prerequisite: SPED 5811.

Corequisite: SPED 5810.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

**SPED 5850. Current Research in Special Education
3 Credits (3)**

Current investigations and research techniques. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

**SPED 5860. Current Issues in Special Education for Teaching in Culturally Responsive Society
3 Credits (3)**

Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 6860. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn several concepts, issues, and theories in contemporary special education in order to be a more intelligent consumer of information about special education.
2. Students will analyze, evaluate, and make decisions concerning complex contemporary issues in special education.
3. Students will demonstrate communications skills, both written and oral, in order to enhance their effectiveness in expressing their view on the issues related to special education.
4. Students will examine issues related to the human experience as it relates to diversity and a culturally and linguistically diverse world.
5. Students will debate the pros and cons of current special education issues

**SPED 5870. Early Childhood SPED Student Teaching
6 Credits (6)**

A student teaching experience designed for students studying early childhood special education. Restricted to TEP-ECED majors. Students must be admitted to student teaching to enroll. May be repeated up to 9 credits.

Learning Outcomes

1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

**SPED 5990. Practicum in Reading Disabilities
3 Credits (3)**

Supervised experience in assessing a student with reading disability, developing and intervention plan, and implementing and monitoring the interventions across time. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

**SPED 5991. Special Research Problems
1-3 Credits (1-3)**

Individual investigation either analytical or experimental. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

**SPED 5996. Topics in Special Education
1-3 Credits (1-3)**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPED 5999. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

SPED 6110. Low Incidence Disabilities**3 Credits (3)**

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 5110 with differentiated assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 6120. High Incidence Disabilities in a Diverse Society**3 Credits (3)**

Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 5120. Master's Degree. Restricted to SPED and C D majors. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 6160. Technology and Exceptionality in a Diverse Society**3 Credits (3)**

This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 5160.

Learning Outcomes

1. Carry out effective practicum practices for using technology with diverse learners.

SPED 6170. School Intervention and Organization in a Diverse Society**3 Credits (3)**

Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective interventions in a variety of classroom and organizational settings.

SPED 6310. Introduction to Autism**3 Credits (3)**

This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Differentiated Assignments. Taught with SPED 5310 and SPED 4310. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 6330. Social Skills and Autism**3 Credits (3)**

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 5330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 6340. Communication and Autism**3 Credits (3)**

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 5340 and differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 6810. Doctoral Seminar**1-4 Credits (1-4)**

The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

SPED 6830. Current Research in Special Education**3 Credits (3)**

Required for students seeking the Ed.D./Ph.D. M.A. degree. Restricted to majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

SPED 6840. Current Issues in Special Education for Teaching in a Culturally Responsive Society**3 Credits (3)**

Required for students seeking the Ed.D./Ph.D. May be repeated up to 3 credits.

SPED 6991. Doctoral Research**1-15 Credits (1-15)**

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

SPED 6996. Selected Topics in Special Education**1-6 Credits (1-6)**

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPED 6997. Independent Study Topics in Special Education**1-6 Credits (1-6)**

A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

SPED 6998. Internship in Special Education**1-6 Credits (1-6)**

Each course bears a qualifying subtitle. Maximum of 6 credits per semester. May be repeated up to 99 credits.

SPED 7000. Dissertation**1-9 Credits (1-9)**

Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated up to 24 credits.

Learning Outcomes

1. Varies

SPHS-SPEECH & HEARING SCIENCE

SPHS 2110. Introduction to Communication Disorders**3 Credits (3)**

This introductory course provides an overview of common speech, language, and hearing disorders in children and adults including etiologies, characteristics, prevention, identification, assessment and intervention. The course provides an overview of the field of speech-language pathology and audiology. May be repeated up to 3 credits.

Learning Outcomes

1. Describe normal human communication anatomy and processes as they relate to speech and language production.
2. Describe the nature of speech, language, and hearing disorders and differences.
3. Describe the principles of prevention, assessment and intervention of communication disorders.
4. List requirements for licensure, certification, and other relevant professional credentials.
5. Exhibit basic knowledge of contemporary professional issues in speech-language pathology.
6. List possible psychosocial implications of various communication disorders.
7. Identify cultural, educational, legal, and ethical issues related to communication disorders.
8. Describe the scope of practice of speech-language pathologists and audiologists.

SPHS 4510. Phonetics**3 Credits (3)**

The science of phonetics, including work with the International Phonetic Alphabet. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110; Cumulative GPA of 3.2 or better.

Learning Outcomes

1. Students will learn and be able to describe the linguistic and articulatory characteristics of speech sounds.
2. Students will be able to identify, recall and extrapolate information about the biological bases of speech sound production.

SPHS 4520. Audiology**3 Credits (3)**

Anatomy and physiology of the auditory system, bases of auditory disorders, and basic audiometric procedures. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, and a minimum of 3.2 GPA.

Learning Outcomes

1. Describe the properties of sound.
2. Define the terms used to describe hearing and hearing loss.
3. Describe the anatomy and physiology of the auditory system at an introductory level.
4. Identify basic audiometric procedures.
5. Interpret basic audiometric test findings.
6. Recognize common auditory (and related) disorders.
7. Discuss basic approaches to managing auditory (and related) disorders.

SPHS 4610. Language Acquisition**3 Credits (3)**

This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110; Cumulative GPA of 3.2 or higher.

Learning Outcomes

1. Describe the development of phonology, semantics, morphology, syntax, and pragmatics.
2. Describe biological, cognitive, social aspects of language acquisition.
3. Describe the current methods for studying language acquisition and critically evaluate their contributions to our understanding of how children learn language.
4. Describe and critically evaluate current theories of language acquisition in relation to the available data and to each other.
5. Apply basic observational methods to draw conclusions about a child's level of language knowledge.

SPHS 4620. Speech and Hearing Science**3 Credits (3)**

Basic concepts and theories in acoustics, speech production and speech perception. Includes laboratory experience with instrumental measurement and analysis of speech systems. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110, SPHS 4510, SPHS 4520; and minimum 3.2 GPA.

Learning Outcomes

1. Students will learn basic acoustic physics and be able to describe simple harmonic motion, complex waveforms, and resonances.
2. Students will learn about the acoustic consequences of the three articulatory parameters tongue height, tongue advancement, and lip rounding during vowel production in order to be able to understand the acoustics of vowels and diphthong acoustics.
3. Students will learn the acoustic properties of English consonants including stops, fricatives, affricates, liquids, glides, and nasals.
4. Students will learn about speech perception, including categorical perception, theories of speech perception as well as some basic psychoacoustic properties such as the decibel scale.

SPHS 4710. Speech Disorders Across the Lifespan**3 Credits (3)**

Bases, symptoms, etiologies, and clinical management of issues related to disorders of articulation, phonology, voice and resonance, and fluency. Restricted to: CD majors. May be repeated up to 3 credits.

Prerequisite: SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, and SPHS 4610; and minimum 3.2 GPA.

Learning Outcomes

1. Describe diverse etiologies of speech disorders and compare/contrast assessment procedures (ASHA Standard III-B)
2. Define and compare/contrast the classification for a variety of speech disorders. (ASHA Standard III-C)
3. Differentiate between a speech disorder vs a difference that can be attributed to culturally and linguistically different groups. (ASHA Standard III-D)
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of speech disorders. (ASHA Standard III-D)

SPHS 4715. Language Disorders Across the Life Span**3 Credits (3)**

Bases, symptoms, etiologies, and treatment of language disorders. Includes review of normal language acquisition. May be repeated up to 9 credits.

Prerequisite: SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4610, SPHS 4620, 3.2 cumulative GPA.

Learning Outcomes

1. Describe diverse etiologies of language disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of language disorders. (ASHA Standard III-C).
3. Differentiate between a disorder vs a difference that can be attributed to culturally and linguistically different groups. (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of language disorders. (ASHA Standard III-D).

SPHS 4720. Anatomy and Physiology of Speech Mechanisms**3 Credits (3)**

Structure and function of systems underlying human speech sound production and processing, including respiratory, phonatory, and articulatory components. May be repeated up to 3 credits.

Prerequisite: C- or better in SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, and SPHS 4610; and minimum 3.2 GPA.

Learning Outcomes

1. Students will learn and be able to identify respiratory anatomy important for speech production.
2. Students will be able to identify, recall and extrapolate information about respiratory physiology.
3. Students will learn and be able to identify laryngeal anatomy important for speech production.
4. Students will be able to identify, recall and name important physiological mechanisms for controlling vocal function.
5. Students will learn and be able to identify supraglottal anatomy important for speech production.
6. Students will be able to identify, recall and name physiologic events about resonance and articulation.

SPHS 4810. Clinical Methods and Procedures**3 Credits (3)**

Guidelines and procedures associated with the clinical and supervisory processes. Provide opportunities to complete the supervised clinical observation requirement for participation in clinical practicum. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4610; and minimum 3.2 GPA.

Learning Outcomes

1. Demonstrate basic use of professional terminology in the area of Speech-Language Pathology
2. Demonstrate knowledge of principles and techniques of the observation of nonverbal and verbal behavior of clients and clinicians using oral and written reporting, as well as in-class discussions.
3. Complete twenty-five clock hours of supervised clinical observation of speech, language, and hearing services.

SPHS 4820. Neural Bases of Communication Disorders**3 Credits (3)**

Study of the neuroanatomy and neurophysiology of communication and communication disorders. Includes review of the central nervous system and peripheral nervous system relationship to speech motor control, language, and hearing. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, SPHS 4610, SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4710, SPHS 4720, SPHS 4810 and minimum 3.0 GPA.

Learning Outcomes

1. Demonstrate knowledge of the gross anatomy and physiology of the central, peripheral, autonomic nervous systems.
2. Understand the clinical manifestations associated with injury/disease to a given regions/systems within the nervous system.

SPHS 4830. Aural Rehabilitation**3 Credits (3)**

Overview of hearing aids and amplification devices including cochlear implants. Review of the bases and psychosocial aspects of hearing loss. Clinical management of hearing loss consistent with ASHA's scope of practice for SLPs. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: B or better in SPHS 2110, SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4610, SPHS 4710, SPHS 4720, SPHS 4810; and minimum 3.2 GPA.

Learning Outcomes

1. Define and use the appropriate terminology when discussing hard of hearing and deafness.
2. Describe and explain the effects of hearing impairment on speech-language acquisition and auditory/speech perception.
3. Describe the effects of hearing impairment on various aspects of life (e.g., cognitive, educational, occupational, and psycho-social aspects in all age ranges).
4. Identify the communication needs and develop a basic understanding of common intervention options including communication strategies, auditory training, speech reading, hearing aids, assistive devices, and cochlear implantation.
5. Be acquainted with the relevant public laws.

SPHS 5110. Research Methods**3 Credits (3)**

Introduction to basic qualitative, quantitative, and single subject research methodology in speech-language pathology and audiology. Restricted to CD,CDS majors. May be repeated up to 3 credits.

Prerequisite: a course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate knowledge of the concepts of research ethics and integrity including protection of human subjects.
2. Demonstrate comprehension of concepts of evidence-based practice.
3. Locate, use, and critically evaluate library and online sources that support the investigation of research questions pertinent to speech-language and hearing science.
4. Interpret basic single variable and two-variable statistical procedures appropriate for single and group designs.
5. Read, abstract, and critically evaluate pertinent research.

SPHS 5120. Assessment of Communication Disorders**3 Credits (3)**

Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate knowledge of testing statistics and basic concepts in psychometric assessment.
2. Formulate, implement and summarize one complete successful and efficient assessments: including pre-planning meeting, interview design and implementation, administration of instruments, analysis and integration of results and report writing.
3. Review, summarize and critique one assessment tool for design, use, interpretation and cultural/linguistic inclusivity to classmates.
4. Given case study information, students will be able to: choose an appropriate instrument from assessment tools reviewed; develop an assessment plan for a client; write a report and develop treatment goals.

SPHS 5130. Pediatric Language and Disorders**3 Credits (3)**

Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Minimum grade of B and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate a working knowledge of the major theories of language acquisition and theoretical perspectives of disorders.
2. Demonstrate an understanding of the aspects related to dialect and second language acquisition of English.
3. Demonstrate knowledge of the core principles of language assessment for the pediatric population (zero-five year old).
4. Summarize and interpret content material relating to pediatric language development/disorders.

SPHS 5140. Speech Sound Disorders**3 Credits (3)**

Advanced study of the symptoms, etiologies, assessment, and clinical management of speech sound disorders including those due to cleft palate and disorders of resonance. May be repeated up to 3 credits.

Prerequisite: A minimum grade of B in all graduate courses and a minimum overall GPA of 3.0 is required.

Learning Outcomes

1. Course Goals – Fulfillment of the following Standards of the American Speech-Language-Hearing Association (ASHA): IV-B, IV-C, IB-D, and IV-F: Students will be able to explain the classification of speech sounds based on different phonological theories, and they will be able to phonetically transcribe standard and non-standard speech. Summative Assessment: Test I (IV-B, IV-C)
2. Students will be able to describe the impact of anatomical, motor, sensory, cognitive-linguistic, and social factors in speech development, and developmental profiles associated with developmental and syndromic conditions. Summative Assessment: Test 2 (IV-C)
3. Students will be able to identify appropriate assessment tools and practice their use for the diagnosis of speech sound disorders. Formative Assessment: Project 1 (IV-D)
4. Students will learn to research different treatment approaches for the successful remediation of speech sound disorders and to integrate research into evidence-based clinical practice. Formative Assessment: Research Article Presentation Treatment Presentation (IV-F)
5. Students will familiarize themselves with current research in the area of speech sound disorders as well as foundational original research papers in the field. Formative Assessment: Research Article Presentation (IV-F)

SPHS 5210. School Age Language and Disorders**3 Credits (3)**

Normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A minimum grade of B in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Demonstrate a working knowledge of legislation governing service provision in the schools (IDEIA, NCLB) and implementation practices (IEP, five-hundred-four plan, RtI).
2. Demonstrate knowledge of normal language development of school-age children.
3. Demonstrate understanding of language disorders relevant to school-age children.
4. Demonstrate knowledge of evidence-based intervention methodologies for the treatment of language disorders in the school-aged population.

SPHS 5220. Aphasia & Cognitive Linguistic Disorders**3 Credits (3)**

Etiologies, diagnosis, assessment, and treatment of adult aphasia and cognitive-linguistic disorders. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Describe the nature, prevention, assessment, and intervention of aphasia and cognitive communication disorders in adults.
2. Describe cognitive and social aspects of communication, psychological, neurologic, and cultural correlates, as well as other types of diversity (i.e., age, gender, etc.) as it relates to aphasia in adults.
3. Describe the nature of normal cognitive processing, including attention, memory.
4. Apply theory of cognitive and social aspects of communication, psychological, neurologic, and cultural correlates, as well as other types of diversity (i.e., age, gender, etc.) as it relates to aphasia and cognitive communication disorders.
5. Identify ethical issues related to treatment regarding aphasia and cognitive communication disorders.

SPHS 5230. Fluency Disorders**3 Credits (3)**

Speech fluency development and the disorders of stuttering, cluttering, and neurogenic dysfluency. Restricted to: C DS,C D majors.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Define/describe terminology and nomenclature associated with the study of human fluency disorders.
2. Identify constitutional and environmental conditions that contribute to fluency disorders.
3. Propose methods of assessing and treating the affective, behavioral and cognitive aspects of fluency disorders across the lifespan, including the use of augmentative devices for fluency.
4. Be able to explain the role of counseling in treating fluency disorders and how that role changes with the age of the client.
5. Be able to explain the role of counseling in treating fluency disorders and how that role changes with the age of the client.

SPHS 5310. Introduction to Augmentative and Alternative Communication**3 Credits (3)**

Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Graduate standing; overall GPA of 3.0.

Learning Outcomes

1. Understand and consider physical and psycho-social, linguistic, and cognitive characteristics of AAC users.
2. Describe assessment methods to determine the best fit of AAC systems to meet the needs of AAC users.
3. Understand how to provide training in the use of various AAC systems for AAC users, their families, and caregivers and educators.

SPHS 5320. Acquired Neurogenic Communication Disorders**3 Credits (3)**

Topics include attention, memory, executive function, and underlying neuropathologies, with emphasis on assessment, diagnosis, prognosis, treatment and recovery processes in cognitive communication disorders related to traumatic brain injury, dementia, and right hemisphere brain damage. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0.

Learning Outcomes

1. Compare, contrast, and differentiate neural bases and etiologies for TBI, RHD, and Dementia.
2. Assess deficits in cognitive-linguistic communicative competence.
3. Recommend and design appropriate management plans for individuals with cognitive-linguistic impairments.
4. Recognize the significance of culture, age, and ethnicity on the assessment and treatment of cognitive-linguistic communication disorders.
5. Reflect on and prepare clients and families for the impact of cognitive-linguistic impairments and re-entry to school, work, family, and/or the community.

SPHS 5330. Dysphagia**3 Credits (3)**

Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Define the anatomy and physiology of normal swallowing and causes of abnormal swallow in the pediatric to geriatric age ranges.
2. Define dysphagia team components.
3. Describe protocol for clinical and instrumental dysphagia evaluation.
4. Describe dysphagia diagnosis and treatment.

SPHS 5340. Motor Speech Disorders**3 Credits (3)**

Advanced studies of dysfunction of the nervous system that affect speech. Includes evaluation, diagnosis, and treatment of speech apraxias and dysarthrias. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Recognize evaluate motor speech disorders - differentiating between flaccid, spastic, unilateral upper motor neuron, ataxic, hypokinetic, hyperkinetic, mixed dysarthria, as well as apraxia.
2. Identify the etiology of the various motor speech disorders.
3. Demonstrate knowledge of methods to assess the various subsystems (resonance, articulation, phonation, and respiration) and determine relative contribution of each system to the motor speech disorder.
4. Demonstrate knowledge of various interventions for clients with various motor speech disorders.

SPHS 5350. Voice Disorders/Head and Neck Anomalies**3 Credits (3)**

Advanced studies of anatomy and physiology of the vocal tract with emphasis on diagnosis, assessment, and treatment of voice disorders, laryngectomy, cleft palate, and other oral-facial anomalies. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Recognize and describe relevant anatomy and physiology of normal voice production, including laryngeal and respiratory anatomy and physiology
2. Identify and discuss structural, neurologically-based, and functional voice disorders.
3. Demonstrate knowledge of approaches to assess voice disorders, including objective and subjective measures.
4. Explain and demonstrate selected intervention techniques for voice disorders.

SPHS 5360. Communication Disorders in Neurodiverse Populations**3 Credits (3)**

This course is primarily aimed at providing meaningful foundations for the application of evidence-based intervention designs that enhance the development of communication skills for individuals with Autism Spectrum Disorders across the lifespan. May be repeated up to 6 credits.

Learning Outcomes

1. Identify and implement evidence-based interventions for individuals with ASD across a range of ages and abilities
2. Evaluate several evidence-based interventions and determine the best fit based on a client scenario
3. Discuss key features of evidence-based interventions for individuals with ASD
4. Implement evidenced communication interventions with individuals with ASD

SPHS 5410. Professional Issues and Multicultural Practices in Communication Disorders**3 Credits (3)**

This course includes a range of topics pertinent to students entering professional practice as speech-language pathologists including current legal, cultural, ethical, and clinical service provision issues. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Minimum of 3.0 GPA.

Learning Outcomes

1. Describe current issues in professionalism, ethics, and liability in the profession of Speech-Language Pathology.
2. Understand setting-specific employment issues, including working with culturally and linguistically diverse populations.
3. Understand the procedures necessary for obtaining licensure and certification by state and national agencies, as well as maintenance requirements for licensure and certification in Speech-Language Pathology.

SPHS 5510. Advanced Spanish Morpho-Syntax for Education**Professionals****3 Credits (3)**

This class has been designed for Heritage Speakers of Spanish who work in educational settings. It will cover the essential linguistic theory and fundamental structures of the Spanish language. This includes, but is not limited to, verb morphology, morphosyntactic and syntactic structures. The main goal of this course is to determine what usages fall within the norms of an individual's speech community, or if there are elements that fall outside those norms. Students have to be fluent in Spanish as course will be conducted in Spanish.

SPHS 5520. Best Practices in Bilingual/Multicultural Assessment for Practitioners**3 Credits (3)**

The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

SPHS 5988. Clinical Education**1 Credit (1)**

This course is specifically designed to target the knowledge base necessary to initiate clinical practicum in the CD Program. The learning objectives are based upon the Council of Academic Accreditation in Audiology and Speech-language Pathology (CAA) standards and knowledge areas. These learning outcomes are developed to assist students in clinical practicum and are specific to the services provided to clients of the NMSU Edgar R. Garrett Speech and Hearing Center. Restricted to: C DS,C D majors. May be repeated up to 2 credits.

Corequisite: SPHS 5990.

Learning Outcomes

1. Demonstrate an understanding of successful strategies to work with families and clients from various clinical settings/cultural backgrounds.
2. Demonstrate an understanding of ethical and confidential service delivery.
3. Identify characteristics of properly written clinical reports.
4. Demonstrate skill in oral and written or other forms of communication sufficient for entry into professional practice.
5. Demonstrate knowledge of entry level and advanced certifications, licensure, and other relevant professional credentials.

SPHS 5989. Externship in Communication Disorders**3-9 Credits (3-9)**

This course is designed to provide opportunities for the developing clinician to provide treatment to and evaluations for clients in a full term externship experience under the supervision of a licensed SLP. Restricted to: C DS majors. May be repeated up to 9 credits.

Learning Outcomes

1. Various

SPHS 5990. Practicum in Speech-Language Pathology**1-4 Credits (1-4)**

Supervised clinical practice in a variety of speech, language, and hearing disorders. Practicum includes diagnostic, treatment, and management work through direct patient/client contact. Attendance at weekly clinical staff meetings is required. Restricted to: C DS,C D majors. May be repeated up to 15 credits.

Prerequisite: Good standing in the graduate school; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Various

SPHS 5996. Special Topics**1-9 Credits (1-9)**

Individual and/or group study of special topics identified by subtitle. Restricted to: C DS majors. May be repeated up to 9 credits.

Prerequisite: Prior arrangement with faculty; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Varies

SPHS 5999. Master's Thesis**1-15 Credits (1-15)**

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Various

SPMD-SPORTS MEDICINE

SPMD 1110. Introduction to Athletic Training**3 Credits (3)**

Introduction to the principles of athletic training. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the historical development of athletic training and sports medicine.
2. Understand the knowledge and experiences needed to become a Certified Athletic Trainer.
3. Understand the specific responsibilities and duties of an athletic trainer.
4. Understand the diverse jobs settings within the profession of athletic training.
5. Understand the relationship between the athletic trainer and the sports medicine team.
6. Understand some of the general and specific injuries and medical conditions that occur in athletics; their causes, signs and symptoms, treatments, rehabilitation, and prevention.
7. Understand some of the contemporary issues and problems facing the athletic training profession.

SPMD 1120. Medical Terminology**3 Credits (3)**

Study of the structure of medical language with emphasis on sports medicine-related terminology. To include analysis and interpretation of medical documentation. Restricted to: Las Cruces campus only.

Learning Outcomes

1. Master the fundamentals of word analysis, including the separation of terms into word roots or combining forms, common prefixes, and suffixes.
2. Differentiate types of medical terms and the relationships among terms.
3. Develop a proficiency in the use of physiological and anatomical terms as reflected in medical documents.
4. Master the terms, words, phrases, and symbols that describe the human body in its various states of health and disease, including essential anatomical terms.

SPMD 1190. Clinical Practicum I**2 Credits (2)**

Introduction to the clinical aspects of the athletic training education program. Must maintain at least 3.0 GPA. May be repeated up to 4 credits.

Learning Outcomes

1. The Athletic Training Program application procedures.
2. The ability to perform selected taping and wrapping techniques.
3. Knowledge of HIPAA guidelines, pre-participation physical examinations, environmental illnesses, the history of Athletic Training and its governing bodies, Evidence Based Practice and its implications in the field of athletic training, evaluation procedures for the injured athlete, NMSU AT program and its affiliated clinical sites.
4. Proper documentation for the athletic training environment including SOAP notes.

SPMD 1195. Clinical Practicum II**3 Credits (3)**

Athletic training related content and psycho-motor skills are introduced, enhanced, and assessed in the classroom and clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses while providing increased depth of understanding and clinical practice. Must maintain a 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge and skill in emergency situation prevention, recognition, and management.
2. Demonstrate proficiency in basic skills of musculoskeletal injury recognition and management.
3. Demonstrate competency in basic pre-participation exam skills, including but not limited to taking vital signs.
4. Demonstrate competency in wound care and first aid.

SPMD 1310. Introduction to Kinesiology**3 Credits (3)**

An introduction to the field of Kinesiology which will explore areas such as exercise physiology, sport and exercise psychology, motor behavior, biomechanics, strength and conditioning, exercise prescription, as well as professional and graduate programs, and allied health and applied careers opportunities.

Learning Outcomes**SPMD 1350. Social Foundations of Physical Activity****3 Credits (3)**

Historical and cultural foundations and vocational, scientific, and educational data on careers in health education, physical education, and recreation.

Learning Outcomes

1. Improve students' knowledge of foundations of physical education. (Research) (Standard 4 j, k, l, m, o, p)
2. Improve students' abilities to analyze current physical activity issues based on historical, philosophical, sociological, and psychological perspectives. (Research) (Standard 4 l, m, e, g)
3. Improve students' knowledge of and ability to critically analyze how gender, race, social class, sexual orientation, and ability issues affect physical education and performance programs. (Research, Diversity) (Standard 4j, k, l, m, o; Standard 2 d, g, j, f, k)
4. Improve students' knowledge of forces influencing the development of physical education programs. In particular, attitudes, values, and beliefs about gender, race, social class, sexual orientation, and ability, etc. (Diversity, Practitioners, Reflection, Pedagogy) (Standard 1 a, b, h, l; Standard 4 j, k, l, m, o; Standard 2 a, d, g, j, f, k)
5. Improve students' knowledge of strategies for becoming an advocate in the school and/or community to promote a variety of physical activity opportunities. (Practitioners) (Standard 2 m, n; Standard 3 n, o, p, q, r; Standard 10 d, j, p)
6. Improve students' knowledge of current educational issues and trends. In particular, socio-cultural issues that affect educational, fitness, and sports settings. (Diversity, Research) (Standard 4 j, k, l, m, o, p Standard 9 a, c, e, f, m, n)
7. Improve students' knowledge of how students' learning is influenced by individual experiences, talents, and prior learning, including language and family/community values and conditions. (Diversity, Research) (Standard 1 b, h, l; Standard 2 d, g, j, k, m, n, o; Standard 3 l)
8. Improve students' knowledge of the impact of international changes on the content of physical education, fitness, and sports programs. (Research) (Standard 4 j, k, l, m, o, p)
9. Improve students' ability to critically analyze how gender, race, sexuality and social class issues affect how we view the body, and how these views can affect students' health and participation in physical education, fitness, and sports programs. (Diversity, Reflection) (Standard 2 d, g, j, f, k, m, o) 1
10. Improve students' ability to become critically aware of how their feelings, beliefs, and values in relation to gender, race, social class, sexual orientation, and ability issues will affect their abilities to work as professionals in the fields of physical education, sport, or fitness. (Diversity, Reflection) (Standard 2d, g, j, f, k, m, o Standard 9 e, d, g, l, m) 1
11. Improve students' knowledge of and ability to critically analyze cultural stereotypes of diverse populations of people. (Diversity) (Standard 2 d, g, j, f, k, m, o) 1
12. Improve students' knowledge of how cultural stereotypes influence the development of physical education, fitness and sport programs. (Research, Diversity) (Standard 2 d, g, j, f, k, m, o; Standard 4 j, k, m, o, p, q Standard 8 p) 1
13. Improve students' knowledge of how groups influence individuals, and how individuals influence groups in a democratic society.

SPMD 2130. Emergency Response in Sports Medicine**2 Credits (2)**

Designed to provide knowledge and experience in emergency care procedures, blood borne pathogens, and first aid. Students will receive certification in CPR/AED for the Professional Rescuer and in First Aid, upon successful completion of course. May be repeated up to 4 credits.

Prerequisite: Consent of Instructor.

Learning Outcomes

1. Identify the individuals involved in the Emergency Response Team
2. Construct the components of an effective emergency Action Plan
3. Assess the scene and patient during an emergency situation
4. Demonstrate proper universal precautions and wound care
5. Demonstrate effective Cardiopulmonary Resuscitation, AED use
6. Demonstrate effective Rescue Breathing Airway Management techniques
7. Demonstrate effective splinting techniques
8. Demonstrate understanding of the techniques utilized in cervical stabilization
9. Identify components of acute care for general medical and orthopedic emergencies.

SPMD 2210. Anatomy and Physiology I**3 Credits (3)**

Detailed study of the structure and function of the human musculoskeletal, cardiovascular, respiratory, and peripheral nervous systems. Designed specifically for students interested in allied health professions.

Learning Outcomes

1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2210L. Anatomy and Physiology Laboratory**1 Credit (1P)**

Students will engage in activities designed to enhance appreciation of the anatomical structures related to the content areas for SPMD 2210. Restricted to Las Cruces campus only.

Learning Outcomes

1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2250. Fitness for Health and Sport**3 Credits (3)**

A study of the fitness needs for health enhancement and sport participation.

Learning Outcomes

1. Recognize the importance of incorporating positive fitness/wellness habits within one's lifestyle in terms of enhancing longevity, disease prevention, and overall quality of life.
2. Examine various physiological benefits and adaptations to such factors as muscular strength, muscular endurance, cardiovascular fitness, flexibility, and body composition when certain stimuli are applied to each. Assessment of these characteristics will be witnessed primarily in practical experiences within the course's laboratory settings.
3. Identify current trends and/or health patterns within society in regards to scientific findings, declination in health habits, and increases in health ailments.
4. Compare various nutritional concepts, specifically proper dietary habits and their impact on weight management aspects.
5. Describe the role physical activity and sport specific training play on competitive athletic performance.

SPMD 2310. Career Preparation**1 Credit (1)**

From concept to implementation: Career exploration, setting up degree plans, finding graduate programs, developing professional resumes, writing letters of application, seeking letters of recommendation, and interview preparation.

Learning Outcomes

1. Career opportunities within human movement and allied health fields
2. Chose both a primary and secondary career of their interest
3. Search for appropriate graduate schools to match their career choices
4. Create a plan by aligning their undergraduate curriculum with their career choices
5. Explore additional education (dual majors, minors, and certifications specific to their chosen field)
6. Study and create a professional resume
7. Create a curriculum vita as a historical reference for future job prospects
8. Write a professional letter of application for jobs and school applications
9. Learn how to seek "outstanding" letters of recommendation 1
10. Study appropriate interview protocol 1
11. Practice interviews (one on one, panel and group)

SPMD 3010. Orthopedic Examination, Evaluation and Diagnosis of Lower Extremity Injuries**4 Credits (3+1P)**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatomy following athletic injury to the lower extremity. Must maintain at least 3.0 GPA. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the lower extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine and apply therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries.

SPMD 3050. Therapeutic Modalities**4 Credits (4)**

The physiological effects, indications, contraindication, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. May be repeated up to 4 credits. Must maintain 2.75 GPA.

Prerequisite: Consent of Instructor, SPMD 2210.

Learning Outcomes

1. Demonstrate proper assessment techniques to identify appropriate therapeutic modalities for the treatment of injury and illnesses.
2. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
3. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.
4. Perform appropriate documentation of treatments to include patient history, evaluation, treatment goals, expectations and treatment outcomes.
5. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.

SPMD 3090. Clinical Practicum III**3 Credits (3)**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Practice sessions are conducted to assist the student in achieving clinical proficiency skills.
2. Depending on the difficulty level, selected clinical proficiencies will be evaluated in this clinical.
3. For those proficiencies indicated, students will need to show proficiency either in this clinical or in a later clinical class.

SPMD 3093. Clinical Practicum IV**3 Credits (3)**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Identify and locate muscles, tendons, ligaments and bony structures.
2. Demonstrate basic evaluation skills, including but not limited to: taking a history, observation, differential diagnoses, palpation, ROM, neurological/circulation, MMT, special tests, clinical impression, plan.
3. Demonstrate taping, bracing skills, appropriate emergency care skills, select and properly fit athletic equipment, appropriate removal of athletic equipment in the event of an emergency, the ability to develop and answer a clinically relevant question.

SPMD 3110. Racquet Sports**2 Credits (2)**

Knowledge and skills related to the racquet sports of tennis, badminton, and pickleball with emphasis on developmental strategies and skill performance that influences pedagogical content knowledge. Administrative issues will be addressed.

SPMD 3120. Theory and Technique of Lifelong Outdoor Leisure Activities**2 Credits (2)**

Knowledge and skills related to lifelong outdoor leisure activities, including the examination of environmental science and awareness, kinesiology, and fundamental motor skills.

SPMD 3130. Theory and Technique of Sports and Games**2 Credits (2)**

Knowledge and skills related to team sports and games, with emphasis on developmental strategies and skill performance that influence pedagogical content knowledge. Administrative issues will also be addressed.

SPMD 3140. Designing Student Centered Afterschool Physical Activity Clubs**3 Credits (3)**

Knowledge, skills and field based practical application for creating student centered and student designed after school physical activity clubs.

SPMD 3150. Theory and Technique of Dance and Rhythms**2 Credits (2)**

Knowledge and skills related to dance and rhythms, with emphasis on the analysis of dance elements and its role in physical education.

SPMD 3160. Elementary School Physical Education**3 Credits (2+2P)**

Methods for teaching physical education at the elementary level. Primary focus on creating a learning environment for the acquisition and enhancement of developmentally appropriate locomotor, manipulative, and nonmanipulative skills. Field experience included. Consent of Instructor required.

Prerequisite: GPA of 2.5.

Learning Outcomes

1. All course objectives are linked to the InTASC Teaching Standards
2. Improve your knowledge of K-5 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person (Standard 4 j, k, l, n, o; Standard 5 i, Standard 6 j; Standard 7 g, k, l; Standard 8 l; Standard 9 o).
3. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences. (Standard 1 a, b, d, e, h, i; Standard 2 a, b, c, g, e; Standard 4 j, m, n, o; Standard 5 j, k; Standard 9 a, c, h, l)
4. Improve your ability to design and teach developmentally appropriate K-5 physical education curriculum for diverse learners. (Standard 1 a, b, d, e, h, j; Standard 2 a, b, c, d, f, g, h, j, k, l, m; Standard 4 b, c, d, e, f; Standard 5 b, d, h, r; Standard 7 a, b, c, d, e, g, h, j, k, l, n, q)
5. Improve your knowledge of, and ability to, teach a variety of manipulative, nonmanipulative and locomotor skills and concepts. (Standard 7 a, b, c, d, e, g, h, j, k, l, n, q; Standard 8 l)
6. Improve your ability to teach using a variety of strategies such as cooperative learning, problem-based learning, direct instruction, etc. that facilitate learning (Standard 8 a, b, d, e, f, h, l, j, k, l, m, n, s)

SPMD 3210. Anatomy and Physiology II**3 Credits (3)**

Detailed study of the structure and function of the human endocrine, immune, digestive, reproductive, integumentary, central nervous and renal systems. Designed specifically for students interested in allied health professions.

Prerequisite: SPMD 2210 or consent of instructor.

Learning Outcomes

1. Students will demonstrate knowledge through testing, practical skills and demonstration an understanding in visceral anatomy and physiological functioning.

SPMD 3210L. Anatomy and Physiology II Lab**1 Credit (1)**

The students will develop skills in palpating various bony landmarks as well as origins and insertions of major soft tissues. In addition, problem based learning scenarios will be used to complement the SPMD 3210 lecture material and thereby further students understanding of certain physiologic systems including neural, digestive, reproductive, endocrine, and integumentary.

Prerequisite: SPMD 2210; SPMD 2210L; or approved transfer equivalent.

Learning Outcomes

1. To demonstrate through practical application and demonstration a comprehensive understanding of visceral operations and diseases.

SPMD 3250. Introduction to Exercise Science: Exercise Physiology and Biomechanics**3 Credits (3)**

This course serves to provide a broad introduction to both the physiology of exercise and the mechanics of human movement. The conceptual framework of the course will allow for the development of a broad knowledge base regarding these concepts and the latter portions of the course will focus on real world application of the concepts.

Learning Outcomes

1. Students will learn a basic introduction to both exercise physiology and biomechanics and be able to demonstrate their knowledge of the introductory topics by providing real world examples.

SPMD 3310. Lifetime Activities**2 Credits (2)**

Knowledge and skills related to the lifetime activities of swimming, weight training, and other fitness promoting activities with emphasis on learning progressions.

Prerequisite: GPA 2.5.

Learning Outcomes

1. All course objectives are linked to the InTASC Teaching Standards
2. Improve your ability to design and teach developmentally appropriate fitness lesson plans for diverse learners (e.g. aerobics, yoga, strength training). (Standard 7 a, b, c, i, j Standard 8 a, b, d)
3. Improve your ability to modify instructions, lesson plans and tasks based on students' strengths and needs. (Standard 1 b, Standard 3 e, Standard 7 b, c, i, j, l, Standard 8 a, b, d)
4. Improve your knowledge of, and ability to teach a variety fitness content (Standard 7 a, g, h, k, l, n)
5. Improve your ability to plan effective lesson plans to insure equity and sensitivity to students with diverse characteristics. This includes structuring a safe, educational environment that facilitates learning for all students. (Standard 3, e, Standard 7 q, i)
6. Improve your ability to use self-assessment and peer-assessment to reflect on your teaching and plan for adaptations/adjustments (Standard 8 b, d, Standard 9 g).
7. Improve your ability to evaluate and modify instructional resources and curriculum to better meet the needs of their students. (Standard 4 f, Standard 7 g, Standard 8 a)

SPMD 3350. Inferential Statistics in Sport and Exercise Science**3 Credits (3)**

Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course

Learning Outcomes

1. Upon successful completion of this course the student will be able to competently assess exercise data using a variety of techniques that include measures of central tendency, variability, distributional assessments, correlation, regression, and mean testing (t-test and ANOVA).

SPMD 3410. Exercise Physiology**3 Credits (3)**

Basic physiological principles as they apply to exercise and fitness programs. Laboratory experiences included. Requires 2.75 GPA.

Prerequisite: SPMD 2210 or SPMD 2250; GPA 2.75.

Learning Outcomes

1. To gain knowledge of the structure and function of the body systems (muscle, cardiorespiratory, etc.).
2. To gain knowledge related to the body system in reference to acute bout of exercise (responses), as well as following chronic exposure to exercise (adaptions).
3. To understand laboratory procedures used to study the body system.
4. To be able to integrate knowledge related to the function of each system and apply this information to humans undergoing exercise training.

SPMD 3450. Biomechanics**3 Credits (3)**

The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement.

Prerequisite: SPMD 2210 and GPA of 2.75.

Learning Outcomes

1. Learn the basic anatomical, kinematic, and kinetic concepts
2. Learn how the human body generates mobility
3. Learn the kinematic concepts, laws, and principle that govern the human body motion
4. Learn the kinetic concepts laws, and principle that govern the human body motion
5. Learn the forces acting on the body in a fluid and how the human body motion is affected
6. Learn how to utilize the principles and concepts to solve problems

SPMD 3450L. Biomechanics Laboratory**1 Credit (1)**

This course serves to provide an introduction to human movement and its analysis. The conceptual framework of the course will allow for the application of anatomical, mechanical, and electrical concepts in order to better understand the fundamental nature of movement.

Prerequisite: SPMD 2210; GPA 2.75.

Learning Outcomes

1. Use physical laws of motion to quantitatively analyze human performance.
2. Use physical descriptors of movement to qualitatively analyze human performance.
3. Apply principles of kinetics kinematics to solve problems of human motion.
4. Gain exposure to the various data collection and analysis tools in biomechanics.
5. Apply critical thinking skills to problem solving and writing assignments.
6. Use teamwork to complete an experimental motion analysis projects.

SPMD 3550. Psychology of Sport**3 Credits (3)**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles.

Prerequisite: GPA 2.75.

Learning Outcomes

1. Identify psychological characteristics associated with peak performance
2. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
3. Recognize and define the psychological constructs of –for example but not limited to–concentration, confidence, motivation, stress/anxiety, and arousal
4. Understand how personality attributes and the environment affect human performance and injury rehabilitation

SPMD 3610. Health and Exercise Psychology**3 Credits (3)**

The course examines the reciprocal relationship among physical activity, exercise behavior, and psychological determinants associated with adopting and maintaining an exercise program. Topics include theories of behavioral change, exercise psychology interventions, the benefits/pitfalls of exercise, and psychological factors influencing patient rehabilitation.

Prerequisite: GPA 2.75.

SPMD 3650. Motor Development**3 Credits (3)**

Covers development of motor skills from infancy through maturity. Focus on the principles of motor development, early motor behavior, stage theory, and assessment. Field experiences will augment lecture and readings.

Prerequisite: GPA 2.5.

SPMD 3710. Motor Learning**3 Credits (3)**

An examination of the theoretical foundations and related literature that underline the learning, performing, and retention of motor skills with implications for effective teaching and coaching.

Prerequisite: GPA 2.5.

Learning Outcomes

1. Assess functional differences between motor skill types
2. Compare motor control theories and how they control human movement.
3. Critically evaluate current research in motor learning
4. Assess practice schedules and provide recommendations on how practice might be improved in both therapy and sport settings.
5. Compare the pros and cons for retention and transfer testing.
6. Examine the influence of attention on skill performance and debate the role of attention on motor skill preparation

SPMD 4010. Orthopedic Examination, Evaluation and Diagnosis of Upper Extremity Injuries**4 Credits (3+1P)**

Examines normal human anatomy, mechanisms of athletic injury, and deviation from normal anatomy following athletic injury to the upper extremity. Must maintain a 3.0 GPA. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the upper extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patients' overall health and quality of life.

SPMD 4015. Therapeutic Exercise**3 Credits (3)**

The physiological effects, indications, contraindications, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. Must maintain a 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Apply appropriate clinical reasoning to the selection of therapeutic exercises based upon evidence-based practice guidelines, relevant physical findings, indications, contradictions and precautions.
2. Demonstrate appropriate application of therapeutic exercises and techniques including selection, application, patient instruction, and documentation.
3. Design an individualized therapeutic exercise program incorporating appropriate modifications for tissue repair timelines, physiological and psychological factors, and any additional clinical findings.
4. Demonstrate effective assessment skills to determine safe levels of physical activity for patients.

SPMD 4020. Orthopedic Examination, Evaluation and Diagnosis of Core, Spine and Head Injuries**3 Credits (3)**

Advanced clinical assessment techniques and applications. Must maintain at least a 3.0 GPA. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Students will incorporate advanced clinical reasoning skills and apply clinical prediction rules as appropriate.
2. Interpret and apply physical examination findings for appropriate treatment or referral.
3. Apply clinical knowledge for diagnosing injuries and illness of the core, spine, head, and face.
4. Implement prevention guidelines associated with sudden death and catastrophic injury in athletics.

SPMD 4025. Pharmacology in Athletic Training**2 Credits (2)**

An introduction to general medical conditions and pharmacological applications in the athletic training setting. Emphasis on the laws governing the development and distribution, indications, contraindications, precautions, and interactions of prescription and over-the-counter medications. Must maintain a 3.0 GPA. May be repeated up to 2 credits.

Learning Outcomes

1. Describe the principles of pharmacology as they relate to the field of sports medicine.
2. Demonstrate the uses and abuses of drugs in sports.
3. Formulate a philosophical and ethical base of thinking in reference to the field of athletic training as it relates to pharmacology.
4. Describe federal, state and local laws, regulations and procedures for proper storage, disposal, transportation, dispensing and documentation for prescription and nonprescription medications.

SPMD 4030. Organization and Administration in Athletic Training**3 Credits (3)**

An introduction to management, leadership, financial strategies, professional development and legal issues related to the athletic training setting. Must maintain 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate mastery of health care management concepts
2. Demonstrate comprehension of legal and ethical issue in Athletic Training and healthcare management.
3. Construct policies and procedures relevant to running an athletic training clinic or organization.
4. Demonstrate basic concepts of management including distribution of financial resources, inventory and athletic training facility design/evaluation.
5. Summarize appropriate human resources policies relevant to athletic training staffing.

SPMD 4090. Clinical Practicum V**3 Credits (3)**

Athletic training psychomotor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Must maintain a 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Utilize critical thinking skills and apply relevant clinical evidence in the evaluation, treatment and rehabilitation of athletic injuries of the upper extremity.
2. Perform a comprehensive evaluation of the upper extremity to include the shoulder, elbow, forearm, wrist and hand; and then design a specific plan of treatment, and rehabilitation program for injuries and conditions of the upper extremity.
3. Demonstrate an understanding of the referral process as warranted in situations dealing with athletic injuries.
4. Demonstrate an understanding of professional communication as it relates to rehabilitation, plan of care documentation and the referral process.
5. Demonstrate an understanding of the time commitment needed to perform as an ATC by completing the clinical hours required for this course.

SPMD 4093. Clinical Practicum VI**3 Credits (3)**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students might complete a general medical rotation with this course. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Recognition of general medical conditions including emergent physical and psychological conditions for intervention, referral or return to play criteria as appropriate.
2. Demonstrate proper clinical examination techniques for the assessment of general medical conditions including signs and symptoms of catastrophic and emergent conditions.
3. Develop and implement prevention strategies for at-risk individuals and large groups.
4. Demonstrate professional communication skills as related to athletic training including both written and verbal communication.
5. Define and utilize evidence-based practice in the clinical decision making process.

SPMD 4095. Clinical Practicum VII**3 Credits (3)**

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students may complete a general medical rotation as part of this course. Must maintain 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Be prepared to sit for the Board of Certification (BOC) examination.
2. Confidently understand the BOC exam format, and method of delivery.
3. Meet the requirements to maintain certification, including evidence based practice requirements and continuing education units and their reporting cycles.
4. Demonstrate competence in the following educational content areas for the practice of Athletic Training: evidence-based practice, prevention and health promotion, clinical examination and diagnosis, acute care of injury and illness, therapeutic interventions, psychosocial strategies and referral, healthcare administration, professional development and responsibility.

SPMD 4098. Advanced Athletic Training I**1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainer's Association Education Council. May be repeated up to 9 credits.

Learning Outcomes

1. Describe an advanced clinical setting.
2. Demonstrate advanced clinical reasoning skills.
3. Demonstrate advanced clinical competence in one or more of the domains as described by the National Athletic Trainers Association Education Council.

SPMD 4210. Advanced Exercise Physiology**3 Credits (3)**

Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences.

Prerequisite: SPMD 3410 and GPA of 2.75 or consent of instructor.

Learning Outcomes

1. Fundamental concepts about nutrition and its application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 4250. Principles of Strength and Conditioning**3 Credits (3)**

Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. Requires SPMD 2250 or SPMD 3410; GPA of 2.75.

Prerequisite: SPMD 2250 or SPMD 3410; GPA 2.75.

Learning Outcomes

1. Examine both applied and theoretical practices implemented towards various strength and conditioning concepts based on National Strength and Conditioning Association (NSCA) guidelines.
2. Discuss various acute and chronic adaptations to the above said applied and theoretical practices to include, but not limited to, musculoskeletal adaptation, muscular power output, speed and agility characteristics, plyometric training, body composition characteristics, and cardiovascular characteristics, among many others.
3. Recognize strength and conditioning adaptations regarding special populations, such as youth, female, and elderly populations.

SPMD 4250L. Principles of Strength and Conditioning Laboratory**1 Credit (2P)**

An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors. GPA of 2.75.

Prerequisite: SPMD 2250 or SPMD 3410; GPA 2.75.

Learning Outcomes

1. Examine applied practices towards various human performance concepts based on National Strength and Conditioning Association (NSCA) guidelines.
2. Assess various physiological adaptations to the above applied practices, including muscular hypertrophy, muscular power output, speed and agility drills, plyometric training, body composition assessment, and non-traditional training modes, among numerous others.
3. Demonstrate proficiency towards proper administration of performance assessments and exercises to participants of various skill levels as well as possess the capability of instruction and demonstration of said assessments and exercises

SPMD 4350. Exercise Testing and Prescription**3 Credits (3)**

This combined lecture and lab class introduces students to the scientific basis for and principles of exercise testing and prescription. The focus is on basic approaches to exercise testing and prescription for healthy adults, while application to some special populations with chronic disease will be discussed.

Prerequisite: SPMD 3410 or consent of instructor; GPA 2.75.

Learning Outcomes

1. Examine the appropriate administration of exercise tests for the assessment of health-related and performance-related fitness.
2. Apply principles pertaining to appropriate exercise prescription for the general population of healthy adults.
3. Analyze the psychological determinants of appropriate exercise programming.
4. Demonstrate the ability of proper diagnosis and interpretation towards a standard 12-lead ECG reading, including heart rates, heart rhythms, and common arrhythmias.
5. Assist every course participant in the preparation processes to sit for any of ACSM's credential-based exams.

SPMD 4410. Exercise for Special Populations**3 Credits (3)**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions.

Prerequisite: SPMD 3410 or consent of instructor; GPA of 2.75.

Learning Outcomes

1. Pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. Diagnostic testing of various diseases.
3. Medical management of various diseases.
4. Exercise testing and prescription for a variety of chronic disease states

SPMD 4450. Pathophysiology and Human Function(s)**3 Credits (3)**

Students will discuss basic concepts of pathophysiology such as inflammation & repair, infectious diseases, neoplasms, and diseases of specific physiological systems. In addition, students will discuss a variety of case studies, and in so doing will be able to relate pathophysiologic conditions to symptoms, activity restrictions and disability.

Prerequisite: SPMD 2210; SPMD 2210L; SPMD 3410; GPA 2.75.

SPMD 4510. Neurophysiology and Human Function**3 Credits (3)**

Students will discuss neurological control of human movement. Topics will include central and peripheral nervous system functions, with particular emphasis given to somatosensory afferent and motor efferent control. In addition, students will develop an understanding of the techniques employed to assess neurologic function in various patient populations.

Prerequisite: SPMD 2210; SPMD 2210L; SPMD 3410; and GPA of 2.75.

SPMD 4520. Adapted Physical Education**3 Credits (3)**

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student.

Learning Outcomes

1. Students will learn to implement principles of inclusion into the practice of physical education.

SPMD 4530. Methods of Teaching Secondary Physical Education**6 Credits (6)**

Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of Instructor required.

Prerequisite: SPMD 3160.

Learning Outcomes

1. Improve your knowledge of 6-12 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person
2. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences
3. Improve your ability to design and teach developmentally appropriate 6-12 physical education curriculum for diverse learners

SPMD 4550. Exploring Extreme Human Performance**3 Credits (3)**

A reading, writing and documentary based course studying human's quest and the related sacrifices associated with participating in extreme performance activities such as the Olympics, wakeboarding, snowboarding, military special forces, ultra-run events, marathons, etc. Consent of Instructor required.

Prerequisite: Consent of instructor and GPA 2.75.

SPMD 4610. Research Seminar**3 Credits (3P)**

Capstone course for Kinesiology/Pre-Health minors. Consent of Instructor required.

Prerequisite: GPA 2.75.

Learning Outcomes

1. The Student Learning Outcomes are dependent on instructor and specific direction of course with individual group of students, similar to an independent study/research/practicum experience

SPMD 4805. Emergency Response**2 Credits (2)**

Comprehensive approach to the identification of risk factors, preparation of emergency action plans, and recognition and care of emergency medical conditions including those that may lead to sudden death. This is a hybrid course combining online instructional components and clinical skills experience including clinical safety (blood-borne pathogens, ECC, first-aid, etc), and on-field emergency management. Consent of Instructor required.

Learning Outcomes

1. Identify the individuals involved in the Emergency Response Team
2. Construct the components of an effective Emergency Action Plan.
3. Assess the scene and patient during an emergency situation.
4. Demonstrate proper universal precautions and wound care.
5. Demonstrate effective Cardiopulmonary Resuscitation, AED use.
6. Demonstrate effective Rescue Breathing Airway Management techniques.
7. Demonstrate effective splinting techniques.
8. Demonstrate understanding of the techniques utilized in cervical stabilization
9. Identify components of acute care for general medical and orthopedic emergencies

SPMD 4997. Problems**1-3 Credits (1-3)**

Independent study in either Kinesiology and/or Athletic Training May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPMD 4998. Internship**6 Credits (6P)**

A part-time internship in an approved wellness, fitness, athletic, recreation, research lab or other program as agreed upon by the internship supervisor. The student will gain experience in all phases of management and operation. This is a 6-hour internship which can be repeated for an additional 6-credit hours at the same or a different location allowing the student to gain one or multiple field experiences. Field instructor supervision will oversee the students performance. This internship may require relocation to a site outside of the Las Cruces area.

Learning Outcomes

1. Students will apply their academic program didactic knowledge, skills and abilities at a professional site gaining hands-on learning experiences under the supervision of a practicing professional
2. Students will learn in a working environment such that the internship becomes the capstone of their undergraduate education allowing them practical experience in a career field of their choice.

SPMD 5005. Foundations of Athletic Training**3 Credits (3)**

This course provides an introduction to clinical decision making and covers standard techniques and procedures for the evaluation and diagnosis of musculoskeletal injuries and common illnesses, injury prevention concepts, documentation and management. Consent of Instructor required.

Learning Outcomes

1. Demonstration of clinical decision making skills
2. Articulation of standard techniques and procedures for evaluation and diagnosis
3. Produce standardized documentation of clinical findings.

SPMD 5010. Clinical & Functional Anatomy in Athletic Training**2 Credits (2)**

This course allows students to develop applied knowledge and hands-on skills for future athletic training practitioners. Emphasizes skills for identifying musculoskeletal structures visually and via palpation, and then assessing their function. Use of anatomical and live human models to develop and demonstrate skills. Acceptance into the MSAT program.

Learning Outcomes

1. Demonstrate knowledge of human musculoskeletal structures and function.
2. Identification of bony landmarks for assessment of musculoskeletal conditions.
3. Demonstrate appropriate palpation of muscles, bones and joints for musculoskeletal assessment.
4. Demonstrate knowledge of actions, origins, insertions and innervations of the major muscle groups of the human body.
5. Demonstrate appropriate techniques for assessment of functional movements.

SPMD 5015. Graduate Athletic Training Seminar II**1-3 Credits (1-3)**

Advanced seminar topics in athletic training. Students will explore more specialized topics within the field of athletic training under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program. Students should be prepared to further explore topics previously covered in SPMD 5310 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas. Students may explore athletic training topics within the classroom or independently through designated resources. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5020. Graduate Athletic Training Research I**1-3 Credits (1-3)**

Advanced research topics in athletic training. Students will explore research and evidence based practices within the field of athletic training. Students will work under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program faculty member. Students should be prepared to further explore research topics within a specific discipline with the intent of disseminating and sharing information with the athletic training community. topics previously covered in SPMD 5310 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in assessing and conducting research for the athletic training community

SPMD 5025. Graduate Athletic Training I**1-3 Credits (1-3)**

Advanced clinical experiences and education in athletic training. Students will examine topics in athletic training in conjunction with faculty members within the Commission on the Accreditation of Athletic Training Education (CAATE) Athletic Training Program at New Mexico State University . Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5030. Graduate Athletic Training II**3 Credits (3)**

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5050. Clinical Education I**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice. Consent of Instructor required.

Learning Outcomes

1. Demonstrate basic evaluation, taping, bracing and emergency care skills.
2. Select and properly fit protective equipment for a variety of injury and sport scenarios.
3. Demonstrate proper equipment removal for emergency care of the injured athlete.
4. Perform a pre-participation examination including physical evaluation, documentation and referral if needed.

SPMD 5120. Lower Extremity Injury Evaluation + Lab**4 Credits (4)**

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the lower extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the lower extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine and apply therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries.

SPMD 5150. Clinical Education II**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 5050.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 5180. Therapeutic Interventions I**4 Credits (3+1P)**

Stud of physical rehabilitation theory and techniques used as therapeutic intervention for orthopedic injuries and conditions.

Learning Outcomes

1. Demonstrate appropriate application techniques for therapeutic modalities to include thermal, electrical, ultrasound and mechanical therapeutic modalities.
2. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
3. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.

SPMD 5205. Evidence Based Practice**2 Credits (2)**

This course investigates the concepts of evidence based practice as it relates to musculoskeletal assessment, diagnosis and therapeutic interventions with a primary focus on clinician- and patient-oriented outcome measures and appropriate referral decisions. Students will explore primary literature focused on clinical questions related to a comprehensive approach to injury evaluation.

Learning Outcomes

1. Define evidence-based practice as it relates to athletic training clinical practice.
2. Explain the role of evidence in the clinical decision-making process.
3. Describe and differentiate the types of quantitative and qualitative research, research components, and levels of research evidence.
4. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
5. Develop a relevant clinical question using a pre-defined question format (eg, PICO= Patients, Intervention, Comparison, Outcomes; PIO = Patients, Intervention, Outcomes).

SPMD 5220. Upper Extremity Injury Evaluation + Lab**4 Credits (3+1P)**

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the upper extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the upper extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patient's overall health and quality of life.

SPMD 5250. Immersive Clinical Experience**3 Credits (3P)**

Integration of clinical competencies during an immersive, supervised, field based experience in athletic training to link theory into practice. May be repeated up to 6 credits.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will be proficient in the day to day operations of an athletic training room.
2. This immersive experience will prepare students for future employment as a full-time athletic trainers.
3. Students will demonstrate skills in all aspects of athletic training including patient-centered care, clinical examination, diagnosis and intervention, prevention, health promotion and wellness and healthcare administration.

SPMD 5280. Therapeutic Interventions II**4 Credits (3+1P)**

A detailed study of the physiological effects, indications, contraindication, dosage, and maintenance of modern therapeutic devices related to the treatment and rehabilitation of orthopedic injuries and conditions.

Prerequisite: SPMD 5180.

Learning Outcomes

1. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
2. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.
3. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
4. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.
5. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.

SPMD 5310. Inferential Statistics in Sports and Exercise Science**3 Credits (3)**

This course serves to provide an introduction to statistical analyses. The conceptual framework of the course will allow for the application of a variety of statistical concepts in order to better understand the nature of data associated with scientific literature publications. Consent of Instructor

Learning Outcomes

1. Upon successful completion of this course the student will be able to competently assess exercise data using a variety of techniques that include measures of central tendency, variability, distributional assessments, correlation, regression, and mean testing (t-test and ANOVA).

SPMD 5350. Principles of Strength and Conditioning**3 Credits (3)**

Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Consent of Instructor

Learning Outcomes

1. Understanding of general physiology and its responses to acute and chronic exercise
2. Understanding of cardiovascular effects of exercise, training and sport
3. Understanding of strength training affects on special populations such as youth, women and the elderly
4. Understanding of musculoskeletal changes from exercise, training and sport
5. Practicality and application of power and strength training
6. Comprehension of training programs and how they pertain to different training aspects
7. Demonstrate principles of plyometrics and training
8. Understand and demonstrate principles of periodization

SPMD 5410. Biomechanics**3 Credits (3)**

The application biomechanical analysis of human movement as it relates to human performance through the use of anatomical, mechanical and electrical concepts. Consent of Instructor

Learning Outcomes

1. The student will be able to competently assess physical anatomy, analyze linear and angular forces, examine gait, understand the relationships between kinetics and kinematics, understand how muscle and bone architecture impact human movement, and be familiar with the utilization of various data collection methods used in evaluating and improving human movement.

SPMD 5450. Exercise for Special Populations**3 Credits (3)**

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Consent of Instructor

Learning Outcomes

1. To develop an understanding of the pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. To provide a medical perspective in the treatment and management of individuals with these conditions in which exercise therapy may be beneficial.
3. To provide a sound understanding of exercise testing and prescription for a variety of chronic disease states.
4. To be able to assess, interpret, and evaluate case studies of diseased individuals and to develop comprehensive rehabilitation programs based on this information.
5. To develop the ability to articulate / present information of various diseases / conditions in a professional manner both formally and in a one on one setting.

SPMD 5510. Psychology of Sport**3 Credits (3)**

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles. Consent of Instructor

Learning Outcomes

1. Identify psychological characteristics associated with peak performance
2. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
3. Recognize and define the psychological constructs of –for example but not limited to–concentration, confidence, motivation, stress/anxiety, and arousal.
4. Understand how personality attributes and the environment affect human performance and injury rehabilitation.

SPMD 5550. Skill Acquisition and Performance**3 Credits (3)**

Behavioral and physiological examination factors that influence the acquisition and performance of motor skills. Consent of Instructor

Learning Outcomes

1. Describe and explain the principles and processes underlying skilled performance
2. Know the factors to consider when diagnosing, designing, and assessing learning experiences
3. Understand the elements of an effective instructional plan for skill acquisition

SPMD 5575. Advanced Motor Development**3 Credits (3)**

Advanced coverage of motor development topics including: Theoretical perspectives of motor development; the sequential, age-related, continuous process of physical growth and maturation; changes in movement behavior from infancy to older adulthood; external influences on development of motor skills; research approaches in motor development. Consent of Instructor

Learning Outcomes

1. Describe the historical progression of motor development within the broader field of kinesiology
2. Explain the various theories and foundational concepts of motor development
3. Understand and apply the processes (social, cognitive, perceptual) involved in motor skill development throughout the lifespan (infancy, childhood, adolescence, adulthood)
4. Identify procedures and methodologies used to assess various aspects of motor development
5. Interpret the supporting literature and research related to the fundamental principles of motor development
6. Apply and transfer the knowledge gained to develop a research proposal to enhance understanding of a motor development topic of interest

SPMD 6005. Athletic Training Research I**2 Credits (2)**

Instruction and development of research skills through the study of published reports and readings in athletic training and related fields. Consent of Instructor required.

Learning Outcomes

1. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
2. Develop skill in utilizing multiple scales for critical appraisal of literature and research studies.
3. Develop a relevant clinical question utilizing a predefined question format and conduct a literature review on the subject.
4. Describe multiple forms of research, research and literature resources and the differences between narrative reviews, systematic reviews and meta analyses.
5. Describe and apply concepts of diagnostic accuracy and clinical prediction rules as they pertain to patient centered care and evidence based practice.

SPMD 6010. Organization and Administration in Athletic Training**2 Credits (2)**

Organization and administration of athletic training services including management, leadership, financial, human resources, facility, information technology and risk management.

Learning Outcomes

1. Students will employ values consistent with the NATA code of ethics for all health care administration actions.
2. Demonstrate knowledge of legal, ethical and risk management concepts in athletic training and health care administration.
3. Demonstrate mastery of a variety of health care management concepts.
4. Demonstrate comprehension of fiscal management strategies, resource management and facility design as it relates to athletic training.

SPMD 6020. Evaluation of the Head, Neck, Spine and Torso**3 Credits (3)**

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the head, neck and spine.

Prerequisite: SPMD 5220.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the head, neck, spine and torso.
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries and illnesses.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patients' overall health and quality of life.

SPMD 6050. Clinical Education III**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 6110. Professional Preparation**3 Credits (3)**

Knowledge and skills for successful pursuit of athletic training credentials, employment and continuing professional competency; emphasis on current topics and issues contributing to the professional preparation of athletic training. Student must be enrolled in their final semester of the MSAT program to enroll in this course.

Learning Outcomes

1. Students will create a profile with the Board of Certification (BOC) in preparation for their BOC Examination
2. Students will analyze their individual strengths and weaknesses through practice examinations in order to prepare for a successful challenge of the BOC Examination
3. Students will demonstrate knowledge of basic human resources policies and procedures and the hiring process for athletic trainers.
4. Students will self-assess professional competence and create professional development plans according to personal and professional goals and requirements

SPMD 6150. Clinical Education IV**3 Credits (3)**

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 6050.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.
3. Students will demonstrate professional behaviors congruent with the ethical standards of the profession of athletic training.
4. Students will develop, implement, and revise policies that pertain to prevention, preparedness, and response to medical emergencies and other critical incidents.

SPMD 6280. General Medical Conditions & Therapeutic Medications**4 Credits (3+1P)**

Pathophysiology, assessment, and appropriate intervention and referral for general medical conditions and disabilities; common diagnostic tests and imaging assessment tools; commonly used therapeutic medications.

Prerequisite: SPMD 5280.

Learning Outcomes

1. Recognition of general medical conditions including emergent physical and psychological conditions for intervention, referral or return to play criteria as appropriate.
2. Demonstrate proper clinical examination techniques for the assessment of general medical conditions including signs and symptoms of catastrophic and emergent conditions.
3. Demonstrate knowledge of common therapeutic medications and the general medical conditions they treat within the fields of athletic training and sports medicine.
4. Demonstrate knowledge of the principles of pharmacology, including pharmacokinetics and pharmacodynamics, as they relate to the fields of athletic training and sports medicine.
5. Demonstrate knowledge of federal, state and local laws, regulations and procedures for proper storage, disposal, transportation, dispensing and documentation dealing with prescription and non-prescription medications.

SPMD 6310. The Social Construction of the Body**3 Credits (3)**

This course will explore how people's health and physical activity experiences and choices are often shaped by cultural narratives and expectations of the male and female body. Designed for graduate students in allied health and physical activity professions

SPMD 6350. Advanced Exercise Physiology**3 Credits (3)**

Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Consent of Instructor

Learning Outcomes

1. Fundamental concepts about nutrition and its application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 6410. Cardiovascular Physiology**3 Credits (3)**

This graduate level course provides an in-depth study of cardiovascular structure and function. The course assumes that students have a strong background in human physiology. Topics include, but are not limited to: cellular structure of the heart and vascular system; cardiac function, including electrophysiology of the heart; vascular function; neurohumoral control of the heart and circulation, organ blood flow, exchange function of the microcirculation; the impact of common cardiovascular diseases on cardiovascular structure and function, and cardiovascular adaptations to chronic exercise. Consent of Instructor

Learning Outcomes

1. The student will demonstrate a comprehensive knowledge cardiovascular structure and function
2. The student will be able to relate common cardiovascular pathophysiology to cardiovascular functional impairments and physical functional limitations.
3. The student will be able to discuss chronic exercise training adaptations on the cardiovascular system and their value as a treatment strategy for cardiovascular diseases.

SPMD 6450. Skeletal Muscle: Structure and Function**3 Credits (3)**

Basic muscle morphology and physiology with molecular and cellular adaptations in skeletal muscle as consequences to varying exercise regimens. Consent of Instructor

Learning Outcomes

1. To gain knowledge of the structure and function of skeletal muscle
2. To gain knowledge related to the skeletal muscle in reference to cellular and molecular responses and adaptations to exercise
3. To understand laboratory procedures used to study muscle metabolism
4. To develop ability to scientifically critique published papers and present them in a professional manner

SPMD 6510. Designing Resistance Training Program**3 Credits (3)**

Detailed study of the physiological concepts associated with designing resistance-training programs for children, women, seniors, athletic performance and rehabilitation. Consent of Instructor

Learning Outcomes

1. Fundamental components associated with resistance training and exercise prescription
2. Compare and contrast isometric, dynamic, variable, isokinetic, eccentric, concentric resistance training
3. Design programs guided by a needs analysis
4. Demonstrate appropriate techniques and implement systems for training
5. Study physiological adaptations of resistance training for women, children, seniors, athletics and rehabilitation
6. Understand anatomical and physiological changes associated with detraining
7. Integrate components and concepts of resistance training for program design (periodization)
8. Explore alternative training programs

SPMD 6710. Project**1-12 Credits (1-12)**

Selected projects for doctoral students. May be repeated up to 12 credits.

SPMD 6750. Kinesiology Research**1-3 Credits (1-3)**

Research to be conducted under the direction of a Kinesiology faculty member. May be repeated up to 15 credits.

SPMD 6996. Special Topics**1-3 Credits (1-3)**

Offered under various subtitles that indicate the subject matter. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPMD 6999. Capstone Project I**3 Credits (3)**

Students will prepare an individualized capstone project.

Prerequisite: SPMD 5205.

Learning Outcomes

1. Varies

SPMD 7000. Doctoral Dissertation**1-18 Credits (1-18)**

Doctoral Dissertation hours to be conducted under the direction of a Kinesiology Faculty. May be repeated up to 18 credits.

Learning Outcomes

1. Varies

STAT-STATISTICS

STAT 371. Statistics for Engineers and Scientists I**3 Credits (3)**

Modern probability and statistics with applications to the engineering sciences.

Prerequisite(s): C- or better in MATH 1521G or MATH 1521H.

STAT 400. Undergraduate Research**1-3 Credits**

Arrangements must be made with supervising professor before registration. May be repeated for a maximum of 6 credits.

STAT 470. Probability: Theory and Applications**3 Credits (3)**

Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.

Prerequisite(s): C- or better in MATH 2530G and C- or better in at least one-300 level Math course.

STAT 480. Statistics: Theory and Applications**3 Credits (3)**

Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.

Prerequisite(s): C- or better in STAT 470.

STAT 515. Probability: Theory and Applications**3 Credits (3)**

Same as STAT 470 with additional work for graduate students.

STAT 525. Statistics: Theory and Applications**3 Credits (3)**

Same as STAT 480 with additional work for graduate students.

STAT 535. Elementary Stochastic Processes**3 Credits (3)**

Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.

Prerequisite: STAT 515 or consent of instructor.

STAT 540. Directed Reading**1-6 Credits**

May be repeated for a maximum of 6 credits. Graded S/U.

Prerequisite: consent of instructor and graduate committee.

STAT 562. Foundations of Probability**3 Credits (3)**

Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.

Prerequisite: MATH 593.

STAT 563. Advanced Topics in Stochastic Processes**3 Credits (3)**

Markov processes, martingales, Brownian motion, the Ito calculus, stochastic differential equations.

Prerequisite: STAT 562.

Learning Outcomes

1. Understand the notion of a stochastic process.
2. Learn the basic properties of special stochastic processes: Markov processes and martingales.
3. Study and assimilate the fine properties of a particular instance of the stochastic process known as Brownian motion that is both a Markov process and a martingale.
4. Understand the application of Brownian motion known the Ito calculus and become fluent in its use.
5. Apply the Ito calculus to study stochastic differential equations.

STAT 571. Continuous Multivariate Analysis**3 Credits (3)**

Theory and applications of the multivariate normal distribution. May be repeated up to 3 credits. Consent of Instructor required.

Prerequisite(s): STAT 525, or consent of instructor.

STAT 572. Linear Models**3 Credits (3)**

Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.

Prerequisite(s): STAT 571.

STAT 581. Advanced Theory of Statistics I**3 Credits (3)**

Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.

Prerequisite: STAT 525 or consent of instructor.

STAT 582. Advanced Theory of Statistics II**3 Credits (3)**

Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.

Prerequisite: STAT 581 or consent of instructor.

STAT 598. Special Research Problems**1-3 Credits**

Individual investigations or consulting programs. Maximum of 3 credits.

SUR-SURVEYING

SUR 143. Civil/Survey Drafting I

3 Credits (2+2P)

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic mapping, contour drawings, plan, and profiles as street/highway layout. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 109 or DRFT 109.

Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil 3D software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting and trigonometry is required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology.

SUR 222. Introduction to Geomatics

3 Credits (2+3P)

Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping.

Prerequisite: A grade of C- or better in MATH 1250G or higher.

Learning Outcomes

1. Perform basic distance and angular measurements.
2. Evaluate the quality of collected measurements.
3. Utilize a measuring tape.
4. Determine a plumb line.
5. Set up a level line.
6. Set up a tripod and total station.
7. Utilize a plumb rod.
8. Understand the role of surveying in civil engineering and construction-related fields.
9. Understand new technologies in surveying.

SUR 285. Precise Digital Mapping

3 Credits (3)

Photogrammetric Mapping Principles, digital sensor including optical cameras, terrestrial, surveying control, IMU & GPS integration, stereo photography, analytical triangulation, orthorectification, precision and accuracy of measurement systems, sUAS (Small Unmanned Aerial Vehicles) applications to geospatial data collection and practical applications project flight/pre planning, sensor platform, FAA regulations and restrictions, introduction to laser scanning systems. Restricted to Las Cruces campus only.

Learning Outcomes

1. Understand the basic principles of photogrammetry.
2. Perform photo measurements and computation.
3. Be able to design aerial surveying projects.
4. Define the basic principles of analytical photogrammetry.
5. Explain the different steps in aerial triangulation.

SUR 292. Legal Principles and Boundary Law I

3 Credits (3)

Fundamentals of real property law; principles of land description; survey evidence and procedure in boundary determination, order of importance of conflicting elements; and liability, ethical and professional principles in boundary surveying; contemporary issues in boundary determination.

Learning Outcomes

1. Understand how the USPLSS was developed and used
2. Be able to locate and identify USPLSS survey monuments
3. Be able to apply single and double proportion methods
4. Be able to subdivide USPLSS sections
5. Be able to read, write and interpret USPLSS legal descriptions

SUR 312. Public Land Survey System Boundaries

3 Credits (3)

Fundamentals of the U.S. Public Land Survey System; rules for the survey of the public lands, field surveys; the rectangular system, corners, monuments, evidence; dependent and independent resurveys, corner restoration; plats and field notes, patents.

Learning Outcomes

1. Demonstrate an understanding of surveying boundary laws
2. Describe procedures for locating real property boundaries
3. Read, interpret and write legal descriptions of real property
4. Perform legal research of case and statutory law
5. Communicate research findings through written and oral presentation

SUR 328. Construction Surveying & Automation Technologies

3 Credits (2+3P)

Construction Surveying Principles: conventional and machine controlled. Layout alignments, grades, various infrastructure, buildings. Understand error identification, common quality control checks and blunder identification. Alignments and station/off set, types of construction layout of infrastructure: roads, bridges, utilities (including subsurface), buildings, industrial; reading and interpreting construction plans, data management, horizontal, vertical and spiral curves, slope staking, machine control basics, applications and data managements. Use of electronic files and liability issues. Layout alignments, grades, various infrastructure, buildings. Ability to understand data integration in automated machine control, work flow processes.

Prerequisite: A grade of C- or better in both, (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G).

Learning Outcomes

1. Acquire the ability to answer test questions on professional surveying exams.
2. Develop the ability to appropriately collect, analyze, interpret and apply surveying and surveying-related data.
3. Develop the ability to recognize, analyze, and solve surveying and surveying-related problems.
4. Develop the ability to work on teams.

SUR 330. Computer Applications of Surveying**3 Credits (2+3P)**

Advanced application of concepts and tools used in the manipulation of geospatial data in a computer environment. Topics include the use of surveying-specific software applications for problem solving, analysis and generation of spatial data products. Advanced programming skills in a high level language are presented and applied. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in the following: (E T 109 or DRFT 109) and SUR 222, and (MATH 1435 or MATH 1511G), and (E T 262 or ENGR 140).

Learning Outcomes

1. Various

SUR 351. Spatial Data Adjustment I**3 Credits (3)**

Theory of random error in observations/measurements. Use of statistics in spatial data analysis, statistical testing, advanced data structures. Emphasis on computer based problem solving and programming to solve spatial data problems.

Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G) and (A ST 311G or MATH 1350G).

Learning Outcomes

1. Acquire the ability to answer questions on professional surveying exams.
2. Acquire a sound and fundamental understanding of the mathematical principles underlying surveying measurements and computations.
3. Develop the ability to appropriately analyze, interpret, and apply survey and survey-related data.
4. Develop the ability to recognize, analyze, and solve survey and survey-related problems.

SUR 361. Geodesy/Geodetic Control Surveying**3 Credits (3)**

Horizontal and vertical control network design and consideration. Understand ellipsoid, geoid, horizontal and vertical datum, coordinates, precise leveling, astronomic, establishment of state plane zones, understanding reporting. Transform data between geodetic Latitude/Longitude, state plane, ground data, perform geodetic computations, ability to design GPS networks utilizing CORS stations, network adjustments. Perform a control survey, process data, adjust network, and prepare control report with Meta-data.

Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G).

Learning Outcomes

1. Define the different coordinate systems and geometric models used to represent the shape of the Earth.
2. Be able to perform surveying computations on the sphere and ellipsoid.
3. Distinguish between the different map projections systems.
4. Explain the effects of gravity in survey measurements, especially in precise leveling.
5. Outline how earth motions affect surveying measurements and the different time systems.
6. Explicitly indicate which of the student outcomes listed in Criterion III or any other outcomes are addressed by the course.

SUR 401. Ethics and Professionalism in Surveying and Mapping**3 Credits (3)**

Ethics as applied to the surveying profession. Includes case studies and problems.

Prerequisite: .

Learning Outcomes

1. An ability to communicate effectively with a range of audiences.
2. An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

SUR 412. Advanced Topics in Boundary Surveying**3 Credits (2+3P)**

Advanced land boundary topics including water boundaries, mineral claims, Spanish and Mexican land grants, state and national boundaries. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in SUR 312.

Learning Outcomes

1. Identify land boundary topics

SUR 450. Senior Project**3 Credits (3)**

Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education. Students must be in Senior Standing to enroll.

Learning Outcomes

1. An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2. An ability to formulate or design a system, process, procedure or program to meet desired needs.
3. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.

SUR 451. Spatial Data Adjustment II**3 Credits (3)**

Rigorous analysis of the theory of observations as applied to spatial data, application of least squares adjustments, ability to perform statistical analysis to determine accuracy of final product, constrained/free geospatial data integration, error ellipses, and pre-analysis of spatial data acquisition procedures.

Prerequisite: A grade of C- or better in SUR 351.

Learning Outcomes

1. Understand the theory of least squares as applied to survey measurements
2. Understand the relevance of weighting survey observations
3. Be able to adjust vertical, horizontal and 3D networks by least squares
4. Be able to transform coordinates between similar coordinate systems
5. Be able to analyze survey errors and detect survey blunders

SUR 452. Spatial Data Integration and Analysis**3 Credits (3)**

Surveying practice under the direction of a licensed, professional land surveyor requiring an approved number of hours. Planned work between the student and the surveyor should be designed to be part of a project that integrates spatial data. An individualized syllabus should be developed collaboratively with the industrial partner and approved by the geomatics faculty. The final deliverable must be certified by the licensed professional land surveyor. A written report by the student is required. Credit is given to past work experience in cases where students can demonstrate that requirements for the practicum are met and should be approved by geomatics faculty.

Learning Outcomes

1. Demonstrate a level of technical competency, based upon completing the requirements of a geomatics technology curriculum.
2. Students are expected to successfully and professionally complete a "real" project. Additionally, student work is employed to assess most of the program's outcomes for program assess.

SUR 461. GNSS Positioning**3 Credits (2+3P)**

Logistics of GNSS data collection, the GPS signal, codes and biases, error sources, differences between relative and autonomous GNSS positioning, code phase carrier phase, DGPS static and RTK surveys. Geodetic and GPS standards and specifications GNSS data processing, network adjustments, and evaluation of spatial data accuracy practical applications of GNSS May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in SUR 361.

Learning Outcomes

1. Outline the relationship of geodesy to satellite positioning systems.
2. Describe the procedure of GNSS surveys.
3. Differentiate between different GNSS surveying techniques.
4. Identify GPS standards and specifications.

SUR 464. Legal Principles and Boundary Law II**3 Credits (3)**

ALTA Surveys and Standards, boundary evidence, order of evidence, Subdivision and Platting Law, Mexican and Spanish land grants, water boundaries, sequential and simultaneous conveyances. Consent of Instructor required.

Prerequisite: A grade of C- or better in SUR 312.

Learning Outcomes

1. Understand and apply rules of evidence as applied to boundary surveys.
2. Understand the differences between original and retracement surveys.
3. Be able to interpret or write advanced legal descriptions.
4. Understand the role of professional liability in boundary surveying.
5. Understand advanced topics in the USPLSS.

SUR 485. Emerging Techniques in Geospatial Technologies**3 Credits (3)**

Hydrographic, Altimetry, Space borne Imaging Systems, Mobile Mapping Systems, Mining and Agriculture Surveying Principles, Ranging technologies and applications such as LiDAR, SAR, and Bathymetry. Principles of terrestrial & airborne laser scanning, point cloud data management & extraction, scan registration and processing, and advanced ranging data acquisition systems. Consent of Instructor required.

Prerequisite(s): Senior standing.

Learning Outcomes

1. Outline the different techniques in mapping seabed.
2. Describe the procedure of LIDAR mapping.
3. Outline the remote sensing technologies used in mapping.
4. Recognize the UAV mapping technologies.
5. Produce surveying products from new technologies in geomatics.

SURG-SURGICAL TECHNOLOGY

SURG 120. Surgical Technology Clinical I**2-4 Credits (6P)**

This is a health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts.

This course is designed to prepare the student to enter the surgical environment. This course provides an introduction to the operating room, observation of surgical procedures, direct participation in the preoperative (pre-op, intra-op, post-op) preparation of individual cases and professional roles and responsibilities of individual members of the surgical team. Direct supervision is provided by the clinical professional. May be repeated up to 4 credits. Students must be admitted into Surgical Technology Program to enroll in this course.

Prerequisite(s): BIOL 2310, BIOL 2210, BIOL 2225, NURS 150.

Corequisite(s): SURG 140, SURG 145.

SURG 140. Introduction to Surgical Technology**4 Credits (4)**

This is an orientation to surgical technology theory, surgical pharmacology and anesthesia, technology sciences and patient care concepts and is designed to prepare the student to enter the surgical environment with entry-level knowledge necessary to understand patient responses to disease, illness, hospitalization, surgical procedures, commonly used pharmacological and anesthetic agents, and legal, moral, and ethical issues that could be encountered in the surgical environment. Restricted to Community Colleges campuses only.

Prerequisite(s): Admission to Surgical Technology Program; BIOL 2310, BIOL 2225, & NURS 150.

SURG 145. Fundamentals of Perioperative Concepts & Techniques**4-5 Credits (3+3P)**

This is an in-depth coverage of perioperative concepts such as aseptic/sterile principles and practice, infectious processes, wound healing and creation and maintenance of the sterile field. This course is designed to prepare the student to enter the surgical environment with entry-level knowledge of aseptic technique principles and practices, the creation and maintenance of the sterile field including equipment, supplies and instrumentation, and basic case preparation and procedures. An introduction to diseases and disease processes that may be displayed by the surgical patient and the patient's bodily responses to disease are also included. May be repeated up to 5 credits.

Prerequisite(s): Admission to Surgical Technology Program, BIOL 2310, BIOL 2210, BIOL 2225, & NURS 150.

SURG 150. Surgical Procedures I**4-5 Credits (3-5+3P)**

This course is an introduction to surgical procedures and its related pathologies. Emphasis on surgical procedures related to general, obstetrics/gynecology, genitourinary, otorhinolaryngology and orthopedic surgical specialties incorporating instruments, equipment. It is designed to prepare the student to function actively in the surgical environment with entry-level knowledge of surgical procedures. This course expands the basic foundation principles and combines the study of common surgical procedures to include anatomy, physiology and pathophysiology. Specific patient care concepts, medications, instrumentation, equipment, supplies and complication related to selected surgical procedures will be discussed. Admission to Surgical Technology Program necessary to enroll in the course.

Prerequisite(s): SURG 140, SURG 145, and SURG 120.

SURG 155. Pharmacology for the Surgical Technology**2 Credits (2)**

This is an orientation to surgical pharmacology and anesthesia and is designed to prepare the student to enter the surgical environment with knowledge necessary to categorize the classification of drugs, calculate drug dosages and identify the therapeutic use, routes of administration, indications, contraindications and adverse effects of pharmacologic agents used in the perioperative setting. This course is the foundation for the acquisition of program specific competencies as identified by the AST Core Curriculum. Restricted to Carlsbad campus only.

SURG 160. Surgical Procedures II**6 Credits (6)**

This is an introduction to surgical procedures and related pathologies. Emphasis on surgical procedures related to thoracic, peripheral vascular, plastic/reconstructive, ophthalmology, cardiac and neurological surgical specialties incorporating instruments. The course is designed to prepare the student to continue to function actively in the surgical environment with entry-level knowledge of more complex surgical procedures. This course expands the basic foundation principles and combines the study of complex surgical procedures to include anatomy, physiology, and pathophysiology. Specific patient care concepts, medications, instrumentation, equipment, supplies, and complications related to specific surgical procedures will be discussed. Realities of clinical practice and concepts of death and dying will also be discussed. Admission to Surgical Technology Program necessary to enroll in the course.

Prerequisite(s): SURG 150, SURG 260.

SURG 230. Professional Readiness**2 Credits (2)**

This course transitions the student into professional readiness for employment, professional readiness for attaining certification and professional readiness for maintaining certification status. Admission to Surgical Technology Program necessary to enroll in the course.

Prerequisite(s): SURG 140, SURG 145, SURG 120, SURG 150, SURG 260.

Corequisite(s): SURG 160, SURG 265.

SURG 260. Surgical Technology Clinical II**4 Credits (12P)**

This is a health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts. Direct supervision is provided by the clinical professional. This course is designed to provide the student the opportunity to function actively in the role as a surgical technologist and health care team member in a clinical setting under the direct supervision of faculty and health care staff. Applications of basic principles and practices combined with a supervised clinical experience participating in common surgical procedures is the focus. Admission to Surgical Technology Program necessary to enroll in the course. Restricted to Community Colleges campuses only.

Prerequisite(s): SURG 120, SURG 140, & SURG 145.

SURG 265. Surgical Technology Clinical III**4 Credits (9P)**

This is a health-related work-based learning experience that enables the student to apply specialized occupational theory, skills, and concepts. This course is designed to provide the student the opportunity to function actively in the role of a surgical technologist and health care team member in a clinical setting under the direct supervision of faculty and health care staff. Refinement and application of basic principles and practices combined with entry-level employment competency expectations is the focus. Preparation for the National Certification Examination for Surgical Technologists is also included. Admission to Surgical Technology Program necessary to enroll in the course.

Prerequisite(s): SURG 260.

TBGD-TRANSBORDER & GLOBAL HUMAN DYNAMICS

TBGD 5110. Introduction to Transborder and Global Human Dynamics**3 Credits (3)**

Overview of current theories, concepts and issues concerning transborder and global human dynamics. Introduction to key debates and areas of inquiry.

Learning Outcomes

1. Develop knowledge of current interdisciplinary scholarship and debates regarding theories, concepts and issues in the study of transborder and global human dynamics
2. Develop skills in critical analysis of key debates and in the oral and written presentation.

TBGD 6991. Research Design in Transborder and Global Human Dynamics**1-6 Credits (1-6)**

Development of individual research projects through critical reflection on debates concerning culturally appropriate methodologies, collaborative work with community partners, and the responsible conduct of research with regard to transborder and global human dynamics.

Learning Outcomes

1. Develop individual research project through identification of main research questions, methods of data collection and analysis, significance to the broader field of transborder and global human dynamics and goals for application of findings in society.
2. Develop skills in the Responsible Conduct of Research and completion of proposals for IRB approval.
3. Develop appreciation for conducting research in collaboration with community partners to address societal needs.

TBGD 6998. Fieldwork and Community Engagement in Transborder and Global Human Dynamics

1-6 Credits (1-6)

Implementation of research projects through field work, individually or in direct collaboration with community partners.

Learning Outcomes

1. Completion of projects designed to collect data individually and /or in collaboration with community partners using a Community-Based participatory Research (SCBPR) framework.
2. Dissemination of findings to the scholarly community as well as community partners and the general public.

TBGD 7000. Dissertation

1-18 Credits (1-18)

Completion of major research project on a significant aspect of transborder and global human dynamics. Dissemination of findings in academic and community forums. Students must have approval of from their doctoral committee to enroll.

Learning Outcomes

1. Completion of a significant and in-depth research project in the area of transborder and global human dynamics.
2. Presentation of findings in academic conferences.
3. Preparation of publishable work from the dissertation research.
4. Dissemination of findings in alternative formats for community partners and the general public.

TCEN-ENVIRONMENTAL/ENERGY TECH

TCEN 101. Energy for the Next Generation

3 Credits (2+2P)

This course will survey a broad range of sources of energy, types of energy, energy storage, and the forms of energy. Students will be exposed to theory in the classroom, laboratory exercises, and field trips to provide them with a solid foundation for all subsequent energy related environmental courses. Crosslisted with: OETS 101.

Prerequisite(s)/Corequisite(s): OETS 118 or MATH 1215. Restricted to: Community Colleges only.

TCEN 105. Building Analyst I

3 Credits (2+2P)

This course is designed to provide the foundational knowledge and expertise necessary for the energy auditor and home performance contractor. Crosslisted with: OETS 105. Restricted to: Community Colleges only.

TCEN 106. Building Analyst II

3 Credits (2+2P)

Designed to prepare the student for the BPI Building Analyst Certification. This course will walk the student through the hands-on process of conducting visual building inspections, diagnostic testing, identifying improvement opportunities, documenting a home's performance and preparing a scope of work. Crosslisted with: OETS106.

Prerequisite(s)/Corequisite(s): TCEN 105 or OETS 105. Restricted to: Community Colleges only.

TCEN 110. Photovoltaic Application

4 Credits (3+2P)

This course will provide an introduction to Photovoltaic (PV) installation. The course will provide instruction on site selection, prep, installation, and maintenance for photovoltaic applications. Students that complete the course and have the opportunity to take the entry level exam with the North American Board of Certified Energy Practitioners (NABCEP) en route to becoming Certified Installers. Restricted to: Community Colleges only. May be repeated up to 4 credits.

Prerequisite/Corequisite: TCEN 101.

Learning Outcomes

1. Write a detailed analysis using a 6-step problem solving approach to an equipment or process problem
2. Categorize and document system malfunctions, which will be discussed during the pass-down period in a production environment
3. Organize relevant training material to be discussed during teamwork training sessions
4. Identify safety hazards associated with electro-mechanical industrial production systems
5. Use a systematic approach to troubleshoot, identify, and perform corrective maintenance procedures in a system
6. Identify the subsystems of an industrial system and their function
7. Demonstrate the startup, operation, and power down programming sequences for an automated system
8. Apply automated troubleshooting programs to locate / identify fault in a production system
9. Evaluate real time statistical process control data (SPC) to determine (+ -) control limit corrections in a production environment 1
10. Identify personal areas in which student may be able to strengthen student's professional skills 1
11. Assess personal "development" paths, which will ensure a constant advancement through evolving technology careers 1
12. Demonstrate required skills for changing or creating and evaluating real time statistical process control (SPC) data associated with an industrial production process/program

TCEN 111. Basic Electrical Principles I, DC Circuits

4 Credits (3+2P)

Course begins with the basics of electricity and DC circuits. Includes categorization of material properties within conductors, semiconductors, and insulators. Gradual progression tackles more complex topics like DC circuit analysis of series and parallel circuits, including Kirchhoff's laws, Thevenin's & Norton's theorems, and superposition. Finally DC combination circuits, magnetism and electromagnetism, generators and motors are covered. Emphasis on safety throughout. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): OETS 104 or MATH 1215. Restricted to Community Colleges campuses only.

TCEN 112. PV Power Generation Design Fundamentals

3 Credits (2+2P)

A study of photo voltaic design basics, photo voltaic (PV) Cells, modules, and system components; electrical circuits; grid-tied/grid-interactive PV system design and sizing for use on homes; solar electric products and applications; and understanding energy conversion from sunlight to electricity, and working with solar conversion equipment. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): TCEN 111 and (OETS 104 or MATH 1215). Restricted to Community Colleges campuses only.

TCEN 113. OSHA 10 Hour Construction Hazard Identifications**1 Credit**

Intended for entry-level participants to provide instruction on a variety of construction safety and health standards. Topics include Introduction to OSHA, Electrical, Ladder, Excavation, Scaffold, and Forklift Hazards, Fall Protection, Materials Handling, Personnel Protective Equipment and Confined Space Entry Hazards. Meets OSHA 10-Hour Requirements.

TCEN 115. Wind Power Generation Design Fundamentals**3 Credits (2+2P)**

Course covers wind turbine module descriptions and functions and wind system installation, operation, and troubleshooting. Additional topics include wind energy harvesting and the conversion process from the generator system to electricity. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): TCEN 111 and (OETS 104 or MATH 1215). Restricted to Community Colleges campuses only.

TCEN 121. Basic Electrical Principles II, AC Circuits**4 Credits (3+2P)**

Course begins with an overview of the primary components of AC circuits, such as resistors, inductors, rectifiers, transformers and capacitors, and then gradually introduces new, more complicated topics like applying AC principles in power generation and generators, motors, parallel and combination circuits, troubleshooting and evaluation of circuit conditions. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): TCEN 111 and (OETS 104 or MATH 1215). Restricted to Community Colleges campuses only.

TCEN 156. Building Envelope**3 Credits (2+2P)**

Designed to prepare the student for the BPI Building Envelope Certification. This course will provide the principles behind building performance testing and the purpose of completing a comprehensive energy audit. Through lecture and subsequent field training, the student will learn how to use building diagnostics to develop a prescriptive plan for enhancing comfort, health & safety, building durability, and energy savings. The student will learn how to outline the follow-up process required after completion of the retrofit. Crosslisted with: OETS156. Restricted to: Community Colleges only.

Prerequisite(s): TCEN 106 or OETS 106.

TCEN 205. NEC for Alternative Energy**4 Credits (2+4P)**

This hands-on course will cover the National Electrical Code specifics concerning photovoltaic installation. Also code compliant wiring of basic electrical systems will be covered. Existing installations will be visited and studied. Restricted to Community College campuses only. May be repeated up to 4 credits.

Prerequisite: TCEN 101 and ELT 105.

Learning Outcomes

1. Identify all code sections relevant to the different types of Alternative energy systems.
2. Locate problems in alternative energy sources and provide solutions to correct them.
3. Student will have a basic understanding of different types of renewable energy and how to apply the NEC to each type of renewable energy source.
4. Explain what types of renewable energies work best for different geographical locations.
5. Students will also gain hands on experience working with solar photovoltaics, wind turbines and solar thermal panels.
6. Effectively present technical information through written communication
7. Accurately perform course specific calculations
8. Work effectively as a team
9. Locate data and information utilizing the NEC and other various sources
10. Interpret information and instructions
11. Identify appropriate governing bodies and associated regulations
12. Assess cost comparisons for different types of energy applications
13. Accurately perform energy production analysis

TCEN 220. Cooperative Experience**1-3 Credits (1-3)**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): MAT 235. **Prerequisite(s):** TCEN 180. Restricted to: TCEN majors. Graded: S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

TCEN 221. Roofing Materials and Methods**3 Credits (2+2P)**

Covers application techniques and estimation of asphalt and wood roofing products and accessories including gutters and flashing. Presents roof penetration, roof loading issues, and energy system installation requirements for mounting photo voltaic or solar thermal systems.

Prerequisite(s): TCEN 112.

TCEN 222. Photo Voltaic Grid Tie Installation**4 Credits (3+2P)**

This is a more advanced course culminating in a PV system-to-grid connection. This course includes gathering site specific data, design, wire type and sizing specific to project, installation of all solar modules and balance of system (BOS) components, and grounding and bonding of system components, all in accordance with the latest NEC. Upon project design approval a system will be commissioned for the grid. Decommissioning will commence after measurements and troubleshooting as directed by the instructor. May be repeated up to 4 credits.

Prerequisite(s)/Corequisite(s): TCEN 121 and TCEN 223. Prerequisite(s): TCEN 111 and TCEN 112. Restricted to Community Colleges campuses only.

TCEN 223. National Electric Code Principles in Relation to Photo Voltaic 2 Credits (2+1P)

Focuses on all sections of the National Electrical Code and local code requirements applicable to photo voltaic electrical installation. A partial list of areas covered is chapters one through four and section 690, "Solar Photovoltaic Systems" of the National Electrical Code.

Prerequisite: TCEN 112.

Prerequisite/Corequisite: TCEN 222.

Learning Outcomes

1. Identify the requirements for safe and practical solar PV installations.
2. Accurately reference, read, and interpret NEC code as it relates to PV installations (Code 690).
3. Present a compelling case of when the PV electricity market will reach "grid~ parity."

TCEN 224. Field Experience**1-3 Credits (1-3)**

Student will collaborate with instructor in proposing, defining, implementing, and analyzing outcomes of a project in the Environmental and Energy fields of study. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: TCEN majors. Restricted to: Community Colleges only.

TCEN 241. Solar Thermal SHW Principles/Installation and Maintenance 3 Credits (2+2P)

Course presents the theory, installation, operation, and maintenance of solar hot water (SHW) systems. Topics include the types of systems to choose, the costs associated with SHW installation and operation, system sizing requirements, batteries and battery chemistry. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): OETS 104 or MATH 1215.

TCEN 246. Building Weatherization & Auditor Fundamentals 3 Credits (3)

Course provides information on how to locate air leaks and identify heat losses or gains through specific testing. Students will learn how to inspect and evaluate building envelopes, mechanical systems, and ventilation systems to determine the safety and energy consumption for each system. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): TCEN 113 and OETS 104.

Corequisite(s): TCEN 221.

TCEN 251. Advanced Photo Voltaic On/Off Grid Installation**3 Credits (2+2P)**

Photo Voltaic advanced topics to include panel racking and installation, battery storage, charge controllers, mechanical integration of arrays on buildings, and key elements involved in choosing a mounting system. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): TCEN 222. Restricted to Community Colleges campuses only.

TCEN 252. NABCEP Entry-Level Exam Review**2 Credits (2)**

Course presents knowledge, key terms, and concepts of photovoltaic systems and solar hot water systems as related to the NABCEP Entry-level exam. This exam is for those wanting to enter the workforce in either solar thermal or solar PV. Scheduling and taking the exam is the responsibility of the student. Consent of Instructor required. Restricted to Community Colleges campuses

Prerequisite(s): TCEN 222.

Learning Outcomes

1. Analyze photovoltaic markets and application trends
2. Complete practice questions for the NABCEP PV Associate Exam
3. Develop a practice of safe work environment as it relates to the installation and maintenance of photovoltaic systems according to OSHA standards
4. Apply electrical concepts to the operation and maintenance of photovoltaic systems and related equipment
5. Apply solar energy fundamentals, i.e. photovoltaic module essentials, system components, system sizing principles, system electrical design, system mechanical design, performance analysis, maintenance, and troubleshooting
6. Pass the NABCEP PV Associate exam with at least 70 percentile.

TCEN 253. Renewable Energy System Troubleshooting and Maintenance 3 Credits (2+2P)

Covers wind, solar and solar thermal system troubleshooting and maintenance topics to include equipment, electrical, and installation problem areas. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): TCEN 251. Prerequisite(s): TCEN 222. Restricted to Community Colleges campuses only.

TCEN 254. Renewable Energy Internship**2 Credits (2)**

Student will receive industry-related renewable energy experiences at an approved industry location. Typical areas of hands-on practices will be installing solar PV, solar hot-water systems, or wind energy systems. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Prerequisite(s): TCEN 112 and 113 and 222.

THEA-THEATER

THEA 1110G. Introduction to Theatre

3 Credits (3)

This course provides an introduction to the study of theatre. Students will examine various components that comprise theatre, such as acting, directing, playwriting, dramaturgy, scenic and costume design, stagecraft, spectatorship, history, theory, and criticism.

Learning Outcomes

1. Define and discuss basic theater terms and concepts.
2. Discuss the fundamental elements of theatre, and the ways in which theatre differs from other art forms.
3. Analyze and critique the elements of a live theatrical production.
4. Identify and describe the roles of various theatre artists including actors, directors, playwrights, dramaturges, and designers.

THEA 1210G. Acting for Non-Majors

3 Credits (3)

This class gives non-majors experience in the depth and craft of the actor's art. Students will learn various terms, techniques, and practices of acting and will demonstrate their understanding in class. Through exercises and improvisations, partnered scenes, and group work, students will be better able to appreciate the work of others as they learn techniques of performing. May be repeated up to 3 credits.

Learning Outcomes

1. Develop fundamental physical, vocal, analytical, and imaginative skills for acting for the stage.
2. Apply fundamental techniques of voice and movement for the stage.
3. Apply principles of play text analysis to understand story, character, and meaning.
4. Gain a better understanding of an actor's approach to goals, tactics, and obstacles.
5. Engage in character creation and development while preparing and performing monologues and scenes.
6. Learn a common vocabulary to help discuss the process of acting.
7. Employ collaborative methods of work with a partner and in groups.
8. Observe and evaluate acting skills of other actors.
9. Increase verbal and physical communication skills which are applicable in any field. 1
10. Develop personal and social responsibility via group work, research and self-reflection. 1
11. Increase confidence and self-esteem via continuous presentations with supportive feedback.

THEA 1221. Beginning Acting

3 Credits (3)

Basic understanding of self-expression through a variety of physical exercises, improvisation, and character study, culminating in scene or monologue work. Restricted to: THTR majors.

Learning Outcomes

1. Apply a common vocabulary that serves as a foundation in acting for the theatre major and minor
2. Communicate effectively in front of an audience, applying learned concepts while exercising freedom and control of voice, body, and imagination
3. Analyze the written character and live performance
4. Provide objective feedback to your classmate's work as well as your own, that supports a greater understanding of our craft while building trust within the collaborative ensemble

THEA 1222. Stage Movement

3 Credits (3)

Physical techniques for the actor to develop kinesthetic awareness and skills in characterization, archetypes, and stage combat. Restricted to: THTR majors.

Learning Outcomes

1. To provide fundamental training in a variety of movement techniques which can be applied to both theatrical performance and physical communication in everyday life.
2. Observation and critical skills will be advanced through class participation and outside assignments
3. Class exercises are aimed at guiding participants to uncover their own creative expression, while working with efficient, healthy body alignment

THEA 1223. The Art of Theatre

3 Credits (3)

This course introduces the variety and scope of theatre professions, the value and goals of the theatre major and an analysis of the art form from script to stage. Restricted to: Required for THTR majors majors.

Learning Outcomes

1. An overview of the history of theatre in the Western world
2. A general understanding of the artistic roles and functions within the theatre industry (including within NMSU Theatre as a model)
3. A strong preparation for independent in-depth script analysis and theatre critique

THEA 1310. Introduction to Costuming**3 Credits (3)**

This course introduces students to basic skills generally used in creating costumes for theatre. During the semester students will be introduced to the costume shop, equipment, supplies, and processes. They will learn the process of sewing a garment and running a stage production.

Prerequisite(s)/Corequisite(s): THEA 1310L. Restricted to: THTR majors.

Learning Outcomes

1. Demonstrate basic hand and machine sewing skills.
2. Use basic costume craft tools and techniques.
3. Analyze fabric selection for the stage.
4. Draft and use patterns.
5. Take body measurements for patterning and construct a costume from those measurements.
6. Combine interpersonal communication skills with costume construction skills.
7. Analyze a script for costume design purposes.
8. Build a garment.

THEA 1310L. Costume Craft Lab**1 Credit (1)**

Class members will assist in construction for productions in a studio environment.

Prerequisite(s)/Corequisite(s): THEA 1310.

Learning Outcomes

1. This laboratory class compliments THEA 1310: Costume Crafts.
2. It gives the student an opportunity to put into practice the skills learned in THEA 1310 as well as be introduced to and participate in the day-to-day operations of the Costume Shop.

THEA 1415. Running Crew I**2 Credits (1+2P)**

Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.

Learning Outcomes

1. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2221. Intermediate Acting: Scene Study and Monologues**3 Credits (3)**

Monologues and scene work, using character and script analysis.

Prerequisite(s):

Prerequisite(s): THEA 1221 or THEA 1210 with C- or above.

Learning Outcomes

1. Students will gain further insight into the craft of acting and the techniques and skills required to present a successful stage performance.
2. Via the presentation of varied scenes and monologues, students will be exposed to a variety of theatrical literature.
3. Via research, students will gain knowledge of successful actors, acting techniques, and career advice.

THEA 2222. Intermediate Acting for Non-Majors**3 Credits (3)**

A continuation of THEA 1210 with an emphasis on monologues, scenes and characterization. **Prerequisite(s):** THEA 1210

Learning Outcomes

1. Apply fundamental techniques of voice and movement for the stage.
2. Analyze a dramatic text and interpret a character and develop the skills necessary to score a script for character development.
3. Perform specific choices to create and perform goal-driven characters.
4. Demonstrate various physical and mental relaxation techniques.
5. Identify internal and external techniques to increase actor's emotional range.
6. Demonstrate sensory exercises and apply this technique to scene work.
7. Articulate and implement key terminology of modern acting techniques.
8. Develop and articulate a basic personal artistic process.
9. Demonstrate the ability to work cooperatively on a creative/interpretative project. 1
10. Begin to develop professionalism and development of a critical eye through practice giving and receiving peer feedback, adherence to deadlines, memorization, flexibility and coachability.

THEA 2310. Stagecraft**3 Credits (3)**

Student will explore basic skills for scenic designers and techniques of set construction for the stage, including building scenery, rigging, painting and properties.

Prerequisite(s)/Corequisite(s): THEA 2310L.

Learning Outcomes

1. Demonstrate a range of technical skills, which will qualify them to assist in the basic technical production of a play.
2. Demonstrate and apply how to safely and competently use hand tools, power tools, electrical, and electronic stage equipment.
3. Analyze the technical aspects of a play in performance.
4. Read and construct scenery from ground plans, elevations, and drawings.
5. Analyze a script from the perspective of a designer, artistic, and/ or technical director.

THEA 2310L. Stagecraft Laboratory**1 Credit (1)**

Class members will assist with construction for productions in a studio environment.

Prerequisite(s)/Corequisite(s): THEA 2310.

Learning Outcomes

1. History of scenic design and the development of present day stage design.
2. How to create and interpret basic scenic ground plans, elevations, and detail drawings.
3. To construct basic scenic structures to include flats and platforms.
4. Various techniques of scenic painting and decorating.
5. The installations of theatre lighting instruments and sound equipment.

THEA 2340. Introduction to Design**3 Credits (3)**

Introduction into our visual world via the language of designers, focusing on collaboration, creative thinking and presentation skills. The varied design professions in theatre and the performing arts will be explored. Restricted to: Required of all THTR Majors.

Learning Outcomes

1. Apply design vocabulary and descriptions when speaking about design.
2. Identify design tools and make choices about where to use them.
3. Apply the foundation information in understanding how design tools work.
4. Apply correct terminology in assessing design and script analysis.
5. Read and understand some of the design documents commonly used in the industry.

THEA 2415. Running Crew II**1 Credit (1)**

Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.

Learning Outcomes

1. To provide students with "hands on" experience participating in being a member of a running crew on a theatrical production.
2. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2421. Vocal Production for the Actor**3 Credits (3)**

Exploration and development of the actor's vocal instrument, including relaxation, projection, diction and articulation.

Learning Outcomes

1. Apply concepts of alignment, relaxation, breath support, resonance, projection, and articulation for your personal and professional benefit.
2. Refine vocal 'problem solving' which will carry into your personal and professional life.
3. Apply vocal concepts to a variety of text in order to understand and appreciate your voice and its capabilities, both intellectually and sensorially.
4. Apply the vocal/speech tools consciously and behavior-ally, as an aid in the search for musicality of the voice in conjunction with truth and believability.

THEA 2993. Theatre Workshop I**0.5 Credits (.5)**

Required for all freshman and sophomore theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. This lab course is designed to create community via group meetings with your peers while providing a platform for our guest artists to present information regarding our profession.
2. As time allows, group discussions and sharing will further the sense of community and collaboration with your peers.
3. This forum also provides an opportunity to discuss and provide feedback for each production in the ASTC season.

THEA 2996. Theatre Topics**1-3 Credits (1-3)**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

Learning Outcomes

1. Varies

THEA 300. Theatre Workshop II**0.5 Credits (.5)**

Required for all junior and senior theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

THEA 303. Theatre History I**3 Credits (3)**

History of theatre and drama from ancient Greece to the English Renaissance.

THEA 304. Theatre History II**3 Credits (3)**

History of theatre and drama from the Restoration to the 20th century. May be repeated up to 3 credits.

THEA 305. Advanced Vocal Production**3 Credits (.3)**

Advanced exploration and development of the actor's vocal instrument. May be repeated up to 3 credits.

Prerequisite(s): THEA 2421.

THEA 306. Script Analysis**3 Credits (3)**

This class is designed to give you tools and specific processes to help you read and break down a text, so that you can make it come alive for audiences in the varied genres of theatre, film and animation.

Learning Outcomes

1. Determine the dramatic structure of a script
2. Write an analysis of a script for production
3. Verbally communicate an analysis of a script for production
4. Analyze a script from a specific perspective such as actor, director, designer, animator, etc.

THEA 307V. Society in Style: Fashion, History and Culture**3 Credits (3)**

History of clothing for theatrical purposes, origins and evolution of period clothing in relation to social, political, and aesthetic factors of different periods.

THEA 308. Creative Writing: Playwriting**3 Credits (3)**

Technique of one-act playwriting, and analysis of dramatic structure.

Crosslisted with: ENGL 308

Prerequisite(s): ENGL 1110G.

THEA 310. Styles in Acting**3 Credits (3)**

Analysis of differing styles of acting through scene work representing various time periods and genres. Consent of Instructor required. May be repeated up to 3 credits.

Prerequisite: THEA 1221 or THEA 1210 with a C- or better.

THEA 311. Acting for Film and Television**3 Credits (3)**

Specific techniques of acting for the camera are explored via hands-on experiential learning and an introduction to the business of the TV/Film industry

Prerequisite(s): THEA 1221 or THEA 1210 or permission of instructor.

THEA 313. Improvisation**3 Credits (3)**

Long and/or short form improvisation techniques in addition to a variety of exercises exploring terminology, character work and the elements of comedy.

Prerequisite(s): THEA 1210 or THEA 1221.

THEA 315. Theatre in New York City**3 Credits (3)**

Students are introduced to the professional world of theatre via productions, speakers, and tours during this travel course. May be repeated up to 6 credits.

Learning Outcomes

1. To gain insight into professional theatre by viewing and reviewing Broadway productions in NYC.
2. To receive information about the business of theatre via guests who are theatre professionals.
3. To become familiar with job opportunities backstage via guided tours of professional theatre spaces in New York.

THEA 317. Musical Theatre**3 Credits (3)**

Acting class focused on developing and refining skills necessary for performing in musicals. May be repeated up to 9 credits.

Prerequisite(s): THEA 1221 or THEA 1210 with a C- or better.

THEA 321V. Modern European Drama**3 Credits (3)**

Masterworks of European drama from the 19th century to the present. Crosslisted with: ENGL 321V.

THEA 322. Dramatic Character**3 Credits (3)**

How characters have been created for the stage from the beginning of theatrical performances in ancient Greece to the present day. Exploring characterization related to dramatic structure, style, and genre, and how dramatic characters differ from those in literary fiction. May be repeated up to 3 credits. Crosslisted with: ENGL 322.

THEA 323. American Drama**3 Credits (3)**

Masterworks of American drama from the 20th century to the present. Crosslisted with: ENGL 323.

THEA 324. Singing for Musical Theatre**3 Credits (3)**

Students will gain an understanding of stronger vocal health, aural skills, and rehearsal practice strategies as they work on musical theatre singing techniques and performances including solos, duets and small groups, and a final public showcase.

Learning Outcomes

1. The ability to practice strong vocal habits in order to independently maintain vocal health.
2. Identify and utilize proper vocal warm-up techniques.
3. Display an improved level of music reading and aural awareness.
4. Analyze and break down a piece of theatrical music into components for focused learning.
5. Perform pieces of music theatre both individually and in a group with increased ease

THEA 329. Studies in Drama**3 Credits (3)**

Subtitles vary. Study of a group of related works of drama, theory, or theatre practice. Crosslisted with: ENGL 329 and FDMA 329.

THEA 330. Special Topics: Variable**3 Credits (3)**

Specific subjects to be announced in the Schedule of Classes.

Learning Outcomes

1. To gain knowledge and/or skill in a specialty area of theatre

THEA 334. Introduction to Stage Makeup**3 Credits (3)**

Basic principles of stage makeup: straight, character, and specialty. Includes study of various products, methods of application, and the effects of lighting on makeup.

THEA 337. Independent Study**1-3 Credits (1-3)**

Students propose and design their own course not covered through regular course offerings under the guidance of faculty. Consent of Instructor required. May be repeated up to 6 credits.

THEA 341. Scene Painting**3 Credits (3)**

Use of historical painting techniques in a project-driven classroom. Projects include 2-D and 3-D work, color mixing and theory, painting scenery, and the use of paint for effects.

Prerequisite(s): THEA 2310.

THEA 343. Costume Patterning**3 Credits (3)**

Basic techniques in the production of flat patterns for modern and period silhouettes including some draping techniques. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Advanced training in costume design; the ability to create an original pattern in order to be able to make a costume item that is original

THEA 345. Costume Practicum**1 Credit (1)**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Costume Shop. May be repeated up to 1 credits.

Prerequisite(s): THEA 1310.

THEA 346. Scenic Practicum**1 Credit (1)**

A practical course intended to provide students additional experience and greater responsibility within the workings of the Scene Shop. May be repeated up to 2 credits. Graded: S/U Grading (S/U, Audit).

Prerequisite(s): THEA 2310.

THEA 347. Lighting Practicum**1 Credit (1)**

A practical course intended to provide students hands-on experience executing theatrical lighting.

THEA 348. Running Crew III**1 Credit (1)**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

Prerequisite(s): THEA 1415.

THEA 349. Running Crew IV**1 Credit**

Students will work on a technical aspect of a production in a rehearsal and performance environment.

Prerequisite(s): THEA 1415.

THEA 352. Costume Design**3 Credits (3)**

Basic principles of costume design, including script analysis, principles of design, drawing and painting.

THEA 353. Scene Design**3 Credits (3)**

Design for the performing arts. Basic design skills and projects to exercise those skills, history of design in the theatre and the designer's role in the production process. Final project includes a finished scene design.

Prerequisite: THEA 2310 or consent of instructor.

THEA 354. Sound Design**3 Credits (3)**

Hands-on training in theatrical sound design and implementation.

THEA 355. Lighting Design**3 Credits (3)**

Basic aspects of theatre lighting, including electricity, color theory, history, and types of lighting instruments.

THEA 356. Theatre Production**1-3 Credits**

Participation in the production of theatrical performances by stage managing, acting, designing, dramaturgy, or directing. May be repeated for a maximum of 6 credits. Graded S/U.

THEA 357. Computer Scenographics**3 Credits (3)**

Project-oriented course teaching basic computer modeling skills. Projects focus on the creation of communication tools designers use in the theatrical process. Students will develop portfolios of completed projects. Consent of instructor required.

Prerequisite(s): THEA 352, THEA 353, or THEA 355.

THEA 360. Creative Drama**3 Credits (2+2P)**

Methods of developing original dramatizations. Emphasis on curriculum problems and teaching techniques in elementary and secondary schools.

THEA 366. Summer Theatre**1-3 Credits**

Experience in professional or academic summer theatre. May be repeated for a maximum of 3 credits. Graded: S/U. Restricted to THTR majors.

Prerequisite(s): Consent of department head.

THEA 384. Stage Management**3 Credits (3)**

Study of stage management techniques and their application to play production. A working knowledge of union rules, and the procedure to facilitate these through proper communication skills.

THEA 395. Directing I**3 Credits (3)**

Study and application of basic stage directing techniques.

Prerequisite(s): THEA 1210 or THEA 1221.

THEA 408. Shakespeare I**3 Credits (3)**

Study in Shakespeare's early poems and plays. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

THEA 409. Shakespeare II**3 Credits (3)**

Study in Shakespeare's later plays. ENGL 408 is not a prerequisite.

Repeatable for up to six credits under different subtitles. Crosslisted with ENGL 409.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

THEA 410. Advanced Acting: Contemporary Methods**3 Credits (3)**

Acting techniques will be explored focusing on current trends in the profession, from Stanislavski, to Hagen to Meisner. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: THTR majors.

Prerequisite(s): THEA 1210 or THEA 1221.

THEA 414. Collaborative Theatre-Making**3 Credits (3)**

This course introduces students to the techniques, skills and practice of the collaborative creation of new theatrical material.

Prerequisite(s): THEA 1221.

THEA 417. Musical Theatre II**3 Credits (3)**

A continuation of THEA 317, allowing for more advanced musical theatre techniques.

Prerequisite(s): THEA 317.

THEA 430. Special Topics**1-3 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

THEA 435. Directed Reading**1-3 Credits**

Directed individualized studies. May be repeated for a maximum of 3 credits.

THEA 439. Senior Seminar**3 Credits (3)**

Course preparing students for professions in and related to the theatre. Restricted to: THTR majors.

THEA 440. Senior Seminar Practicum**1 Credit (1)**

Capstone course preparing students to apply knowledge of theatre arts toward advanced training or career objectives in the discipline. Consent of instructor required.

Prerequisite(s)/Corequisite(s): THEA 439. Restricted to THTR majors.

THEA 450. The Michael Chekhov Acting Intensive**3 Credits (3)**

An intensive overview of the performance techniques attributed to Michael Chekhov, applied to theatrical scenes and presentations. May be repeated up to 6 credits. Consent of Instructor required.

THEA 535. Directed Study**1-3 Credits (1-3)**

For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

TOX-TOXICOLOGY

TOX 361. Basic Toxicology**3 Credits (3)**

Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended. Crosslisted with: ENVS 361. May be repeated up to 3 credits.

Prerequisite: CHEM 1120G or CHEM 1225G and BIOL 2610G or BIOL 2110G.

Learning Outcomes

1. Learn how toxins are absorbed, distributed, metabolized, and excreted from living systems.
2. Demonstrate how metabolism can appreciably alter the toxicity of compounds as well as dictate the resultant toxicity with an emphasis on target organ(s).
3. Explain the specific mechanism(s) of actions of toxins targeting the liver, lung, kidney, and nervous systems.
4. Delineate how certain toxins induce cancer and/or promote the development of cancer.
5. Understand how and why certain plants and animals are poisonous and venomous, specifically linking discrete chemicals or complex mixtures to the resultant toxic manifestation.

TOX 461. Toxicology I**3 Credits (3)**

Introduction to principles of toxicology. Crosslisted with: TOX 361.

Prerequisite(s): (CHEM 1226 or CHEM 1225G) and (BIOL 2610G or BIOL 2110G).

TOX 598. Special Research Programs**1-3 Credits**

Individual investigations, either analytical or experimental. Graded S/U.

UNIV-UNIVERSITY STUDIES

UNIV 300. Preparing for the Graduate Record Examination**1 Credit (1)**

Preparation for taking the Graduate Record Examination including review, test taking strategies and practice for the verbal, quantitative and analytical sections. Graded S/U.

UNIV 350. Peer Education**3 Credits (3)**

Overview of college student development theory and its application to college student learning and peer education. Supervised experience as a peer educator with training in structured group facilitation.

Prerequisite: consent of instructor.

UNIV 361. NMSU Gospel Choir**1 Credit (1)**

Students will gain performance experience and exposure to urban contemporary gospel music. Open to all majors. May be taken for unlimited credit.

UNIV 395. Independent Study**1-3 Credits**

Individualized projects related to the field of learning assistance. May be repeated for a maximum of 3 credits.

UNIV 450. Faculty Led International Travel**1-3 Credits (1-3)**

This is an intensive Faculty Led International Program and earns an additional credit(s) for participation the FLiP. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

UNIV 495. Independant Study**1-3 Credits (1-3)**

Individualized projects related to the field of learning assistance. Taught with UNIV 395.

WATR-WATER UTILITIES

WATR 120. Introduction to Water Systems**3 Credits (3)**

Introduction to and theory of groundwater sources, production, treatment, and distribution.

WATR 130. Wastewater Collection and Basic Treatment Systems**3 Credits (3)**

Introduction to wastewater characteristics, collection, and basic treatment operations.

WATR 140. Applied Water and Wastewater Math I**3 Credits (3)**

Introduction to basic water and wastewater mathematics, flows through distribution networks and collection systems, and fundamentals of flow measurement.

Prerequisite: CCDM 114 N or equivalent.

WATR 160. Systems Maintenance**4 Credits (2+4P)**

Basic tools, equipment, maintenance schedules, chlorinator troubleshooting, and chlorine safety. Hands-on training with valves, pumps, meters and chlorination equipment.

WATR 175. Programmable Logic Controllers**2 Credits (2)**

This course will introduce students to electrical safety, theory, and the function, operations, programming and troubleshooting of the PLC controlling common electrical components utilized in control circuits associated with the water and wastewater industry. Restricted to: Community Colleges only.

WATR 180. Water Chemistry**3 Credits (3)**

Basic chemistry with applications to water and wastewater analysis.

Prerequisite: CCDM 114 N or consent of instructor.

WATR 182. Water Chemistry Analysis**1 Credit (3P)**

Beginning water and wastewater laboratory analysis including gravimetric, volumetric, and quality control techniques.

Prerequisite: CCDM 114 N or equivalent or consent of instructor.

WATR 190. Water and Wastewater Microbiology**3 Credits (3)**

Overview of microorganisms associated with water and wastewater. Growth and reproduction, energy production, and methods of counting.

Prerequisite: WATR 130, WATR 180, or consent of instructor.

WATR 192. Water and Wastewater Microbiological Analysis**1 Credit (3P)**

Introduction to water and wastewater treatment operational tests such as BODs, solids testing, activated sludge control tests, use of microscope, and bacteriological techniques.

Prerequisites: WATR 130 and WATR 182, or consent of instructor.

WATR 200. Internship**3-5 Credits**

On-the-job training/work experience with municipalities or industries, working in water or wastewater treatment plants, high purity water plants, industrial waste plants, distribution systems, or wastewater collection systems. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: Water Technology majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.

WATR 220. Water Treatment Systems**3 Credits (3)**

Theory of water systems operation including surface water treatment, fluoridation, sodium zeolite softening, corrosion control, iron removal, various filtration methods, and overview of SDWA.

Prerequisites: WATR 180 and WATR 182 or consent of instructor.

WATR 222. Water Systems Operation**1 Credit (3P)**

Operations of various water treatment systems including surface water treatment, sodium zeolite softeners, and various filtration methods.

Prerequisite: WATR 220 or consent of instructor.

WATR 230. Advanced Wastewater Treatment**4 Credits (4)**

Calculations and operations involved in wastewater and water reclamation plants.

Prerequisites: WATR 140, WATR 190, and WATR 192, or consent of instructor.

WATR 232. Wastewater Systems Operations**1 Credit (3P)**

Operation of pretreatment, primary, and biological treatment units.

Prerequisite: WATR 230 or consent of instructor.

WATR 240. Advanced Water and Wastewater Math II**3 Credits (2+2P)**

Advanced water and wastewater mathematics. Flow measurement.

Systems head and pump curves.

Prerequisites: WATR 140.

WATR 250. Municipal Systems Management**4 Credits (4)**

Management of water utility systems including laws, finance, records, and safety.

Prerequisites: WATR 120, WATR 130.

WATR 270. Special Topics**1-4 Credits**

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

WATR 275. Certification Review**3 Credits (3)**

Review of water and wastewater plant operations and laws in preparation for state certification exams. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): WATR 120, WATR 130, WATR 140, WATR 160.

WATR 285. High Purity Water Treatment Systems**3 Credits (3)**

Principles of high purity water production including microfiltration, ultra-filtration, reverse osmosis, and deionization.

Prerequisite: WATR 220.

WATR 287. Advanced Water Chemistry Analysis**3 Credits (6P)**

Sampling techniques, analysis, and evaluation of potable water contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods. May be repeated up to 3 credits.

Prerequisite(s)/Corequisite(s): WATR 285. Restricted to Community Colleges campuses only.

WATR 290. Advanced Wastewater Microbiology and Chemistry**3 Credits (3)**

Covers NPDES permits and DMR calculations and reporting; 503 sludge regs, including pathogen and vector attraction reduction and pollutants; wetlands, composting, and wastewater treatment ponds microbiology; activated sludge bulking and foaming microbiology and treatment; and use of selector to remove nutrients and prevent the growth of filamentous bacteria.

Prerequisite: WATR 190, WATR 192.

WATR 292. Advanced Wastewater Analysis**3 Credits (6P)**

Covers sampling techniques, analysis, and evaluation of wastewater contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods.

Prerequisite: WATR 190 and WATR 192.

WELD-WELDING TECHNOLOGY

WELD 100. Structural Welding I**6 Credits (3+6P)**

Development of basic skills in SMAW, OFC, and OFW in accordance with the AWS entry-level welder program.

WELD 102. Welding Fundamentals**3 Credits (2+2P)**

Survey of welding and cutting processes for nonmajors. Classroom instruction and laboratory work with OFC/OFW, SMAW, GMAW, FCAW, and plasma arc cutting.

WELD 105. Introduction to Welding**3 Credits (3)**

Welding practices, procedures, and terminology. Welding safety, equipment types, electrode types in usage, joint design and testing procedures.

WELD 110. Blueprint Reading (Welding)**3 Credits (3)**

Interpretation of prints related to welding. Emphasis on AWS standard symbols for welding, brazing, and nondestructive examination.

WELD 115. Structural Welding II**6 Credits (3+6P)**

Continuation of WELD 100. Emphasis on AWS entry and advanced level welder skills with SMAW, including all-position welding with mild and stainless steel electrodes. Plasma arc and air-carbon arc cutting, metallurgy, heat treatment, and weld defects.

Prerequisite: WELD 100.

WELD 120. Basic Metallurgy**3 Credits (3)**

Properties of ferrous and nonferrous materials. Service conditions and heat treatment of metals related to welding trade.

Prerequisites: WELD 100 or consent of instructor.

WELD 125. Introduction to Pipe Welding**3 Credits (2+2P)**

Pipe fit-up and welding techniques for pipe fitting and pipe weld joint using SMAW, GMAW, GTAW, and FCAW, 2G welding of pipe. Restricted to: Community Colleges only.

Prerequisite(s): WELD 100, WELD 130, and WELD 140, or consent of instructor.

WELD 126. Industrial Pipe Welding**3 Credits (3)**

Enhancement of WELD 125. Development of more advanced pipe welding skills.

Prerequisite(s): WELD 110, WELD 130 and WELD 140.

Corequisite(s): WELD 125.

WELD 130. Introduction to GMAW MIG)**3 Credits (2+2P)**

Development of basic skills with gas metal arc welding (MIG) in accordance with AWS entry-level welder objectives. Wire electrodes, shielding/purge gases, and modes of metal transfer.

WELD 140. Introduction to GTAW TIG)**3 Credits (2+2P)**

Development for basic skills with gas tungsten arc welding (TIG) in accordance with AWS entry/advanced welder objectives. Welding mild steel, tungsten electrode preparation, filler wire selection, and equipment set-up.

WELD 150. Pipe Welding II**3 Credits (2+2P)**

Continuation of WELD 125; with fillet and groove welded joints in a horizontal fixed and 45-degree fixed positions (5-F, 5-G, 6-F, 6-G).

Prerequisite: WELD 125.

WELD 151. Industrial Pipe Welding II**3 Credits (3)**

Enhancement of WELD 150. Development of more advanced pipe welding skills. Emphasis on industry driven test.

Prerequisite(s): WELD 125 and WELD 126.

Corequisite(s): WELD 150.

WELD 160. Introduction to SAW and FCAW**3 Credits (2+2P)**

Submerged arc and flux-cored arc welding. Demonstrations and practice with machine travel submerged arc welding (SAW), flux-cored arc welding (FCAW-G, FCAW-S) on mild steel plate and pipe. Restricted to: Community Colleges only.

WELD 170. Welded Fabrication**3 Credits (1+4P)**

Development of fabrication skills including basic layout, measuring, and utilization of various welding processes including out-of-position welding. Use of common shop tools.

Prerequisites: WELD 100, WELD 110, WELD 130, and OETS 104 or OETS 118.

WELD 180. GTAW II**3 Credits (2+2P)**

Continuation of WELD 140. Development of more advanced GTAW skills. Emphasis on pipe welding with mild steel, stainless steel, and aluminum.

Prerequisite: WELD 140 or consent of instructor.

WELD 190. Welded Art**3 Credits (1+4P)**

Students explore the possibilities of welded art in the form of sculpture, jewelry, furniture and as a framework to support other art media. Offered as an elective for students who wish to create art using welding. May be repeated up to 12 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): WELD 102.

WELD 211. Welder Qualification**6 Credits (3+6P)**

Laboratory and classroom instruction on AWS and ASME Welder Performance Qualification Tests. All position plate and pipe techniques and tests for SMAW, GMAW, GTAW, FCAW, and SAW. Nondestructive and destructive examination methods. Basics of welding codes. Restricted to majors.

Prerequisites: OETS 104 or OETS 118; and WELD 100, WELD 110, WELD 120, WELD 130, WELD 140, WELD 160 and WELD 180 or consent of instructor.

WELD 221. Cooperative Experience I**1-6 Credits**

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U. Restricted to majors.

Prerequisites: WELD 100 or WELD 101 and consent of instructor.

WELD 255. Special Problems in Welding Technology**1-6 Credits**

Individual studies in areas of welding technology. May be repeated for a maximum of 12 credits.

Prerequisite: consent of instructor.

WELD 295. Special Topics**1-4 Credits**

Topics to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

WSAM-WATER SCIENCE & MGT

WSAM 470. Environmental Impacts of Land Use and Contaminant Remediation

3 Credits (3)

The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies. May be repeated up to 3 credits. Crosslisted with: ENVS 470.

WSAM 550. Special Topics

1-4 Credits (1-4)

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.

Learning Outcomes

1. Readings, discussions, and/or field and laboratory investigation of selected problems.

WSAM 551. Earth Data Retrieval

3 Credits (3)

This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: RGSC 551.

WSAM 575. Climate Studies, Water and Society

3 Credits (3)

The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies. Crosslisted with: RGSC 575.

WSAM 585. Land Cover Analysis for Natural Resources

3 Credits (3)

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: RGSC 585.

WSAM 589. Landscape Hydrology Modeling

3 Credits (3)

Understand the landscape scale of hydrologic cycle and related hydrological processes. Quantitatively evaluate hydrological system components. Retrieve, visualize and model some of the physical processes using some of the available tools. Consent of Instructor required.

WSAM 590. System Dynamics

3 Credits (3)

This course takes a system dynamics approach to the study of economics and natural resources management. We will examine some of the example theories such as Solow-Swan model and endogenous growth theories as well as the tragedy of the commons, using system dynamics tools to uncover the feedback and explicitly examine its impact on the dynamic behavior of the system. Through these examples, we will learn how to develop, validate, and use system dynamics models for policy design and analysis. Crosslisted with: RGSC 590.

Learning Outcomes

1. identify common generic structures and behavioral modes in socioeconomic and ecological systems,
2. define important feedback theories that explain the behavioral modes in socioeconomic and ecological systems, and
3. implement the system dynamics method to translate the feedback theories into dynamic simulation models.

WSAM 595. Hands-On Transboundary Aquifer and Community System Convergence Seminar

1 Credit (1)

An opportunity for graduate researchers to build partnerships with their colleagues in the IWR cohort and with our expert collaborators. Graduate researchers present their research methods, share lessons from their research activities, and report on experiences in the field and in the IWR program. An opportunity for academic, industry, and stakeholder project partners to share career development and research convergence insight with the cohort. May be repeated up to 18 credits.

Learning Outcomes

1. Students will learn about natural and social science convergence.
2. Convergence tool skill-building.
3. Students will learn how to lead the coordination of international, multidisciplinary research collaboration.

WSAM 598. Internship

1-9 Credits (1-9)

Out-of-classroom learning experiences to gain relevant education, experience, and expertise. Field-based learning providing transformative education and hands-on training. May be repeated up to 18 credits.

Learning Outcomes

1. Gain the experience necessary to engage confidently in community-centered hydrologic and social science approaches to water research.
2. Students will learn how to lead the coordination of international, cross-disciplinary research collaboration.
3. Gain experience applying academic and research knowledge in professional capacities.
4. Develop cross-sector communication skillsets.

WSAM 599. Masters Thesis

1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits. Consent of Instructor required. Restricted to: Water and Science Management majors. Thesis/ Dissertation Grading.

WSAM 600. Doctoral Research**1-15 Credits (1-15)**

Assigned credit for research performed. May be repeated up to 15 credits.

Consent of Instructor required.

Learning Outcomes

1. Identify appropriate research methodologies.
2. Reflect on their own research, identifying lessons learned, strengths, and ways to improve.
3. Communicate confidently and constructively with faculty advisors.

WSAM 605. Arid Land Water Resources**3 Credits (2+2P)**

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. May be repeated up to 3 credits. Crosslisted with: ENVS 605.

WSAM 610. Water and Sustainable Economic Development**3 Credits (3)**

For graduate students in the Water Science and Management or other research degree programs, use the water economics literature as a model for student research leading to an M.S. thesis or Ph.D. dissertation.

WSAM 700. Doctoral Dissertation**1-15 Credits (1-15)**

Dissertation for Water Sciences and Management Majors May be repeated up to 88 credits. Restricted to: Water Sciences and Management majors. Thesis/Dissertation Grading.

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